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(54) **ROLLING FRICTION OR SUSPENSION FRICTION IMPACT MINING METHOD AND WEAR-RESISTANT IMPACT MINING MACHINE USING SAID METHOD**

(57) A rolling friction or suspension friction impact mining method and a wear-resistant impact mining machine using said method. The mining machine comprises a reciprocating impact part (3). The reciprocating impact part comprises an impact drive device (4), a rolling reciprocating device, and an impact head (6). The rolling reciprocating device comprises a rubbing body (38), a rubbing body support (39), an impact guiding element (5.1), and a position-limiting mechanism. The rubbing body (5.3) are disposed between the robbing body support (39) and the impact guiding element (5.1), and inside of the position-limiting mechanism to form rolling guiding. The impact drive device is disposed with a damage-prevention mechanism, a rotary power buffer device, and a structural buffer device, such that the impact head reciprocatingly move and have rolling or suspending friction

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under the support of the impact guiding element, thereby preventing the damage-prevention force to damage a power drive device and a rolling channel guiding device, and preventing the impact vibration caused by the reciprocating impact part to affect the machine body and other parts. The overall stability is therefore enhanced, and the service life is extended

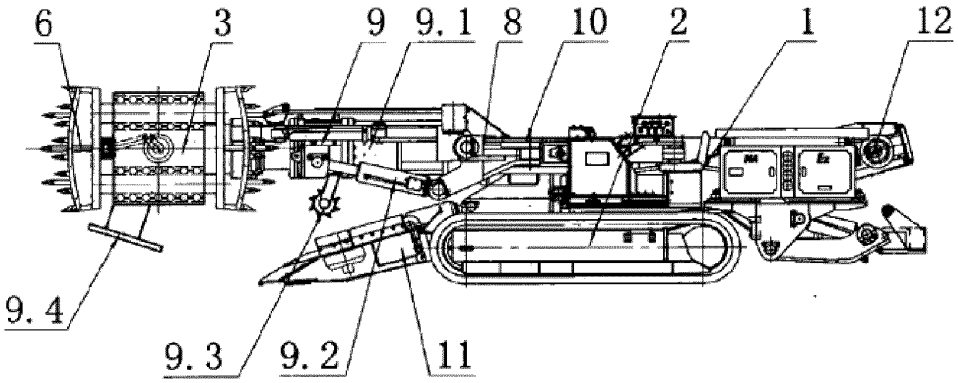


Fig. 4

Description

Technical field of the invention

[0001] The present invention belongs to the mechanical field, and is especially applicable to a rolling friction or suspension friction impact mining method in the mining field and a wear-resistant impact mining machine using said method.

Background of the invention

[0002] Tunneling machines and coal mining machines are mainly applied to excavation of railways, bridges and culverts of roads and tunnels and mechanical mining of ore materials. Most mining machines broadly applied at present are drilling and milling cutting-type tunneling machines and rolling milling cutting-type mining machines and the working principle is to drill and cut or mill and cut in a rolling manner a coalbed or a rockbed through picks arranged on the outer surface at a front part of a cutting head. Since a relatively large rotating damage force is generated by the cutting head during drilling and milling or rolling milling and cutting, a relatively large twisting force will be generated to a rotating shaft, thus causing heavy damage to the rotating shaft and shortening the equipment service life. The crushing efficiency of a drilling milling or milling cutting mining method is relatively high with extremely high energy consumption, and low production efficiency and lumpiness especially when tunneling crushing and ore material mining are performed at a pressure stress. During the mining process, a large amount of dust will be further generated, which results in a poor mining environment and potential risks. In order to overcome various disadvantages of the drilling milling or milling cutting mining method, reciprocating impact mining machines have emerged in the mining field.

[0003] In order to improve the mining efficiency, a cutting head of an existing reciprocating impact mining machine is made as large as possible. When a material is impacted and fallen, since the cutting head of the mining machine is heavy in weight and large in volume, a head handle of the cutting head is seriously damaged from an impact guiding mechanism, thus leading to damage on a drive system and a machine body, massive maintenance of the whole machine and a short service life. However, if the cutting head is narrow and small, the production efficiency will be largely reduced. Therefore, it is in urgent need of an energy-saving and environment-friendly impact mining machine which is high in production efficiency and capable of preventing a cutting head from damaging an impact guiding mechanism with little wear to the impact guiding mechanism, and little damage caused by an impact reactive force on a drive system and a machine body.

[0004] Invention Patent Numbered 201010238402.7 discloses a crushing mechanism for a coal mining device. The equipment is composed of a main body, a power component, a working component and a connecting arm etc. The power component drives the working component to reciprocate and impact linearly to perform coal falling. The power component applies a hydraulic cylinder. There is sliding friction between a piston in the hydraulic cylinder and the cylinder body with large friction resistance, thus causing serious wear to a sealing plug and increasing a gap between the piston and the cylinder body to increasing leakage while increasing energy consumption and affecting the operational performance of the equipment. In the present invention, the hydraulic cylinder is applied to driving the working component to impact at a low speed with a low impact frequency, thus failing to realize a high frequency impact effect of a mechanical transmission mechanism, e.g. a crank mechanism. The working component is installed at an end of the hydraulic cylinder. When the hydraulic cylinder drives the working component to extend out or retract along an axial direction of the hydraulic cylinder, problems including swinging and oscillation etc. of the working component are further caused to affect the impact effect. Since a hydraulic cylinder rod is not provided with an auxiliary guiding device, the working component is seriously damaged from the hydraulic cylinder by a powerful impact reactive force generated during mining. Thus, a sliding frictional force is focused on the hydraulic cylinder to cause partial wear, which results in heavy damage on the hydraulic cylinder and affects normal operation of the equipment.

Summary of the invention

[0005] To solve the problem above, the present invention provides a rolling friction or suspension friction impact mining method in the mining field and a wear-resistant impact mining machine using said method. The method is realized through the following technical solution:

A rolling friction or suspension friction impact mining method, the method is realized by the following steps:

an impact drive device, a guiding device and an impact head etc. are provided; the impact drive device, the guiding device and the impact head etc. are formed into a reciprocating impact part; a power support etc. is provided on the impact drive device; a guiding support etc. is provided on the guiding device; the power support and the guiding support are separated, connected in a separated manner or integrated; a rubbing body support etc. is provided on the power support and/or the guiding support; the rubbing body support and the power support are separated, or connected in a separated manner or integrated, or the rubbing body support and the guiding support are separated, or connected in a separated manner or integrated; a roller support or a suspender support etc. is provided on the rub-

bing body support; the roller support and the suspender support are separated, connected in a separated manner or separated; a guiding roller support and/or a power roller support etc. are/is provided on the roller support; the guiding roller support and the power roller support are separated, connected in a separated manner or integrated; a guiding suspender support and/or a power suspender support etc. are/is provided on the suspender support; the guiding suspender support and the power suspender support are separated, connected in a separated manner or integrated; an impact guiding element, a rubbing body and the rubbing body support etc. are provided on the guiding device; the rubbing body is provided as a roller or a suspender etc.; the roller is provided as a guiding roller and/or a power roller etc.; the guiding roller and the power roller are separated, connected in a separated manner or integrated; the suspender is provided as a guiding suspender and/or a power suspender etc.; the guiding suspender and the power suspender are separated, connected in a separated manner or integrated;

the impact drive device is provided as a crank impact drive device, or a hydraulic impact drive device or a pneumatic impact drive device or a solid flowing impact drive device etc.; a power impact element and the power support etc. is provided on the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device; a cylinder etc. is provided on the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device; the cylinder and the power support or the guiding support are separated, connected in a separated manner or integrated; the impact guiding element and the power impact element are separated, connected in a separated manner or integrated;

the impact guiding element and the impact head are connected in a separated manner or integrated; the power impact element and the impact head are connected moveably, connected separately or integrated; the rubbing body is provided between the guiding support and the impact guiding element, or between the cylinder and the impact guiding element, or between the power support and the power impact element etc.; the rubbing body support etc. is provided on the guiding support, or the cylinder or the power support; the power impact element drives the impact guiding element or the impact head to reciprocate; the rubbing body, the rubbing body support and the impact guiding element etc. are matched closely to support an impact of the impact head through rolling friction or suspension friction;

a frame etc. is provided; the frame thereon is provided or is not provided with a jacking device; the reciprocating impact part is provided on the frame or provided on the jacking device etc.; the frame is provided in a machine body or the frame and the jacking device are combined and provided in the machine body;

the machine body supports the impact head to impact in a reciprocating manner to fall a material;

a travelling part etc. is provided; the travelling part is provided at a lower portion of the machine body; the travelling part drives the machine body to travel.

[0006] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

the rubbing body, the rubbing body support and the impact guiding element etc. are matched closely to support an impact of the impact head through rolling friction or suspension friction and centralize an impact direction of the impact head; the impact drive device is protected by the guiding device from being damaged by damage, thus improving impact efficiency.

[0007] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

one or two ends of the power impact element is provided with a damage-prevention mechanism etc.; the damage-prevention mechanism is provided as a rotating structure or a split structure etc.; the rotating structure or the split structure etc. of the damage-prevention mechanism is used in a matched manner with the guiding device; the rotating structure is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner.

[0008] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

the guiding support etc. is provided on two or more ends of the power support to form two or more guiding support points; the two or more ends comprises spatial positions comprising two or more ends of a guiding support main body or two or more end spatial positions out of the guiding support main body; the two or more guiding support points both support the gravity of the impact head; the rubbing body, the impact guiding element and the rubbing body support etc. are matched closely to form a multi-point support impact head structure; the multi-point support impact

head structure supports the impact head through multiple points to centralize an impact direction of the impact head, thus maximally increasing a centralizing width to the impact head, strengthening centralizing on the impact head, maximally controlling the impact direction of the impact head, preventing the impact drive device from being damaged by an impact damage force and a reactive force, and extending the service life of the device.

[0009] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps: two or more rows of rubbing bodies etc. are provided around one impact guiding element; the two or more rows of rubbing bodies bear a gravitational load of the impact head and/or the impact guiding element; at least one or more rubbing bodies of one row of rubbing bodies support the impact head to impact in a reciprocating manner, thus preventing centralized damage on the rubbing body caused by a gravitational load of the impact head and/or the impact guiding element etc. on only one row of rubbing bodies.

[0010] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

the impact guiding element etc. is provided on the rubbing body support; a liquid suspender or a gas suspender etc. is provided on the impact guiding element or the rubbing body support; or a liquid suspender or a gas suspender etc. is provided on the power impact element or the power support, or a magnetic suspender etc. is provided on the impact guiding element or the rubbing body support, or a magnetic suspender etc. is provided on the power impact element and the power support; the magnetic suspender is provided as an electromagnetic or a permanent magnetic suspender etc.; suspension friction is formed between the impact guiding element and the rubbing body support or between the power impact element and the power support etc. by a suspender; a frictional resistance and frictional damage between the impact guiding element and the rubbing body support or between the power impact element and the power support are reduced by the suspension friction, thus improving the service life of the impact drive device or the guiding device.

[0011] A rolling friction or suspension friction impact mining method according to the Method 6 includes the following steps:

an N pole permanent magnet is provided on the impact guiding element or the guiding support; or an S pole permanent magnet is provided on the impact guiding element or the guiding support; N pole permanent magnets repel each other and S pole permanent magnets repel each other to form a magnetic suspender; the power impact element drives the impact guiding element to reciprocate; the magnetic suspender supports the impact guiding element and the guiding support to reciprocate oppositely with suspension friction; or an N pole permanent magnet is provided on the power impact element and the power support; or an S pole permanent magnet is provided on the power impact element and the power support; an N pole permanent magnet and an N pole permanent repel each other and an S pole permanent magnet and an S pole permanent magnet repel each other to form a magnetic suspender; the magnetic suspender supports the power impact element and the power support to reciprocate oppositely with suspension friction.

[0012] A rolling friction or suspension friction impact mining method according to the Method 6 includes the following steps:

a cathode electromagnet is provided on the impact guiding element and the guiding support, or an anode electromagnetic is provided on the impact guiding element and the guiding support; cathode electromagnets repel each other and anode electromagnets repel each other to form a magnetic suspender; the power impact element drives the impact guiding element to reciprocate; the magnetic suspender supports the impact guiding element and the guiding support to reciprocate oppositely with suspension friction; or a cathode electromagnet is provided on the power impact element and the power support; or an anode electromagnet is provided on the power impact element and the power support; cathode electromagnets repel each other and anode electromagnets repel each other to form a magnetic suspender; the magnetic suspender supports the power impact element and the power support to reciprocate oppositely with suspension friction.

[0013] A rolling friction or suspension friction impact mining method according to the Method 6 includes the following steps:

a gas source, a control valve, a transmission pipeline and a gas cavity etc. are provided; the gas cavity is provided on the guiding device; a gas suspender is formed between the guiding support and the impact guiding element; the gas suspender supports the impact guiding element to reciprocate with suspension friction; or the gas cavity is provided on the impact drive device; a gas suspender is formed between the power support and the power impact element; the gas suspender supports the power impact element to reciprocate with suspension friction.

[0014] A rolling friction or suspension friction impact mining method according to the Method 6 includes the

following steps:

a liquid medium source, a control valve, a transmission pipeline and a liquid cavity etc. are provided; the liquid cavity is provided on the guiding device; a liquid suspender is formed between the guiding support and the impact guiding element; the liquid suspender supports the impact guiding element to reciprocate with suspension friction; or the liquid cavity is provided on the impact drive device; a liquid suspender is formed between the power support and the power impact element; the liquid suspender supports the power impact element to reciprocate with suspension friction.

[0015] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

a position-limiting structure etc. is provided on the reciprocating impact part; the position-limiting structure is provided as a guiding position-limiting structure or a power position-limiting structure etc.;
the guiding position-limiting structure and the rubbing body support are connected, separated or integrated; or the guiding position-limiting structure and the impact guiding element are connected, separated or integrated; or the guiding position-limiting structure and the guiding rollers are connected, separated or integrated; or the power position-limiting structure and the power support are connected, separated or integrated; or the power position-limiting structure and the power impact element are connected, separated or integrated; or the power position-limiting structure and the power rollers are connected, separated or integrated;
guiding rubbing body etc. is provided in the guiding position-limiting structure; the guiding rubbing body supports the impact guiding element to reciprocate along the rubbing body support in the guiding position-limiting structure; the guiding position-limiting structure limits a motion space and a position of the guiding rubbing body and/or the guiding support etc.;
power rubbing body etc. is provided in the power position-limiting structure; the power rubbing body supports the power impact element to reciprocate along the power support in the power position-limiting structure; the power position-limiting structure limits a motion space and a position of the power rubbing body and/or the power impact element etc.;
the rubbing body supports the impact guiding element and/or the power impact element etc. to reciprocate.

[0016] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

a guiding circulating raceway etc. is provided on the impact guiding element or the roller support; the guiding circulating raceway and the impact guiding element or the roller support are connected in a separated manner or integrated; the impact guiding element etc. is provided in the roller support; the guiding rollers etc. are provided in the guiding circulating raceway; one part of the guiding roller exposed out of the guiding circulating raceway is in contact with the surface of the roller support or the surface of the impact guiding element; an impact guiding element main body is not in contact with the surface of the roller support; the guiding rollers support the impact guiding element and the roller support to reciprocate oppositely with rolling friction; or a power circulating raceway etc. is provided on the power impact element or the power support; the power circulating raceway and the power impact element or the power support are connected in a separated manner or integrated; the power impact element etc. is provided in the power support; the power rollers etc. are provided in the power circulating raceway; power rollers exposed out of the power circulating raceway are in contact with the surfaces of the power rollers or the surface of the power support etc.; a power impact element main body is in not contact with the surface of the power support; the power rollers support the power impact element and the power support etc. to reciprocate oppositely with rolling friction.

[0017] A rolling friction or suspension friction impact mining method according to the Method 12 includes the following steps:

the rollers roll in a circulating manner, in a reciprocating manner or in situ etc. in the circulating raceway to support the impact guiding element and the rubbing body support or to support the power impact element and the power support etc. to reciprocate oppositely.

[0018] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

a reciprocating stroke section is provided on the roller support, the impact guiding element, the power support or the power impact element etc.; the rollers are provided between the roller support and the impact guiding element, or between the power support and the power impact element and are provided in the reciprocating stroke section; the reciprocating stoke section limits a rolling space and the positions of the rollers; the rollers and the impact guiding element have rolling friction with the roller support etc. or the rollers and the power impact element etc. have rolling friction with the power support etc. while moving.

[0019] A rolling friction or suspension friction impact mining method according to the Method 14 includes the following steps:

the width of the reciprocating stroke section is not larger than or equal to or close to the width of the rollers in a roller rolling direction; the length of the reciprocating stroke section is equal to or close to the sum of 1/2 of the stroke of the impact guiding element or the power impact element and the roller diameter; the rollers are provided between the roller support and the impact guiding element, or provided between the power support and the power impact element and provided in the reciprocating stroke section; the reciprocating stroke section limits the rolling space and the positions of the rollers; the reciprocating stroke section ensures that the rollers and the impact guiding element have rolling friction with the roller support or the rollers and the power impact element have rolling friction with the power support etc. while moving.

[0020] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

the rubbing body support and the impact guiding element etc. are provided on the guiding device; two ends of the impact guiding element are provided with impact heads or one end is provided with an impact head, or one end is provided with an impact head and the other end is provided with a counterweight element;
a guiding section etc. is provided on the impact guiding element; the guiding section is provided at an impact guiding element with one end provided with an impact head and the other end provided with a counterweight element, or an impact guiding element with two ends provided with impact heads etc.; the setting method is that two ends of the guiding section are equal or substantially equal in weight besides an overlapped section with the impact guiding element;
the guiding section etc. is provided in the rubbing body support; the guiding section is matched with the rubbing body support so that the guiding section is always located on the rubbing body support when moving, thus maintaining gravitational equilibrium of the impact guiding element in a static state or in a moving state;
the rubbing body support, the rubbing body and the impact guiding element etc. are matched closely to support the impact guiding element to reciprocate; the power impact element and the impact guiding element are separated, connected or integrated; the impact head is supported by the impact guiding element to reciprocate; the impact head impacts a coal wall or a rock wall to fall a material.

[0021] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

a rolling wheel etc. is provided between the power support and the power impact element or a rolling wheel is provided between the guiding support and the impact guiding element;
when an axis of the rolling wheel is fixed to the power impact element, the rolling wheel rolls against the power support; or when the axis of the rolling wheel is fixed to the power support, the rolling wheel rolls against the power impact element; or when the axis of the rolling wheel is fixed to the roller support, the rolling wheel rolls against the impact guiding element; or when the axis of the rolling wheel is fixed to the impact guiding element, the rolling wheel rolls against the roller support, thus preventing fitting sliding friction of the power impact element and the power support, or preventing fitting sliding friction of the roller support and the impact guiding element, and reducing wear of the guiding device and/or wear of the impact drive device; the power impact element and the impact guiding element are separated, connected in a separated manner or integrated; the power support and the roller support are separated, connected in a separated manner or integrated.

[0022] A rolling friction or suspension friction impact mining method according to the Method 17 includes the following steps:

the surface of the rolling wheel is manufactured into a convex, a recess, a V groove or a curve etc.; the shape of the roller support or the shape of a contact surface between the impact guiding element and the rolling wheel is locked with the shape of the surface of the rolling wheel; or the shape the power support or the shaped of a contact surface between the power impact element and the rolling wheel is locked with the shape of the surface of the rolling wheel; the rolling wheel, the roller support and the impact guiding element etc. are matched closely or the rolling wheel, the power support and the power impact element etc. are matched closely to control a motion of the impact guiding element and/or the power impact element etc. to be a straight line reciprocating motion through rolling friction.

[0023] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

when the rubbing body support is provided as an external sleeve, the impact guiding element is provided as an internal body; when the rubbing body support is provided as an internal body, the impact guiding element is provided as an external sleeve;

the rubbing body etc. is provided between the external sleeve and the internal body; the external sleeve, the internal body and the rubbing body etc. are matched closely so that the external sleeve or the internal body reciprocates oppositely through rolling friction or suspension friction;
the impact head is supported by the reciprocating external sleeve or internal body to reciprocate with rolling friction or suspension friction.

[0024] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

a raceway guiding device, or a recess guiding device, or a guiding device with a bracket, or a circulating raceway guiding device or a reciprocating stroke section guiding device, or a position-limiting guiding device, or a cylindrical guiding device, or a U-shaped guiding device, or a frame-shaped guiding device, or an irregular guiding device etc. is provided; the rubbing body support, the rubbing body and the impact guiding element etc. are matched closely to enable the impact guiding element to reciprocate through rolling friction or suspension friction; a reactive damage force generated by an impact of the impact head on a coal wall or a rock wall is applied to the guiding device, thus preventing the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device etc. from being damaged by the impact reactive damage force; the guiding device centralizes an impact direction of the impact head and ensures that the next impact of the impact head is applied to an object to be mined; the travelling part drives the machine body to travel to realize reciprocating impact and continuous mining.

[0025] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

the guiding device is combined with a crank component of the crank impact drive device, or the guiding device is combined with the hydraulic impact drive device, or the guiding device is combined with the pneumatic impact drive device etc. and provided in a supporting box; the supporting box and the power support are separated, connected in a separated manner or integrated; the power support includes a crank support or a cylinder etc.; the supporting box and the guiding support are separated, connected in a separated manner or integrated;
two ends of the impact guiding element provided in the supporting box are provided with impact heads, or one end of the impact guiding element is provided with an impact head and the other end is provided with a counterweight element, or one end of the impact guiding element is provided with an impact head etc.; an end of the power impact element extending out of the support box is connected or integrated with the impact head;
the supporting box supports the power impact element and the impact guiding element etc. to reciprocate, thus protecting components in the box from being polluted and corroded by dust, etchant gases and waste water.

[0026] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

a fixing support and a buffering support etc. are provided on the jacking device, the reciprocating impact part or the frame; or when the fixing support is provided on the jacking device, the buffering support etc. is provided on the reciprocating impact part; or when the fixing support is provided on the frame, the buffering support etc. is provided on the jacking device;
a buffering element and a buffering guiding element etc. are provided; the buffering element is provided between the fixing support and the buffering support, or provided between the jacking device and the frame, or is provided between the jacking device and the reciprocating impact part etc.; the buffering guiding element is separated, connected in a separated manner or integrated with the fixing support or the buffering support or the jacking device or the frame or the reciprocating impact part etc.;
the power impact element drives the impact head or the impact guiding element etc. to impact so that an impact reactive force is applied on the buffering support and the fixing support, or is applied on the jacking device and the frame, or is applied on the jacking device and the reciprocating impact part; the buffering element is damaged to absorb the impact reactive force; the buffering guiding element controls a buffering direction so that buffering is reciprocating straight line buffering, thus preventing the impact head from oscillating non-directionally during buffering.

[0027] A rolling friction or suspension friction impact mining method according to the Method 22 includes the following steps:

when the fixing support is provided as a buffering guiding element, the buffering support is provided as a buffering guiding sleeve; or when the buffering support is provided as a buffering guiding element, the fixing support is provided as a buffering guiding sleeve;
the buffering guiding element is locked glidingly with the buffering guiding sleeve; when a guiding lug boss or a guiding groove is provided on the buffering guid-

ing element, a guiding groove or a guiding lug boss etc. is correspondingly provided on the buffering guiding sleeve; two sides of a convex portion of the guiding lug boss are provided with buffering elements etc.; the buffering guiding sleeve is locked on the buffering guiding element; the buffering guiding element, the buffering elements and the buffering guiding sleeve etc. are matched to form a bi-directional guiding buffering structure to have a bi-directional buffering function;

the buffering guiding element supports the buffering guiding sleeve to slide in a reciprocating manner in a straight line along the buffering guiding element, or the buffering guiding sleeve supports the buffering guiding element to slide in a reciprocating manner in a straight line along the buffering guiding sleeve to form bi-directional guiding buffering;

the power impact element drives the impact head or the impact guiding element etc. to impact; an impact reactive damage force is applied on a bi-directional guiding buffering mechanism; the bi-directional guiding buffering mechanism absorbs the impact reactive force;

the bi-directional guiding buffering mechanism is provided on the frame, or is provided on the jacking device, or is provided on the reciprocating impact part, or is provided on the jacking device and the frame, or is provided on the jacking device and the reciprocating part etc.;

the power impact element drives the impact head or the impact guiding element etc. to reciprocate; a buffering element at a front portion of the guiding lug boss and a buffering element etc. at a back portion of the guiding lug boss absorbs an impact reactive force of the impact head; the buffering guiding sleeve and the buffering guiding element slide oppositely in a straight line; the buffering guiding element, the buffering guiding sleeve and the buffering elements etc. are matched to absorb the impact reactive force of the impact head and control a buffering direction to be reciprocating straight line buffering, thus preventing the impact drive device and the guiding device from oscillating non-directionally and stabilizing an impact direction of the impact head.

[0028] A rolling friction or suspension friction impact mining method according to the Method 23 or 24 includes the following steps:

a retaining structure etc. is provided on the fixing support and the buffering support, or a retaining structure etc. is provided on the buffering guiding element or the buffering guiding sleeve; a retaining element etc. is provided on the retaining structure; the retaining element is separated, or connected in a separated manner or integrated with the fixing support, the buffering support, the buffering guiding element or the buffering guiding sleeve etc.;

the retaining element prevents the fixing support and the buffering support from being detached during reciprocating sliding, or the retaining element prevents the buffering guiding element and the buffering guiding sleeve from being detached during opposite reciprocating sliding.

[0029] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

a fixing support and a buffering support etc. are provided on the jacking device, the reciprocating impact part or the frame; or when the fixing support is provided on the jacking device, the buffering support is correspondingly provided on the reciprocating impact part; or when the fixing support is provided on the frame, the buffering support is correspondingly provided on the jacking device; or when the fixing support is provided on the frame, the buffering support is provided on the reciprocating impact part;

a spline shaft and a spline housing etc. are provided; a sliding reciprocating stroke section etc. is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force to form a sliding stroke spline shaft housing buffering mechanism; or a driving pulley is fixed on the fixing support and the driving pulley is connected with a drive shaft of an electric machine, a hydraulic motor or a pneumatic motor etc.; a driven pulley is provided on the buffering support; a belt is provided on the driving pulley and the driven pulley; the driven pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force to form a belt buffering mechanism; the sliding stroke spline shaft housing buffering mechanism or the belt buffering mechanism etc. forms a rotation power buffering mechanism;

an electric machine or a hydraulic motor or a pneumatic motor etc. of a rotation power source element of the reciprocating impact part is provided on the jacking device, or is provided on the frame, or is provided on the reciprocating impact part, or is provided on the jacking device, or is provided on the jacking device and the frame, or is provided on the reciprocating impact part and the jacking device etc.;

a rotation power buffering mechanism is provided on the rotation power source element and a rotation impact transmission element, or is provided on the rotation impact transmission element or is provided on the jacking device and the reciprocating impact part, or is provided on the jacking device and the frame, or is provided on the fixing support and the buffering support, or is provided on the frame and the reciprocating impact part etc.; the rotation power buffering mechanism prevents the electric machine, the hydraulic motor or the pneumatic motor etc. from being

damaged by an impact reactive force;
a buffering element etc. is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part etc.; the buffering guiding element is provided on the frame and the reciprocating impact part, or the buffering guiding element is provided on the fixing support and the buffering support, or the buffering guiding element is provided on the jacking device and the reciprocating impact part etc. to form a structural buffering mechanism; the structural buffering mechanism absorbs an impact reactive force through the buffering element while controlling a buffering direction with the buffering guiding element;
the rotation power buffering mechanism and the structural buffering mechanism are used independently or used in combination;
the rotation power buffering mechanism and/or the structural buffering mechanism etc. are/is provided on the frame and the jacking device, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or provided on the frame and the reciprocating impact part etc.; the structural buffering mechanism is matched with the sliding stroke spline shaft housing buffering mechanism and the belt buffering mechanism etc. to absorb and buffer an impact reactive force of the impact head and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame etc. from being damaged by the impact reactive force and ensuring that an impact direction of the impact head faces an object to be mined.

[0030] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

the jacking device is provided as a rocker arm lifting mechanism etc.; the rocker arm lifting mechanism is provided with a rocker arm etc.; the rocker arm is provided as a parallelogram rocker arm or a single rocker arm etc.; the parallelogram rocker arm is provided with a main rocker arm and a secondary rocker arm etc.;
a supporting box or a supporting frame etc. is provided the reciprocating impact part; one end of the main rocker arm is hinged with the machine body and the other end is hinged with the supporting box or the supporting frame etc.; one end of the secondary rocker arm is hinged with the machine body and the other end is hinged with the supporting box or the supporting frame etc.;
the reciprocating impact part is supported by the main rocker arm and/or the secondary rocker arm; the main rocker arm and the secondary rocker arm are matched to adjust a mining direction or position of the impact head, thus ensuring that the next impact of the impact head is applied to an object to be mined.

[0031] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

a power concentric shaft section, connecting handles and eccentric shafts etc. are provided to form a multi-throw crank; the multi-throw crank and connecting rods etc. form a multi-throw crank multi-rod impact head;
one end of the power concentric shaft section of the multi-throw crank is connected with a power output component of the crank impact drive device;
the other end of the power concentric shaft section is provided with two or more connecting handles and eccentric shafts etc.;
the power concentric shaft section of the multi-throw crank is installed on a supporting box or a supporting frame etc.;
an eccentric shaft of the multi-throw crank is hinged with one end of a connecting rod and the other end of the connecting rod is connected, separated or integrated etc. with the connecting rod; one eccentric shaft drives one or more connecting rods to impact in a reciprocating manner to form a multi-throw crank impact drive device, thus improving mining efficiency.

[0032] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

impact external layer material teeth and impact internal layer material teeth etc. are provided; the impact external layer material teeth are shaped and arranged so that a material fallen by the impact internal layer material teeth can flow out from gaps between the impact external layer material teeth;
the impact internal layer material teeth are shaped or arranged so that an internal layer material of a coal wall or a rock wall to be mined can be fallen;
the impact external layer material teeth and impact internal layer material teeth etc. are arranged in parallel to form a multi-layer impact head; multiple layers of mechanisms are matched with each other to fall and discharge a material; the mining width and mining efficiency are improved by multi-layer impact teeth.

[0033] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

impact teeth etc. are provided; tooth heads etc. are provided on the impact teeth; the distances between

tooth heads of two adjacent layers of impact teeth are different; the impact teeth are provided as multi-layer impact teeth to impact a coal wall or a rock wall to be mined into steps; two or more opposite free surfaces are formed on each step of the step-shaped coal wall or rock wall; the pressure stress and structural strength of the step-shaped coal wall or rock wall are greatly reduced compared with the original planar coal wall or rock wall; the tooth heads and impact teeth are connected in a separated manner or integrated etc.;
after the coal wall or the rock wall is impacted into steps, a material is fallen by using the two opposite free surfaces of the step-shaped coal wall or rock wall when impact teeth of each layer perform mining again, thus greatly reducing impact resistance, avoiding oversize lumps of the material fallen by the impact head, reducing power consumption, reducing an impact reactive force, and improving impact efficiency.

[0034] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

an impact external layer material tooth frame etc. is provided; the impact external layer material tooth frame is provided with a discharge hole etc.;
impact external layer material teeth etc. are provided on the impact external layer material tooth frame; the impact external layer material teeth are provided on the impact external layer material tooth frame and face a to-be-mined surface; the impact external layer material teeth and the impact external layer material tooth frame are connected in a separated manner or integrated etc.; the impact external layer material teeth are shaped or arranged to fall an external layer material of a layer to be mined;
an impact internal layer material tooth frame and impact internal layer material teeth etc. are provided; the impact internal layer material teeth and the an impact internal layer material tooth frame are connected in a separated manner or integrated etc.; the impact internal layer material teeth are shaped or arranged to fall an internal layer material of the layer to be mined;
the discharge hole enables a material fallen by the impact internal layer material teeth to flow out.

[0035] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

the jacking device is provided as a vertical lifting mechanism etc.; the vertical lifting mechanism is provided with a lifting platform and a lifting platform support etc.;
the lifting platform is driven by a rope and rope coiler, a gear and rack, a screw pole, a shaft coupling, a chain wheel and chain, a hydraulic element or a pneumatic element etc. to ascend and descend vertically;
the lifting platform is located and locked by a bolt, a lock tongue, a cushion block, a pull rope, a hydraulic cylinder, or a pneumatic cylinder etc.;
the vertical lifting mechanism drives the reciprocating impact part to move up and down vertically.

[0036] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

wherein the hydraulic impact drive device, the pneumatic impact drive device or the solid flowing impact drive device are provided with a piston, the power rollers, and a cylinder etc.; the power rollers are provided around the piston, or the power rollers are provided at one side of the piston, or the power rollers are provided at two or more sides etc. of the piston; the piston and the power rollers etc. are provided in the cylinder;
supported by the power rollers, the piston and the cylinder reciprocate oppositely with rolling friction to form a rolling piston hydraulic impact drive device or a rolling piston pneumatic impact drive device etc.;
the power impact element is provided as a cylinder rod and a piston etc.; one end of the cylinder rod is connected, separated or integrated with the piston;
a control element etc. is provided; the control element controls a liquid, a gas or a solid to flow; the piston is pushed by a flowing pressure of the liquid, the gas or the solid so that the piston and the cylinder reciprocate with rolling friction.

[0037] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

the power impact element, a cylinder and a control element etc. are provided; a piston and a cylinder rod etc. are provided on the power impact element; the piston is provided in the cylinder; the cylinder rod is provided inside or outside the cylinder; the piston and the cylinder rod are separated, connected in a separated manner or integrated etc.; the guiding roller support etc. is provided; the guiding roller support and the cylinder are separated, connected in a separated manner or integrated etc.; the guiding roller support is provided inside or outside the cylinder; the guiding roller is provided between the guiding roller support and the cylinder; the guiding rollers, the cylinder rod and the guiding roller support are matched closely to form a centralizer; the control element controls a liquid, a gas or a solid to flow; the piston moves under a pressure of the liquid, the gas or the solid; the piston drives the cylinder rod to reciprocate; the

guiding rollers rotate against the guiding roller support and the cylinder rod etc.; a moving direction of the cylinder rod is controlled by rolling friction.

[0038] A rolling friction or suspension friction impact mining method according to the Method 1 includes the following steps:

the roller support is integrated with the guiding support, the impact guiding element, the cylinder, the piston, the power support, or the power impact element etc., thus reducing a space occupied by the roller support; the roller support is integrated with the guiding support, the impact guiding element, the cylinder, the piston, the power support or the power impact element etc. to realize high structural strength and high space utilization; a limited space is used for increasing the volumes of the rollers, thus improving the bearing capacity of the rollers, increasing the contact area of the rollers with the guiding support, the impact guiding element, the cylinder, the piston, the power support or the power impact element etc., and avoiding an overlarge partial pressure and overlarge damage to the guiding support, the impact guiding element, the cylinder, the piston, the power support or the power impact element etc. due to undersize rollers.

[0039] A rolling friction or suspension friction impact mining method according to the Method 3, 11 or 22 includes the following steps:

the guiding position-limiting structure etc. is provided on the rubbing body support, the rubbing body and/or the impact guiding elements; the rubbing body is provided between the rubbing body support and the impact guiding element and are provided in the guiding position-limiting structure; the guiding position-limiting structure limits a moving space and position of the rubbing body; or the power position-limiting structure etc. is provided on the power support, the rubbing body and/or the power impact element; the rubbing body is provided in the power position-limiting structure; the e power position-limiting structure limits a moving space and position of the rubbing body; one end or two ends of the power impact element are provided with a damage-prevention mechanism etc.; the damage-prevention mechanism is matched with the guiding device; an reactive damage force generated by an impact of the impact head on a coal wall or a rock wall is applied to the damage-prevention mechanism; the damage-prevention mechanism isolates the reactive damage force through rotation or split isolation etc. so that the reactive damage force is applied to the guiding device, thus preventing the impact drive device from being damaged by the impact reactive damage force; the guiding device centralizes an impact direction of the impact head;
the buffering element etc. is provided between the frame and the jacking device, or is provided between the jacking device fixing support and the jacking device buffering support, or is provided on the jacking device and the reciprocating impact part or is provided on the frame and the reciprocating impact part; the buffering guiding element is arranged on the frame and the jacking device, or the buffering guiding element is arranged on the jacking device fixing support and the jacking device buffering support, or the buffering guiding element is arranged on the frame and the reciprocating impact part etc. to form a structural buffering mechanism; the structural buffering mechanism buffers an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element.

[0040] A wear-resistant impact mining machine using the rolling friction or suspension friction impact mining method, wherein the invention is implemented by the following technical solution:

it comprises a machine body, a travelling part, and a reciprocating impact part etc.; the reciprocating impact part comprises a guiding device, an impact drive device and an impact head etc.; the guiding device and the impact drive device are separated, connected in a separated manner or integrated; the impact drive device comprises a power support etc.; the guiding device comprises a guiding support etc.; the power support and the guiding support are separated, connected in a separated manner or integrated; the power support and/or the guiding support comprise/comprises a rubbing body support etc.; the rubbing body support and the power support or the rubbing body support and the guiding support are separated, connected in a separated manner or integrated; the rubbing body support comprises a roller support or a suspender support etc.; the roller support and the suspender support are separated, connected in a separated manner or integrated; the roller support comprises a guiding roller support and/or a power roller support etc.; the guiding roller support and the power roller support are separated, connected in a separated manner or integrated; the suspender support comprises a guiding suspender support and/or a power suspender support etc.; the guiding suspender support and the power suspender support are separated, connected in a separated manner or integrated; the guiding device comprises an impact guiding element, a rubbing body and a rubbing body support etc.; the rubbing body comprises rollers and suspenders etc.; the rollers comprise a guiding roller and/or a power roller etc.; the guiding roller and the power roller are separated, connected in a separated manner or integrated; the suspender comprises a guiding suspender and/or a power sus-

pender etc.; the guiding suspender and the power suspender are separated, connected in a separated manner or integrated;

the impact drive device comprises a power impact element and a power support etc.; the impact guiding element and the power impact element are separated, connected in a separated manner or integrated; the impact guiding element and the impact head are connected in a separated manner or integrated; the power impact element and the impact head are moveably connected, separated or integrated; the rubbing body is provided between the guiding support and the impact guiding element, or provided between the power support and the power impact element; the guiding support or the power support comprises the rubbing body support etc.; the power impact element drives the impact guiding element or the impact head to reciprocate; the rubbing body, the rubbing body support and the impact guiding element etc. are matched closely to support the impact head to impact through rolling friction or suspension friction;

the machine body comprises a frame etc.; the frame thereon is provided or is not provided with a jacking device; the reciprocating impact part is provided on the frame or provided on the jacking device etc.; the frame is provided in the machine body or the frame is provided in the machine body combined with the jacking device;

the machine body supports the impact head to impact in a reciprocating manner to fall a material;

the travelling part is provided at a lower portion of the machine body; the travelling part drives the machine body to travel.

[0041] The rubbing body support, the impact guiding element and the rubbing body etc. are matched closely to support an impact of the impact head through rolling friction or suspension friction and centralize an impact direction of the impact head; the impact drive device is protected by the guiding device from being damaged by damage, thus improving impact efficiency.

[0042] The impact drive device comprises a crank impact drive device, or a hydraulic impact drive device, or a pneumatic impact drive device or a solid flowing impact drive device etc.; the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises the power impact element and the power support etc.; the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises a cylinder etc.; the cylinder is separated, connected in a separated manner or integrated with the power support or the guiding support; the impact guiding element and the power impart element are separated, connected in a separated manner or integrated.

[0043] The impact drive device comprises a crank impact drive device, or a hydraulic impact drive device, or a pneumatic impact drive device or a solid flowing impact drive device; the crank impact drive device etc., or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises the power impact element and the power support etc.; the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises a cylinder etc.; the cylinder is separated, connected in a separated manner or integrated with the power support or the guiding support.

[0044] The reciprocating impact part further comprises a supporting box etc.; the guiding device and the impact drive device are combined and provided in the supporting box; two ends of the impact guiding element provided in the supporting box are provided with impact heads, or one end of the impact guiding element is provided with an impact head and the other end is provided with a counterweight element etc. for preventing the impact head from damaging the guiding device, the impact drive device and/or the machine body due to gravity unbalance or one end of the impact guiding element is provided with an impact head; an end of the power impact element is connected or separated with the impact head; the power support and the supporting box are separated, integrated or connected; the supporting box protects components in the box from being polluted and corroded by dust, etchant gases and waste water.

[0045] The reciprocating impact part further comprises a supporting frame etc.; the impact drive device or the guiding device is provided on the supporting frame.

[0046] A position-limiting structure etc. is provided on the reciprocating impact part; the position-limiting structure is provided as a guiding position-limiting structure or a power position-limiting structure etc.; the guiding position-limiting structure and the power position-limiting structure are separated, connected in a separated manner or integrated;

the guiding position-limiting structure and the rubbing body support are connected, separated or integrated; or the guiding position-limiting structure and the impact guiding element are connected, separated or integrated; or the guiding position-limiting structure and the guiding roller are connected, separated or integrated; or the power position-limiting structure and the power support are connected, separated or integrated; or the power position-limiting structure and the power impact element are connected, separated or integrated; or the power position-limiting structure and the power roller are connected, separated or integrated;

the guiding roller or the guiding suspender etc. is provided in the guiding position-limiting structure; the guiding roller or the guiding suspender supports the impact guiding element to reciprocate along the rubbing body support in the guiding position-limiting structure; the guiding position-limiting structure limits a moving space and position of the guiding roller, or the guiding suspender or the impact guiding element etc.; the power roller or the power suspender etc. is provided in the power position-limiting

structure; the power roller or the power suspender etc. supports the power impact element to reciprocate along the power support in the power position-limiting structure; the power position-limiting structure limits a moving space and position of the power roller, the power suspender and the power impact element etc.; the rubbing body support the impact guiding element or the power impact element to reciprocate.

[0047] The position-limiting structure comprises a raceway, or a circulating raceway, or a cylindrical channel, or a pit, or a reciprocating stroke section, or a retainer, or a position-limiting plate, or a position-limiting ring, or a position-limiting sleeve, or a position-limiting platform, or a position-limiting rod, or a position-limiting shaft, or a position-limiting groove, or a spherical bump, or a lug boss, or a bearing, or an internal body matched with an external sleeve, or an oval, or a dumbbell, or a circular column, or a zone, or a circular ring, or a rolling wheel, or a platform-shaped column, or a platform-shaped ball, or a platform-shaped drum, or a groove-shaped column, or a groove-shaped ball, or a groove-shaped rolling wheel, or a groove-shaped oval, or a square, or a U shape, or a frame, or an I shape, or a spline, or an arc, or an V shape, or a reversed V shape, or a circular shape, or a plate, or a polygonal, or a cylinder, or a spline housing or a multi-rhombus key etc.

[0048] The retainer comprises a cylindrical retainer, or a plate-type retainer, or a U-shaped retainer, or a V-shaped retainer, or a polygonal retainer, or an irregular retainer, or a triangular retainer, or a square retainer or a chain link retainer etc.

[0049] The raceway comprises a reciprocating stroke section, or a circulating raceway, or a spiral raceway, or a wave-shaped raceway, or an annular raceway, or a straight line raceway or an irregular raceway etc.

[0050] The circulating raceway comprises an annular circulating raceway, or a spiral circulating raceway, or a wave-shaped circulating raceway, or an irregular circulating raceway etc.

[0051] Through rolling in a circulating raceway, or rolling in a reciprocating manner, or rolling in situ, or rolling in a pit, or rolling in a raceway, or rolling in a retainer etc., the roller supports the impact guiding element and the guiding roller support to reciprocate oppositely.

[0052] A roller or multiple rollers are arranged longitudinally in a reciprocating direction, or a roller or multiple rollers are arranged transversely in a reciprocating direction.

[0053] The guiding roller or the power roller etc. fills a raceway space besides an effective stroke, or fill a raceway space along a raceway.

[0054] The guiding roller or the power roller etc. is arranged in parallel or in a staggered manner along a reciprocating impact direction.

[0055] The impact drive device comprises the power support and the power impact element etc.; the guiding device comprises the guiding rollers, the guiding support and the impact guiding element etc.; the guiding roller comprises a rolling wheel etc.; the rolling wheel is provided between the power support and the power impact element, or is provided between the guiding support and the impact guiding element; the rolling wheel comprises an axis etc. of the rolling wheel; the rolling wheel is separated, connected in a separated manner or integrated with the axis of the rolling wheel; when the axis of the rolling wheel is fixed to the power impact element, the rolling wheel rolls against the power support; when the axis of the rolling wheel is fixed to the power support, the rolling wheel rolls against the power impact element, thus preventing fitting sliding friction of the power impact element and the power support; or when the axis of the rolling wheel is fixed to the guiding support, the rolling wheel rolls against the impact guiding element; when the axis of the rolling wheel is fixed to the impact guiding element, the rolling wheel rolls against the guiding support, thus preventing fitting sliding friction of the guiding support and the impact guiding element and reducing wear of the impact drive device.

[0056] The impact drive device comprises the power support and the power impact element etc.; the guiding device comprises the guiding roller, the guiding support, and the impact guiding element etc.; the guiding roller comprises a rolling wheel etc.; the surface of the rolling wheel is manufactured into a convex, a recess, a V groove or a curve etc.; the shape of the roller support or the shape of a contact surface between the impact guiding element and the rolling wheel is locked with the shape of the surface of the rolling wheel; or the shape the power support or the shape of a contact surface between the power support and the rolling wheel is locked with the shape of the surface of the rolling wheel; a motion of the impact guiding element or the power impact element is controlled to be a straight line reciprocating motion through rolling friction, thus reducing wear of the impact drive device.

[0057] The guiding support or the power support, or the impact guiding element, or the power impact element comprises a reciprocating stroke section etc.; the width of the reciprocating stroke section is not larger than or equal to or close to the width of rubbing body in a rolling direction; the length of the reciprocating stroke section is equal to or close to the sum of 1/2 of the stroke of the impact guiding element or the power impact element and the roller diameter; the rollers are provided between the roller support and the impact guiding element, or provided between the power support and the power impact element and provided in the reciprocating stroke section; the reciprocating stroke section limits a rolling space and position of the rollers; the reciprocating stroke section ensures that the rollers have rolling friction with the guiding support, or the power support, or the impact guiding element, or the power impact element etc. while moving.

[0058] The rubbing body support comprises a pit, or the impact guiding element comprises a pit, or the power support comprises a pit or the power impact element comprises a pit etc.; the rubbing body is provided be-

tween the rubbing body support and the impact guiding element and are provided in the pit; or the rubbing body is provided between the power support and the power impact element and provided in the pit; the pit limits a rolling space and position of the rubbing body.

[0059] The rubbing body support comprises a raceway, or the impact guiding element comprises a raceway, or the rubbing body support and the impact guiding element comprises a raceway etc.; the rubbing body support, the impact guiding element and the rubbing body rolling in the raceway etc. are locked closely to enable the impact guiding element to reciprocate through rolling friction of the rubbing body; the raceway limits a rolling space and position of the rubbing body.

[0060] The guiding device comprises the roller support, the impact guiding element, a retainer, and the guiding roller etc.; the retainer etc. is provided between the roller support and the impact guiding element; the guiding roller is provided in the retainer; the thickness of the retainer is smaller than the diameter of the guiding roller; two parts of the guiding roller higher than the retainer are respectively provided in the roller support and the impact guiding element; the retainer is provided independently, or is fixed to the roller support, or is fixed to the impact guiding element etc.; the roller support and the impact guiding element are matched closely with the guiding rollers etc. in the retainer so that the impact guiding element reciprocates through rolling friction; the retainer limits a rolling space and position of the guiding rollers.

[0061] The guiding device further comprises a guiding section etc.; the guiding section is provided in the impact guiding element etc.; two ends of the guiding section besides an overlapped section with the impact guiding element are equal or substantially equal in weight; the guiding section and the impact guiding element are connected in a separated manner, or integrated; the guiding section is provided in the rubbing body support; the guiding section is always located on the rubbing body support when moving, thus maintaining gravitational equilibrium at two ends of the impact guiding element in a static state or in a moving state; the rubbing body support, the rubbing body and the impact guiding element etc. are matched closely to support the impact guiding element to reciprocate with rolling friction or suspension friction; the power impact element drives the impact head or the impact guiding element to reciprocate.

[0062] The impact drive device comprises a crank impact drive device, or a hydraulic impact drive device or a pneumatic impact drive device or a solid flowing impact drive device etc.; when the rubbing body support comprises an external sleeve, the impact guiding element comprises an internal body; or when the rubbing body support comprises an internal body, the impact guiding element comprises an external body; the rubbing body is provided between the external sleeve and the internal body; the external sleeve, the internal body and the rubbing body etc. are matched closely to reciprocate oppositely through rolling friction or suspension friction; the impact head is supported by the reciprocating external sleeve or internal body to reciprocate with rolling friction; the power impact element drives the impact head to impact.

[0063] The guiding device comprises a guiding rubbing body support and/or a guiding impact guiding element and/or guiding rubbing body etc.; the guiding impact guiding element, the guiding rubbing body and the guiding rubbing body support are matched closely to ensure that the impact head impacts in a reciprocating manner in a straight line and/or prevent the impact head from rotating; the guiding rubbing body support and the guiding support are separated, connected in a separated manner or integrated; the guiding impact guiding element and the impact guiding element are separated, connected in a separated manner or integrated; or the impact drive device comprises a guiding power support and/or a guiding power impact element and/or guiding rubbing body etc.; the guiding power impact element, the guiding rubbing body and the guiding power support etc. are matched closely to ensure that the power impact element reciprocates in a straight line and/or prevent the power impact element from rotating; the guiding power support and the power support are separated, connected in a separated manner or integrated; the guiding power impact element and the power impact element are separated, connected in a separated manner or integrated.

[0064] The guiding rubbing body support comprises a quadrangular rubbing body support, or a U-shaped rubbing body support, or a frame-shaped rubbing body support, or a box rubbing body support, or a triangular rubbing body support, or an oval rubbing body support, or a polygonal rubbing body support, or an irregular rubbing body support, or a raceway rubbing body support, or a pit rubbing body support, or a reciprocating stroke section rubbing body support, or a retainer rubbing body support, or a circulating raceway rubbing body support, or a groove-shaped rubbing body support, or an I-shaped rubbing body support, or a spline housing rubbing body support, or an arc-shaped rubbing body support, or a V-shaped rubbing body support, or a reversed V-shaped rubbing body support, or a plate-shaped rubbing body support, or a cylindrical rubbing body support, or a multi-rhombus key rubbing body support etc.; the guiding rubbing body support is separated, connected in a separated manner or integrated with the power support, or the guiding rubbing body support is separated, connected in a separated manner or integrated with the guiding support.

[0065] The guiding impact guiding element comprises a quadrangular impact guiding element, or a U-shaped impact guiding element, or a frame-shaped impact guiding element, or a V-shaped impact guiding element, or a triangular impact guiding element, or an oval impact guiding element, or a polygonal impact guiding element, or an irregular impact guiding element, or a raceway impact guiding element, or a pit impact guiding element, or a reciprocating stroke section impact guiding element, or a retainer impact guiding element, or a circulating race-

way impact guiding element, or a groove-shaped impact guiding element, or an I-shaped impact guiding element, or a spline housing impact guiding element, or an arc-shaped impact guiding element, or a V-shaped impact guiding element, or a reversed V-shaped impact guiding element, or a plate-shaped impact guiding element, or a cylindrical impact guiding element, or a multi-rhombus key impact guiding element etc.; the guiding impact guiding element is separated, connected in a separated manner or integrated with the impact guiding element, or the guiding impact guiding element is separated, connected in a separated manner or integrated with the power impact element.

[0066] The rollers comprise a spherical roller, or an oval roller, or a dumbbell-shaped roller, or a circular column roller, or a conical roller, or a circular ring-shaped roller, or a rolling wheel roller, or a platform-shaped column roller, or a platform-shaped ball roller, or a platform-shaped drum roller, or a groove-shaped drum roller, or a groove-shaped column roller, or a groove-shaped ball roller, or a groove-shaped rolling wheel roller, or a groove-shaped oval roller, or a roller with an axe, or a roller with a hole, or a multi-rhombus key roller, a multi-rhombus sleeve roller, or a rolling drum-shaped roller, or a rolling bear roller, or a rolling needle roller or a rolling barrel roller, or a linear bearing etc.; the roller and the guiding roller are separated, connected in a separated manner or integrated.

[0067] The shapes/shape of the impact guiding element and/or the rubbing body support are/is locked closely with the shape of the rubbing body to form a guiding position-limiting structure; or the shape of the power impact element or the power support is locked closely with the shape of the rubbing body to form a power position-limiting structure; the position-limiting structure controls a moving direction of the impact guiding element or the power impact element etc., and/or prevents the impact guiding element or the power impact element etc. from rotating; the guiding position-limiting structure and the power position-limiting structure are separated, connected in a separated manner or integrated.

[0068] The power support comprises a cylinder etc.; the power impact element comprises a piston etc.; the cylinder comprises a square cylinder, or a spline housing cylinder, or an arc-shaped cylinder, or an oval cylinder, or a circular cylinder or a polygonal cylinder or a cylindrical cylinder etc.; the shapes/shape of the piston and/or the power rollers are/is locked closely with the shape of the cylinder to form a power position-limiting structure; a moving direction of the piston is controlled through rolling friction or suspension friction.

[0069] The power support comprises a cylinder etc.; the power impact element comprises a piston etc.; the piston comprises a square piston, or a U-shaped piston, or a frame-shaped piston, or a groove-shaped piston, or a spline-shaped piston, or an arc-shaped piston, or a V-shaped piston, or an oval piston, or a circular piston, or a plate-shaped piston, or a polygonal piston, or a multi-rhombus key piston, or an E-shaped piston etc.; the shapes/shape of the cylinder and/or the power rollers are locked closely with the shape of the piston to form a power position-limiting structure; a moving direction of the piston is controlled through rolling friction or suspension friction.

[0070] The impact guiding element comprises a raceway impact guiding element, or a pit impact guiding element, or an impact guiding element with a bracket, or a circulating raceway impact guiding element, or a stroke section impact guiding element, or a position-limiting impact guiding element, or a cylindrical impact guiding element, or a U-shaped impact guiding element, or a V-shaped impact guiding element, or a polygonal impact guiding element, or a frame-shaped impact guiding element, or an irregular impact guiding element, or an E-shaped impact guiding element etc.

[0071] The rubbing body support comprises a raceway rubbing body support, or a pit rubbing body support, or a rubbing body support with a bracket, or a circulating raceway rubbing body support, or a stroke section rubbing body support, or a position-limiting rubbing body support, or a cylindrical rubbing body support, or a U-shaped rubbing body support, or a V-shaped rubbing body support, or a polygonal rubbing body support, or a frame-shaped rubbing body support, or a box-shaped rubbing body support, or an irregular rubbing body support etc.

[0072] The power impact element comprises a raceway power impact element, or a pit power impact element, or a power impact element with a bracket, or a circulating raceway power impact element, or a stroke section power impact element, or a position-limiting power impact element, or a cylindrical power impact element, or a U-shaped power impact element, or a frame-shaped power impact element, or an irregular power impact element, or an E-shaped power impact element, or a polygonal power impact element etc.

[0073] The power support comprises a raceway power support, or a pit power support, or a power support with a bracket, or a circulating raceway power support, or a stroke section power support, or a position-limiting power support, or a cylindrical power support, or a U-shaped power support, or a E-shaped power support, or a polygonal power support, or a box-shaped power support, or a frame-shaped power support, or an irregular power support etc.

[0074] The rubbing body are provided around the impact guiding element, or provided at one side of the impact guiding element, or provided at two or more sides etc. of the impact guiding element; or the rubbing body are provided around the power impact element, or provided at one side of the power impact element, or provided at two or more sides etc. of the power impact element; the power impact element comprises a piston, a cylinder, a piston rod or a guiding rod etc.

[0075] A circulating raceway etc. is provided on the impact guiding element or the guiding roller support; the

circulating raceway is connected in a separated manner, or integrated with the impact guiding element or the guiding roller support; the impact guiding element is provided in the guiding roller support or is provided outside the guiding roller support; the guiding roller is provided in the circulating raceway; one part of the guiding roller exposed out of the circulating raceway is in contact with the surface of the guiding roller support or the surface of the impact guiding element; an impact guiding element main body is not in contact with the surface of the guiding roller support; the guiding rollers support the impact guiding element and the guiding roller support etc. to reciprocate oppositely through rolling friction.

[0076] The circulating raceway comprises an annular circulating raceway etc.; an annular plane of the annular circulating raceway is arranged along a reciprocating direction; the annular circulating raceway is arranged around the impact guiding element, or is arranged individually on the impact guiding element or is arranged symmetrically on the impact guiding element etc.; the guiding rollers roll in a reciprocating and circulating manner in the annular circulating raceway.

[0077] The circulating raceway comprises a spiral circulating raceway or a wave-shaped circulating raceway etc.; the spiral circulating raceway or the wave-shaped circulating raceway is provided on the impact guiding element or the guiding roller support etc.; the guiding roller rolls in a circulating manner in the spiral circulating raceway or the wave-shaped circulating raceway; position of the guiding roller bearing a pressure between the impact guiding element and the guiding roller support changes in a circulating manner, thus reducing the probability that the guiding roller always partially rolls on the impact guiding element and the guiding roller support to bear a overlarge pressure and to be damaged.

[0078] A circulating supporting section and a circulating section etc. of the circulating raceway are arranged along the surface of the impact guiding element or the guiding roller support; the guiding roller in the circulating supporting section supports the guiding roller support to have rolling friction with the impact guiding element; the guiding roller in the circulating sections does not support the impact guiding element to have rolling friction with the guiding roller support.

[0079] The retainer is provided in the circulating raceway; the guiding roller is provided in the retainer and the circulating raceway; the thickness of the retainer is smaller than the guiding roller diameter; two parts of the guiding roller higher than the retainer are respectively provided in the circulating raceway and the impact guiding element or the guiding roller support, thus preventing reverse friction between the guiding roller.

[0080] The circulating raceway is connected or integrated with the guiding support, or the impact guiding element, or the power support, or the power impact element etc.

[0081] A circulating raceway etc. is provided on the power impact element or the power support; the circulating raceway is connected in a separated manner or integrated with the power impact element or the power support; the power impact element is provided in the power support or is provided out of the power support; the power roller is provided in the circulating raceway; the power roller exposed out of the circulating raceway is in contact with the surface of the power support or the surface of the power impact element etc.; a power impact element main body is not in contact with the surface of the power support; the power roller supports the power impact element and the power support to reciprocate oppositely with rolling friction.

[0082] The circulating raceway comprises an annular circulating raceway etc.; an annular plane of the annular circulating raceway is arranged along a reciprocating direction; the annular circulating raceway is arranged around the power impact element, or is arranged individually on the power impact element or is arranged symmetrically etc. on the power impact element; the power roller rolls in a reciprocating and circulating manner in the annular circulating raceway.

[0083] The circulating raceway comprises a spiral circulating raceway or a wave-shaped circulating raceway etc.; the spiral circulating raceway or the wave-shaped circulating raceway is provided on the power impact element or the power support etc.; the power roller rolls in a circulating manner in the spiral circulating raceway or the wave-shaped circulating raceway; position of the power roller bearing a pressure between the power impact element and the power support changes in a circulating manner, thus reducing the probability that the power roller always partially rolls on the power impact element and the power support to bear a overlarge pressure and to be damaged.

[0084] A plane of the circulating raceway is arranged vertical to the surface of the guiding roller support or the impact guiding element or the power impact element or the cylinder or the power roller support etc.; or the plane of the circulating raceway is arranged approximately in parallel with the surface of the guiding roller support or the impact guiding element or the power impact element or the cylinder or the power roller support etc.; the circulating raceway comprises a circulating supporting section and a circulating section etc.; the roller in the circulating supporting section supports rolling friction of the impact guiding element and the guiding roller support, or rolling friction of the power impact element an the cylinder, or rolling friction of the power impact element and the power roller support, while the roller in the circulating section does not support rolling friction of the guiding roller support, the impact guiding element, the power impact element, the cylinder, and the power roller support etc.

[0085] The roller is arranged densely in the circulating raceway; the length of the circulating raceway enables the roller to support rolling friction of the guiding roller support and the impact guiding element or enables the roller to support rolling friction of the piston and the cylinder, or enables the roller to support rolling friction of

the power impact element and the power roller support etc., thus preventing partial sliding friction or collision of the guiding roller support and the impact guiding element, or the piston and the cylinder, or the power impact element and the power roller support etc.

[0086] A retainer is provided in the circulating raceway; the retainer comprises a flexible retainer and a chain link retainer; the power roller is provided in the retainer and is provided in the circulating raceway; the thickness of the retainer is smaller than the power roller diameter; two parts of the power roller higher than the retainer are respectively provided in the circulating raceway and the power impact element or the power support etc., thus preventing reverse friction between the power rollers.

[0087] The circulating raceway comprises a pressure-bearing circulating raceway and a pressure-free circulating raceway etc.; the pressure-free circulating raceway is provided in a separated manner with the power support, or the power impact element, or the guiding roller support, or the impact guiding element etc.; the pressure-free circulating raceway is detachable, thus facilitating observation, maintenance and replacement of the power roller.

[0088] A pressure-bearing section of the circulating raceway is provided with a wear-resistant material or a high strength material etc., thus improving the wear resistance of the circulating raceway, improving resistance of the circulating raceway on a pressure generated by the guiding support and the impact guiding element on the circulating raceway through the guiding rollers, or improving the resistance of the circulating raceway on a pressure generated by the power support and the power impact element on the circulating raceway through the power roller etc., reducing massive use of the wear-resistant material and the high strength material by the impact guiding element, or the guiding support, or the power impact element, or the power support etc., and lowering the requirement on the integral wear resistance or strength of the guiding support, or the impact guiding element, or the power support, or the power impact element etc.

[0089] The impact guiding element, or the guiding support, or the power impact element or the power support etc. is a lightweight material; the lightweight material comprises an aluminum alloy, high strength plastic, ceramics, a titanium alloy, carbon fiber, light steel or a composite material etc.

[0090] The hydraulic impact drive device, or the pneumatic impact drive device, or the solid flowing impact drive device comprises a sealing element etc.; the sealing element is provided between the power impact element and the power support, thus preventing a liquid or a gas or a solid from entering from one side of the power impact element to the other side.

[0091] The sealing element is provided on the power impact element; the sealing element is located at one side or two sides of the roller or located between a front roller and a back roller etc., thus preventing a liquid, a gas, or a solid from entering from one side of the power impact element to the other side.

[0092] The power impact element thereon is provided with a sealing element etc.; the sealing element is provided at one side or two sides of the circulating raceway, or is provided between a front circulating raceway and a back raceway etc.; the sealing piece does no reciprocate on the rollers, thus preventing a liquid, a gas or a solid from entering from one side of the power impact element into the other side; the rollers support the power impact element or the impact guiding element etc. to reciprocate through rolling friction, thus reducing a running resistance of the power impact element or the impact guiding element and improving a moving speed of the power impact element or the impact guiding element; the sealing element is used for sealing.

[0093] The hydraulic impact drive device, or the pneumatic impact drive device, or the solid flowing impact drive device comprises a piston, the rubbing body, a cylinder, and the rubbing body support etc.; the rubbing body is provided around the piston or is provided at one side or are provided at two or more sides of the piston etc.; the piston and the rubbing body are provided in the cylinder; the rubbing body supports the piston and the cylinder to reciprocate with rolling friction or suspension friction; the piston comprises a piston rod etc.; the piston and the piston rod are separated, connected in a separated manner or integrated; the rubbing body support and the cylinder are separated, connected in a separated manner or integrated; or the rubbing body support and the piston are separated, connected or integrated; the rubbing body support comprises the roller support and/or the suspender support etc.; the roller support comprises the guiding roller support and/or a piston roller support etc.; the suspender support comprises the guiding suspender support and/or a piston suspender support etc.; the guiding roller support and the piston roller support are separated, connected in a separated manner or integrated; the guiding suspender support and the piston suspender support are separated, connected in a separated manner, or integrated; the roller support and the suspender support are separated, connected in a separated manner or integrated.

[0094] The rubbing body and the piston are integrated; the piston is a spherical piston etc.; the cylinder is a cylindrical cylinder etc. matched with the diameter of the spherical piston; the spherical piston and the cylindrical cylinder form sealing; the spherical piston does not use a sealing element to isolate a cavity into a pressure relief area and a pressure charging area.

[0095] The hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises the power impact element, a cylinder and a control element etc.; the power impact element comprises a piston and a cylinder rod etc.; the piston is provided in the cylinder; the cylinder rod is provided inside or outside the cylinder; the cylinder rod is the power impact element and the impact guiding element etc.; the

piston and the cylinder rod are separated, connected in a separated manner or integrated; the guiding roller support etc. is provided; the guiding roller support and the cylinder are separated, connected in a separated manner or integrated; the guiding roller support is provided inside or outside the cylinder; the guiding roller is provided between the guiding roller support and the cylinder rod; the guiding roller, the cylinder rod and the guiding roller support etc. are matched closely to form a centralizer; the control element controls flowing of a liquid, a gas or a solid etc.; the piston moves under a pressure of the liquid, the gas or the solid; the piston drives the cylinder rod to reciprocate; the guiding rollers rotate against the guiding roller support and the cylinder rod; a moving direction of the cylinder rod is controlled by the control element.

[0096] The rubbing body support is integrated with the guiding support, or the impact guiding element, or a cylinder, or a piston, or the power support, or the power impact element etc., thus reducing a space occupied by the rubbing body support; the rubbing body support is integrated with the guiding support, or the impact guiding element, or the cylinder, or the piston, or the power support or the power impact element etc., thus realizing high structural strength and high space utilization; a limited space is used for increasing the volumes of the rubbing body, thus improving the bearing capacity of the rubbing body, increasing the contact area of the rubbing body and the guiding support or the impact guiding element, or the cylinder, or the piston, or the power support or the power impact element etc., and avoiding an overlarge partial pressure and overlarge damage to the guiding support or the impact guiding element, or the cylinder, or the piston, or the power support or the power impact element etc. due to undersize rubbing body.

[0097] The guiding support is provided at two or more ends of the power support to form two or more guiding support points; the two or more ends comprise two or more ends of a guiding support main body or spatial positions comprising two or more ends out of the guiding support main body etc.; the two or more guiding support points all support the gravity of the impact head; the rubbing body, the impact guiding element and the rubbing body support etc. are matched closely to form a multi-point support impact head structure; the multi-point support impact head structure supports the impact head through multiple points to centralize an impact direction of the impact head, thus maximally increasing a centralizing width to the impact head, strengthening centralizing on the impact head, maximally controlling the impact direction of the impact head, preventing the impact drive device from being damaged by an impact damage force and a reactive force, and extending the service life of the device.

[0098] Two or more rows of rubbing bodies etc. are provided around the impact guiding element or the power impact element; the two or more rows of rubbing bodies bear a gravitational load of the impact guiding element and/or the power impact element; at least one or more rubbing bodies of one row of rubbing bodies support the impact guiding element or the power impact element etc. to impact in a reciprocating manner, thus preventing centralized damage on the rubbing body or the rubbing body support caused by a gravitational load of the impact guiding element or the power impact element on only one row of rubbing bodies.

[0099] The guiding device comprises the impact guiding element etc.; the impact guiding element comprises an upper impact guiding element and a lower impact guiding element or a left impact guiding element and a right impact guiding element etc.; the impact drive device comprises the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device etc.; the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises the power impact element etc.; the power impact element is provided between the upper impact guiding element or the lower impact guiding element, or is provided between the left impact guiding element or the right impact guiding element; the upper impact guiding element or the lower impact guiding element or the left impact guiding element or the right impact guiding element etc. forms a multi-point support impact head structure.

[0100] The rubbing body are closely locked with the rubbing body support and/or the impact guiding element etc. through a contact surface; the contact surfaces of the rubbing body with the rubbing body support and/or the impact guiding element etc. are as large as possible; or the contact surfaces of the rubbing body and a cylinder and/or a piston etc. are closely locked; the contact surfaces of the rubbing body and the cylinder and/or the piston etc. are as large as possible, thus preventing an overlarge partial stress on the rubbing body, reducing partial friction of the rubbing body on the rubbing body support and/or the impact guiding element, or reducing partial friction of the rubbing body on the cylinder and/or the piston, and strengthening centralizing on the impact guiding element or the piston etc.; the rubbing body support and/or the impact guiding element etc. are/is closely locked with the rubbing body through the contact surfaces to limit a moving space and position of the rubbing body; or the cylinder and/or the piston etc. are/is closely locked with the rubbing body through the contact surfaces to limit a moving space and position of the rubbing body.

[0101] The rubbing body are provided between the guiding support and the impact guiding element, or is provided between a cylinder and the impact guiding element, or is provided between the power support and the power impact element etc.; the rubbing body, the impact guiding element and the rubbing body support etc. are matched closely to support the impact head at multiple points through rolling friction or suspension friction to impact; the impact guiding element is actually an extension and damage of the power impact element; through the extension and damage of the impact guiding

element, a centralizing width on the impact head is increased maximally, centralizing on the impact head is strengthened, and the impact head is controlled maximally to prevent the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device from being damaged by an impact damage force and a reactive force.

[0102] The impact guiding element is provided on the rubbing body support; the impact guiding element or the rubbing body support comprises a liquid suspender or a gas suspender etc.; or the power impact element or the power support comprises a liquid suspender or a gas suspender etc.; or the impact guiding element and the rubbing body support comprise a magnetic suspender etc.; or the power impact element and the power support comprises a magnetic suspender etc.; the magnetic suspender comprises an electromagnetic suspender, or a permanent magnet suspender etc.; the suspender enables the impact guiding element and the rubbing body support or the power impact element and the power support etc. to form suspension friction; the suspension friction reduces a frictional resistance or friction damage between the impact guiding element and the rubbing body support or between the power impact element and the power support, thus improving the service life of the impact drive device or the guiding device.

[0103] The suspender comprises a gas source, a control valve, a transmission pipeline, and a gas cavity etc.; the gas cavity is provided on the guiding device or the impact drive device etc.; a gas suspender is formed between the guiding support and the impact guiding element; or a gas suspender is formed between the power support and the power impact element; the gas suspender supports the impact guiding element to reciprocate with suspension friction; or the gas suspender supports the power impact element to reciprocate with suspension friction.

[0104] The liquid suspender comprises a liquid medium source, a control valve, a transmission pipeline and a liquid cavity etc.; the liquid cavity is provided on the guiding device or the impact drive device etc.; a liquid suspender is formed between the guiding support and the impact guiding element; or a liquid suspender is formed between the power support and the power impact element; the liquid suspender supports the impact guiding element to reciprocate with suspension friction or the liquid suspender supports the power impact element to reciprocate with suspension friction.

[0105] The magnetic suspender comprises an electromagnetic suspender, or a permanent magnet suspender etc.; the electromagnetic suspender comprises an electromagnet etc.; the permanent magnet suspender comprises a permanent magnet etc.; the electromagnet or the permanent magnet is provided on the impact guiding element and the guiding support or is provided on the power impact element and the power support etc.

[0106] The impact guiding element and the guiding support or the power impact element and the power support comprise an N pole permanent magnet etc.; or the impact guiding element and the guiding support or the power impact element and the power support comprise an S pole permanent magnet etc.; N pole permanent magnets repel each other and S pole permanent magnets repel each other to form a magnetic suspender; the power impact element drives the impact guiding element to reciprocate; the magnetic suspender supports the impact guiding element and the guiding support to reciprocate oppositely with suspension friction; or the magnetic suspender supports the power impact element and the power support to reciprocate oppositely with suspension friction.

[0107] The impact guiding element and the guiding support or the power impact element or the power support comprise a cathode electromagnet etc.; or the impact guiding element and the guiding support or the power impact element or the power support comprise an anode electromagnet etc.; cathode electromagnets repel each other and anode electromagnets repel each other to form a magnetic suspender; the power impact element drives the impact guiding element to reciprocate; the magnetic suspender supports the impact guiding element and the guiding support to reciprocate oppositely with suspension friction; or the magnetic suspender supports the power impact element or the power support to reciprocate oppositely with suspension friction.

[0108] One end or two ends of the power impact element are provided with a damage-prevention mechanism etc.; the damage-prevention mechanism is provided as a rotating structure or a split structure etc.; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type etc.; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive force in a split manner.

[0109] The damage-prevention mechanism comprises an arc-shaped catching groove type or a rotating joint etc.; the arc-shaped catching groove type comprises an arc-shaped raised head and a groove etc. moveably locked with the arc-shaped raised head; the groove and the power impact element are connected in a separated manner or integrated; the arc-shaped raised head moveably locked with the groove and the impact head are connected in a separated manner or integrated; the rotating joint comprises a flexible universal joint rotating joint or a universal bearing rotating joint, or a platform-type rotating joint with multiple degrees of freedom or a universal coupling rotating joint etc.; the flexible universal joint rotating joint comprises an elastic element and a universal joint etc.; when the universal joint is stressed, an relative motion of the universal joint is adjusted by the elastic body; the universal joint bearing rotating joint comprises a universal joint base, and a rotating joint etc.; the rotating joint is fixed on the universal joint base; when the univer-

sal joint bearing is stressed, a relative motion is adjusted by the universal joint base; the platform-type rotating joint with multiple degrees of freedom is composed of a moving cylinder, an upper universal hinge, a lower universal hinge, an upper platform and a lower platform etc.; when the upper platform and the lower platform are stressed, the upper platform moves in multiple degrees of freedom in a space through a telescopic movement of the moving cylinder; the universal coupling rotating joint is a cross shaft rotating joint etc.; the cross shaft rotating joint comprises a cross shaft and a cross universal joint fork etc.; the cross universal joint fork moves relatively through connection of the cross shaft.

[0110] The damage-prevention mechanism comprises a rotating structure etc.; the rotating structure comprises a ball-end catching groove type etc.; the ball-end catching groove type comprises a ball end and a ball end groove etc. moveably locked with the ball end; the ball end and the power impact element are connected in a separated manner or integrated; the ball end groove moveably locked with the ball end and the impact head are connected in a separated manner or integrated; the power impact element and the impact head are connected or separated; the power impact element drives the impact head to impact; an impact damage force is applied on the damage-prevention mechanism; the rotating structure of the damage-prevention mechanism is stressed to rotate.

[0111] A buffering mechanism is provided between the jacking device or the reciprocating impact part or the machine body or the jacking device and the reciprocating impact part, or between the jacking device and the machine body etc.

[0112] The buffering mechanism comprises a structural buffering mechanism or a power buffering mechanism etc.

[0113] The structural buffering mechanism comprises a fixing support, a buffering support and a buffering element etc.

[0114] The power buffering mechanism comprises a sliding stroke spline shaft housing buffering mechanism and a belt buffering mechanism etc.

[0115] The jacking device or the reciprocating impact part or the frame comprises a structural buffering mechanism etc.; the structural buffering mechanism comprises a fixing support and a buffering support etc.; when the fixing support is provided on the jacking device, the buffering support is correspondingly provided on the reciprocating impact part; or when the fixing support is provided on the frame, the buffering support is correspondingly provided on the jacking device; or when the buffering support is provided on the frame, the fixing support is provided on the reciprocating impact part; a buffering element is provided between the fixing support and the buffering support, or is provided between the jacking device and the frame, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part etc.; a buffering guiding element is provided on the fixing support and the buffering support, or is provided on the jacking device and the frame, or is provided on the jacking device and the reciprocating part, or is provided on the frame and the reciprocating impact part etc.; the power impact element drives the impact head to impact; when an impact reactive force is applied on the buffering support and the fixing support, or is applied on the jacking device and the frame, or is applied on the jacking device and the reciprocating impact part, or is applied on the frame and the reciprocating impact part, the buffering element is damaged to absorb the impact reactive force and the buffering guiding element controls a buffering direction to be reciprocating straight line buffering, thus preventing the impact head from oscillating non-directionally during buffering.

[0116] The jacking device or the reciprocating impact part or the frame comprises a structural buffering mechanism etc.; the structural buffering mechanism comprises a fixing support and a buffering support etc.; or when the fixing support is provided on the jacking device, the buffering support is correspondingly provided on the reciprocating impact part; or when the fixing support is provided on the machine body, the buffering support is correspondingly provided on the jacking device; or when the fixing support is provided on the frame, the buffering support is provided on the reciprocating impact part; when the fixing support comprises a buffering guiding element, the buffering support comprises a buffering guiding sleeve etc.; or when the buffering support comprises a buffering guiding element, the fixing support comprises a buffering guiding sleeve etc.; when a guiding lug boss or a guiding groove is provided on the buffering guiding element, a guiding groove or a guiding lug boss locked with the guiding lug boss and the guiding groove is provided on the buffering guiding sleeve; two sides of a convex part of the guiding lug boss are provided with a buffering element etc.; the buffering guiding element supports the buffering guiding sleeve to slide in a reciprocating manner in a straight line along the buffering guiding sleeve or the buffering guiding sleeve supports the buffering guiding element to slide in a reciprocating manner in a straight line along the buffering guiding sleeve; the buffering guiding element, the buffering element and the buffering guiding sleeve etc. form a bi-directional buffering mechanism; the power impact element drives the impact head to impact; an impact reactive damage force is applied on the bi-directional buffering mechanism; the bi-directional buffering mechanism absorbs the impact reactive force; the power impact element drives the impact head to reciprocate; the buffering elements of the front part of the guiding lug boss and the back part of the guiding lug boss absorb an impact reactive force of the impact head; the buffering guiding element, the buffering guiding sleeve and the buffering elements etc. are matched with each other to absorb the impact reactive force of the impact head and control a buffering direction to be reciprocating straight line buffering; the buffering guiding sleeve

slides oppositely in a straight line against the buffering guiding element, thus preventing the jacking device, the impact drive device and the guiding device etc. from oscillating non-directionally and stabilizing an impact direction of the impact head.

[0117] The fixing support and the buffering support comprise a retaining structure etc. or the buffering guiding element and the buffering guiding sleeve comprise a retaining structure etc.; the retaining structure comprises a retaining element etc.; the retaining element prevents the fixing support and the buffering support from being detached during opposite reciprocating sliding or the retaining element prevents the buffering guiding element and the buffering guiding sleeve from being detached during opposite reciprocating sliding; the retaining element and the fixing support are provided separately, or connected or integrated; or the retaining element and the buffering support are provided separately, or connected or integrated; or the retaining element and the buffering guiding element are provided separately or connected or integrated; or the retaining element and the buffering guiding sleeve are provided separately or connected or integrated.

[0118] The reciprocating impact part or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element etc.; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor etc.; the jacking device or the reciprocating impact part or the frame comprises a structural buffering mechanism etc.; the structure buffering mechanism comprises a fixing support and a buffering support etc.; or when the fixing support is provided on the jacking device, the buffering support is correspondingly provided on the reciprocating impact part; or when the fixing support is provided on the frame, the buffering support is correspondingly provided on the jacking device; or when the fixing support is provided on the frame, the buffering support is correspondingly provided on the reciprocating impact part; a buffering element is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part etc.; a power buffering mechanism is provided between the rotation power source element and the rotation impact transmission element, or is provided on the rotation impact transmission element etc.; the power buffering mechanism comprises a sliding stroke spline shaft housing buffering mechanism or a belt buffering mechanism etc.; the sliding stroke spline shaft housing buffering mechanism comprises a spline shaft and a spline housing etc.; a sliding reciprocating stroke section etc. is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the belt buffering mechanism comprises a driving pulley, a driven pulley and a belt etc.; the driving pulley is fixed on the fixing support; the driving pulley is connected with a drive shaft of the electric machine, the hydraulic motor, or the pneumatic motor etc.; the driven pulley is provided on the buffering support; the belt is provided on the driving pulley and the driven pulley; the driven pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force; the belt buffering device prevents the electric machine, the hydraulic motor or the pneumatic motor etc. from being damaged; the structural buffering mechanism further comprises a buffering guiding element etc.; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device etc.; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device etc.; the structural buffering mechanism absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structural buffering mechanism and is matched with the sliding stroke spline shaft housing buffering mechanism or the belt buffering mechanism etc. to absorb and buffer an impact reactive force of the impact head and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame etc. from being damaged by buffering non-directional oscillation, and ensuring that an impact direction of the impact head faces an objected to be mined.

[0119] The reciprocating impact part comprises a buffering device etc.; the buffering device comprises a rotation power buffering mechanism etc.; the rotation power buffering mechanism comprises a sliding stroke spline shaft housing buffering mechanism etc.; the sliding stroke spline shaft housing buffering mechanism comprises a spline shaft and a spline housing etc.; a sliding reciprocating stroke section etc. is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the spline shaft and the spline housing are connected glidingly with reciprocating buffering; the impact drive device comprises a rotation power source element and a rotation impact transmission element etc.; the rotation power source element comprises an electric machine, or a hydraulic motor or a pneumatic motor etc.; the electronic machine, or

the hydraulic motor or the pneumatic motor comprises a drive shaft etc.; the spline housing or the spline shaft is connected or integrated with the drive shaft; the spline shaft or the spline housing is connected or integrate with the rotation impact transmission element.

[0120] The reciprocating impact part comprises a buffering device etc.; the buffering device comprises a rotation power buffering mechanism etc.; the rotation power buffering mechanism comprises a belt buffering mechanism etc.; the jacking device comprises a rocker arm etc.; the rocker arm comprises a rocker arm buffering element and a rocker arm fixing element etc.; the buffering device further comprises a buffering element etc.; the buffering element is provided between the rocker arm buffering element and the rocker arm fixing element; the belt buffering mechanism comprises a driving pulley, a belt and a driven pulley etc.; the driving pulley is fixed on the rocker arm fixing element; the driving pulley is connected with a drive shaft of an electric machine, or a hydraulic motor or a pneumatic motor etc.; the driven pulley is provided on the rocker arm buffering element; the belt is provided on the driving pulley and the driven pulley; the driven pulley buffers as the rocker arm buffering element is impacted; the belt absorbs an impact reactive force to prevent the electric machine, or the hydraulic motor or the pneumatic motor etc. from being damaged; the belt buffering device comprises a tensioner etc.

[0121] The tensioner is provided at an inner side or an outer side of the belt; the tensioner comprises a tensioning wheel, a tensioning wheel bracket, a tensioning spring, a tensioning adjusting rod, and a tensioner base etc.; the tensioning wheel is provided on the tensioning wheel bracket; a guiding hole etc. is provided on the tensioning wheel bracket; one end of the tensioning adjusting rod is a polished rod and the other end is a screw rod and the middle is provided with a shoulder; the tensioning wheel bracket is matched with the polished rod end of the tensioning adjusting rod through the guiding hole; the screw rod end of the tensioning adjusting rod is in threaded connection etc. with the tensioning base; the tensioning spring is provided between the tensioning wheel bracket and the shoulder; the tensioning wheel tightly presses the belt with an elastic force of the spring; a tensioning force is adjusted with a screwing length of the screw rod and the tensioning base.

[0122] The belt buffering device comprises the tensioner etc.; the tensioner comprises a sliding base and a tensioning spring etc.; the driving pulley and the electric machine, or the hydraulic motor or the pneumatic motor etc. are installed on the sliding base; the sliding base is matched glidingly with the rocker arm fixing element; one end of the tensioning spring is connected with the sliding base and the other end is connected with the rocker arm fixing element; a certain acting force is applied on the sliding base by the spring to tension the belt.

[0123] The jacking device comprises a rocker arm lifting mechanism or a vertical lifting mechanism etc.

[0124] The rocker arm lifting mechanism is a parallelogram rocker arm or a single rocker arm etc.; the parallelogram rocker arm comprises a main rocker arm and a secondary rocker arm etc.; the reciprocating impact part comprises a supporting box or a supporting frame etc.; one end of the main rocker arm is hinged with the machine body and the other end is hinged with the supporting box or the supporting frame etc.; one end of the secondary rocker arm is hinged with the machine body and the other end is hinged with the supporting box or the supporting frame; the main rocker arm and/or the secondary rocker arm support/supports the reciprocating impact part; the main rocker arm and the secondary rocker arm are matched with each other to adjust a mining direction or position of the impact head and ensure that the next impact of the impact head is applied on an object to be mined; the travelling part drives the machine body to travel to realize reciprocating impact and continuous mining.

[0125] The vertical lifting mechanism drives the reciprocating impact part to move up and down vertically; the vertical lifting mechanism comprises a lifting platform, a lifting platform support and a vertical lifting driver etc.; the vertical lifting driver comprises a rope and rope coiler, or a gear and rack, or a screw pole, or a shaft coupling, or a chain wheel and chain, or a hydraulic element or a pneumatic element etc.; the vertical lifting driver drives the vertical lifting platform to ascend and descend vertically; the vertical lifting mechanism further comprises a locating locker etc.; the locating locker comprises a bolt, a lock tongue, a cushion block, a pull rope, a hydraulic cylinder, or a pneumatic cylinder etc.; the locating locker locks the lifting platform.

[0126] The jacking device comprises a rocker arm etc.; the machine body comprises a rotating disc etc.; the rocker arm is provided on the rotating disc; the rotating disc drives the rocker arm to rotate at a front part of the machine body.

[0127] The jacking device comprises a rocker arm etc.; the machine body comprises a rotating disc etc.; the jacking device comprises a rocker arm lifting cylinder etc.; one end of the rocker arm lifting cylinder is fixed on the rotating disc and the other end is hinged with the rocker arm; the rocker arm lifting cylinder drives the rocker arm to move up and down.

[0128] The jacking device comprises a rocker arm etc.; the machine body comprises a rotating disc etc.; the jacking device comprises a rocker arm lifting cylinder etc.; the rocker arm lifting cylinder drives the rocker arm to move up and down; the rotating disc drives the rocker arm to move left and right; the rotating disc and the rocker arm lifting cylinder are matched to adjust the to impact a material impact head on multiple positions in multiple directions.

[0129] The jacking device comprises a translation lifting mechanism etc.; the translation lifting mechanism is provided at a front part of the machine body; the translation lifting mechanism enables translation of the reciprocating impact part relative to the machine body.

[0130] The reciprocating impact part comprises a sup-

porting box or a supporting frame etc.; the impact drive device comprises a crank impact drive device etc.; the crank impact drive device comprises a multi-throw crank multi-rod impact mechanism, and a power output component etc.; the multi-throw crank multi-rod impact mechanism comprises a multi-throw crank and connecting rods etc.; the multi-throw crank comprises power concentric shaft sections, connecting handles and eccentric shafts etc.; the power concentric shaft section, the connecting handles and the eccentric shafts are separated, connected or integrated; one end of the power concentric shaft section of the multi-throw crank is connected with the power output component of the crank impact drive device; the other end of the power concentric shaft section is provided with two or more connecting handles and eccentric shafts etc.; the power concentric shaft section of the multi-throw crank is installed on the supporting box or the supporting frame; an eccentric shaft of the multi-throw crank is connected with one end of the connecting rod and the other end of the connecting rod is connected or separated with the impact head; one eccentric shaft drives one or more connecting rods to impact in a reciprocating manner.

[0131] The eccentric shafts are one or two or more eccentric shafts; two or more eccentric shafts are arranged radially at intervals along the power concentric shaft section to form angular difference; the impact drive device comprises a power output component etc.; the power concentric shaft section of the multi-throw crank and the power output component are separated, connected or integrated.

[0132] The multi-throw crank is provided with a liquid channel etc.; the liquid channel is provided on the power concentric shaft section, the connecting handle and/or the eccentric shafts etc.

[0133] The impact drive device is the crank impact drive device etc.; the crank impact drive device comprises a power source element, a cam shaft and a cam etc.; the cam shaft and the cam are connected in a separated manner or integrated; the power source element drives the cam shaft to rotate; the cam installed on the cam shaft drives the impact head to impact.

[0134] The crank impact drive device comprises a crank impact drive mechanism etc.; the crank impact drive mechanism comprises a power source element, an eccentric shaft and the power impact element etc.; the eccentric shaft is hinged with one end of the power impact element; the power source element drives the eccentric shaft to rotate; the eccentric shaft drives the power impact element to impact in a reciprocating manner.

[0135] The crank impact drive device comprises a crank slider impact drive mechanism etc.; the crank slider impact drive mechanism comprises a power source element, a crank, a slider, an oscillating bar, a connecting rod and the power impact element etc.; one end of the crank is connected with the power source element and the other end is hinged with the slider; the slider is connected with the oscillating bar and capable of sliding on the oscillating bar; the oscillating bar is hinged with the connecting rod; the connecting rod is hinged with one end of the power impact element; the connecting rod and the power impact element are separated, connected in a separated manner or integrated; the power source element drives the crank to rotate; the crank drives the slider to enable the oscillating bar to oscillate; through the connecting rod, the oscillating bar drives the power impact element to move.

[0136] The crank impact drive device comprises a crank oscillating bar impact drive mechanism etc.; the crank oscillating bar impact drive mechanism comprises a rotating part, a slider, an oscillating bar and a straightening connecting rod etc.; the rotating part comprises a rotating handle or a rotating wheel etc.; an end of the rotating handle or the rotating wheel is installed with the slider etc.; the slider is connected glidingly with the oscillating bar; one end of the oscillating bar is hinged and fixed; through the slider, the rotating handle or the rotating wheel drives the other end of the oscillating bar to oscillate in a reciprocating manner; one end of the straightening connecting rod is connected with the oscillating end of the oscillating bar and the other end is hinged with the power impact element or the impact guiding element; the straightening connecting rod and the power impact element are separated, or connected in a separated manner, or integrated; the straightening connecting rod and the impact guiding element are separated, or connected in a separated manner, or integrated; the oscillating bar oscillates to drive the straightening connecting rod to oscillate; the straightening connecting rod drives the impact guiding element or the power impact element to impact in a reciprocating manner.

[0137] The reciprocating impact part comprises the impact head etc.; the impact guiding element is provided with setting teeth etc.; the impact drive device comprises a transmission device etc.; the transmission device is a gear transmission device etc.; the gear transmission device comprises a power wheel and a transmission wheel etc.; the transmission wheel is provided with setting teeth etc.; the power wheel drives the transmission wheel; the setting teeth on the transmission wheel are meshed with the setting teeth on the impact guiding element; when the setting teeth on the transmission wheel are rotated to be meshed with the setting teeth on the impact guiding element, the impact guiding element is driven to impact a coal wall or a rock wall; when the setting teeth on the impact guiding element correspond to a toothless portion of the setting teeth on the transmission wheel, the impact guiding element is separated from the transmission wheel; at the moment, the impact head is held back by the coal wall or the rock wall when the machine body travels; the impact head draws back the impact guiding element; when the setting teeth on the transmission wheel are rotated to be meshed with setting teeth of the impact guiding element again, the impact guiding element is driven again to impact the coal wall or the rock wall.

[0138] The impact drive device comprises the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device etc.; the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises two or more power impact elements etc.; two or more power impact elements and the impact head are connected, separated or integrated.

[0139] The reciprocating impact part comprises a supporting box etc.; the impact drive device comprises a rotation power source element etc.; the rotation power source element comprises a transmission component etc.; the transmission component comprises a variable transmission component etc.; the variable transmission component is a gear transmission component etc.; when there are multiple gear transmission components, a part of the gear transmission components are provided in the supporting box while the other part of the gear transmission components are provided inside the supporting box or outside the supporting box.

[0140] The reciprocating impact part comprises a supporting box etc.; the impact drive device comprises a rotation power source element etc.; the rotation power source element comprises a transmission component etc.; the transmission component comprises a variable transmission component etc.; the variable transmission component comprises a gear transmission component or a combination of a gear transmission component and a belt transmission component etc.

[0141] The reciprocating impact part comprises one or more guiding devices etc.

[0142] The guiding device is composed of two or more guiding devices etc.; the impact drive device drives two or more power impact elements and two or more guiding devices to match with each other; two or more power impact elements drive two or more impact heads.

[0143] The guiding device is composed of two or more guiding devices etc.; the impact drive device drives one power impact element and two or more guiding devices to be matched with each other.

[0144] The impact guiding element is provided at one side, a front part, two or more sides or the periphery etc. of the impact drive device.

[0145] The impact head comprises impact external layer material teeth and impact internal layer material teeth etc.; the impact internal layer material teeth are shaped or arranged so as to fall an internal layer material of a coal wall or a rock wall to be mined; the impact external layer material teeth are shaped and arranged so that a material fallen by the impact internal layer material teeth can flow out from gaps between the impact external layer material teeth; the impact external layer material teeth and impact internal layer material teeth etc. are arranged in parallel to form a multi-layer impact head; the mining width and mining efficiency are improved by multi-layer impact teeth.

[0146] The impact head comprises a step tooth impact cutting mechanism etc.; the step tooth impact cutting mechanism comprises impact teeth etc.; the impact teeth are multi-layer impact teeth etc.; tooth heads etc. are provided on the impact teeth; the tooth heads and the impact teeth are connected in a separated manner or integrated; the distances between tooth heads of two adjacent layers of impact teeth are different; a coal wall or a rock wall to be mined is impacted into steps; two or more opposite free surfaces are formed on each step of the step-shaped coal wall or rock wall; the pressure stress and structural strength of the step-shaped coal wall or rock wall are greatly reduced compared with the original planar coal wall or rock wall; after the coal wall or the rock wall is impacted into steps, a material is fallen by reasonably using the two opposite free surfaces of the step-shaped coal wall or rock wall when impact teeth of each layer perform mining again, thus greatly reducing impact resistance, avoiding oversize lumps of the material fallen by the impact head, reducing power consumption and improving impact efficiency.

[0147] The impact head comprises an impact external layer material tooth frame and impact external layer material teeth etc.; the impact external layer material tooth frame is provided with a discharge hole etc.; the impact external layer material teeth are provided on the impact external layer material tooth frame and face a to-be-mined surface; the impact external layer material teeth are shaped or arranged to fall an external layer material of a layer to be mined; the impact head comprises an impact internal layer material tooth frame and impact internal layer material teeth etc.; the impact internal layer material teeth and the impact internal layer material tooth frame are connected in a separated manner or integrated; the impact internal layer material teeth are shaped or arranged to fall an internal layer material of the layer to be mined; the discharge hole enables the material fallen by the impact internal layer material teeth to flow out; multiple layers of impact mechanisms are matched with each other to fall and discharge a material simultaneously.

[0148] The reciprocating impact part comprises the impact head etc.; the impact head comprises an impact tooth frame and impact teeth etc.; impact guiding elements are arranged on the impact tooth frame symmetrically or asymmetrically; the impact teeth and the impact tooth frame connected in a separated manner or integrated.

[0149] The reciprocating impact part comprises an impact head etc.; the impact head comprises an impact tooth frame and impact teeth etc.; the impact teeth are multi-layer impact teeth etc.; tooth heads etc. are provided on the impact teeth; the impact teeth and the tooth heads are connected in a separated manner or integrated; the tooth heads are arranged into spherical impact heads, or conical impact heads, or hemispherical impact heads, or shovel-shaped impact heads, or trapezoidal impact heads, or triangular impact heads, or step-shaped impact heads etc.

[0150] The impact tooth frame comprises an arc-shaped plate, or a trapezoidal bracket, or a semicircular bracket, or a triangular bracket, or a conical bracket, or a flat plane bracket, or a frame-shaped bracket or a V-shaped bracket etc.

[0151] The impact head comprises the impact teeth etc.; the impact teeth comprise top surface cleaning teeth, bottom surface cleaning teeth or side cleaning teeth etc.

[0152] The impact head comprises the impact tooth frame and the impact teeth etc.; top surface cleaning teeth, bottom surface cleaning teeth and side cleaning teeth etc. are provided on the same impact tooth frame.

[0153] The reciprocating impact part comprises the impact head etc.; the impact head comprises shovel teeth etc.; the impact head is composed of one or more shovel teeth; the shovel teeth comprise long shovel teeth or short shovel teeth etc.; the sides of the shovel teeth are provided with or not provided with cutting edges.

[0154] The reciprocating impact part comprises the impact head etc.; the impact head comprises shovel teeth etc.; the shovel teeth comprise conical teeth, wedged teeth, axe teeth, cutter teeth or chisel teeth etc.

[0155] The reciprocating impact part comprises the impact head etc.; the impact head comprises shovel teeth and fixing components; the shovel teeth and the fixing components are integrated or moveably connected; the moveable connection comprises a splicing type, a catching groove type, a step type, a spherical surface type, a pin tooth type, or a bolt fixing type.

[0156] The impact head completes coal falling and surface cleaning or coal impacting and falling at the same time by a reciprocating impact.

[0157] The impact guiding element is provided at two sides of the impact drive device; one end of the impact guiding element is provided with an impact head and the other end is provided with the same or different impact heads; different impact heads comprise impact heads with different shapes or different weights etc.

[0158] The reciprocating impact part comprises the impact head etc.; the impact head is installed at a front part of the machine body, or at one side or two or more sides etc. of the machine body.

[0159] The reciprocating impact part comprises the impact head etc.; the jacking device comprises a rocker arm etc.; an angle adjuster etc. is provided between the impact head and the rocker arm or between the impact head and the machine body; the angle adjuster adjusts an impact direction of the impact head.

[0160] The reciprocating impact part comprises a supporting box or a supporting frame etc.; the supporting box or the supporting frame comprises a lubricating system etc.

[0161] The reciprocating impact part comprises a supporting box or a supporting frame etc.; the supporting box is fully sealed or partly sealed etc.; the supporting box or the supporting frame comprises a sealing element etc.; the sealing element is provided on a moveable junction of the impact drive device or the guiding device and the supporting box; or the sealing element is provided on a moveable junction of the impact drive device or the guiding device and the supporting frame.

[0162] The guiding device comprises the impact guiding element etc.; the reciprocating impact part comprises a supporting box etc.; the junction of the power impact element and the impact head is provided with an impact element hood etc.; or the junction of the impact guiding element and the impact head is provided with a guiding element hood etc.; the power impact element and the impact head are connected or separated; the impact guiding element and the impact head are connected or integrated; a sealing element is provided between the impact element hood or the guiding element hood and the supporting box.

[0163] The guiding device comprises the impact guiding element and the rubbing body support etc.; the impact drive device comprises the power impact element and the power support etc.; a sealing element is provided between the impact guiding element and the rubbing body support, or is provided between the power impact element and the power support etc.

[0164] The sealing element comprises a sealing cavity, a sealing fin, a sealing plug, a sealing ring or a sealing gasket.

[0165] The sealing element is made of a rubber material, a polyurethane material, a nylon material, a plastic material, a metal material or a mixed material etc.

[0166] The guiding device comprises the impact guiding element etc.; the junction of the power impact element and the impact head is provided with an impact element hood etc.; or the junction of the impact guiding element and the impact head is provided with a guiding element hood etc.; the power impact element and the impact head are connected or separated; the impact guiding element and the impact head are connected, separated or integrated; the impact guiding element and the impact head are connected or integrated.

[0167] The guiding device comprises the impact guiding element etc.; the impact guiding element and the power impact element are separated; the power impact element and the impact head are separated; the power impact element drives the impact head to impact; the impact head is provided on the impact guiding element; the machine body is provided on the traveling part; the traveling part drives the machine body to travel; the machine body travels to hold back the impact head by a coal wall or a rock wall.

[0168] The guiding device comprises the rubbing body support and the impact guiding element etc.; the impact guiding element is provided on the rubbing body support; the rubbing body support is provided on the frame or is provided on the jacking device; the power impact element comprises a power impact cylinder etc.; the impact guiding element is separated with the power impact cylinder; the power impact cylinder and the impact head are separated; the impact head are provided on the impact guid-

ing element; the machine body is provided on the travelling part; the traveling part drives the machine body to travel; the machine body travels to hold back the impact head by a coal wall or a rock wall; the power impact cylinder drives the impact head to impact.

[0169] The guiding rollers, or the rubbing body support, or the impact guiding element or the power impact element or the retainer etc. is of a high strength wear-resistant material; the high strength wear-resistant material is a hard alloy, wear-resistant plastic, wear-resistant steel, wear-resistant rubber, wear-resistant ceramics, a self-lubricating wear-resistant material or a mixed wear-resistant material etc.

[0170] The machine body comprises a control device, a dragging cable device, an atomizing device, a water spraying device or a cooling device etc.

[0171] The frame or the jacking device comprises a crushing device or a material guiding device etc.

[0172] The machine body comprises a shovel plate etc.

[0173] The shovel plate comprises a star wheel setting claw or a crab claw setting claw or a rolling rake etc.

[0174] The machine body comprises a conveyor etc.

[0175] The conveyor is provided on the machine body to convey a material mined by the reciprocating impact part to a back part of the machine body; the conveyor comprises a scraper conveyor, a belt conveyor or an armored belt conveyor etc.

[0176] The guiding device comprises the guiding roller, the guiding roller support and the impact guiding element etc.; a circulating raceway etc. is provided on the impact guiding element or the guiding roller support; the circulating raceway comprises an annular circulating raceway, or a spiral circulating raceway, or a wave-shaped circulating raceway, or an irregular circulating raceway etc.; the circulating raceway and the impact guiding element or the guiding roller support are connected in a separated manner or integrated; the impact guiding element is provided in the guiding roller support; the guiding roller support is provided in the circulating raceway; the guiding roller exposed out of the circulating raceway is in contact with the surface of the guiding roller support or the surface of the impact guiding element; an impact guiding element main body is not in contact with the surface of the guiding roller support; the guiding rollers support the impact guiding element and the guiding roller support to reciprocate oppositely through rolling friction; the guiding device and the crank impact drive device etc. are combined and provided in the jacking device or the frame; one end or two ends of the power impact element are provided with a damage-prevention mechanism etc.; the damage-prevention mechanism comprises a rotating structure or a split structure etc.; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type etc.; the rotating structure or the split structure etc. of the damage-prevention mechanism is matched with the guiding device; the power impact element drives the impact head to impact; an impact reactive force of the impact head on a coal wall or a rock wall is applied to the rotating structure or the split structure; the rotating structure is stressed to rotate or the split structure isolates a reactive damage force in a split manner, thus preventing the crank impact drive device from being damaged by the impact reactive damage force; the reciprocating impact part, or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element etc.; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor etc.; the jacking device or the reciprocating impact part or the frame comprises a fixing support and a buffering support etc.; or when the frame comprises the fixing support, the jacking device comprises the buffering support etc.; or when the jacking device comprises the fixing support, the reciprocating impact part comprises the buffering support etc.; or when the frame comprises the fixing support, the buffering support etc. is correspondingly provided on the reciprocating impact part; a buffering device etc. is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; the buffering device comprises a rotation power buffering device and a structure guiding buffering device etc.; the rotation power buffering device is provided between the rotation power source element and the rotation impact transmission element or is provided in the rotation impact transmission element etc.; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering device or a belt buffering device etc.; the sliding stroke spline shaft housing buffering device comprises a spline shaft and a spline housing etc.; a sliding reciprocating stroke section etc. is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the belt buffering device comprises a driving pulley, a driven pulley and a belt etc.; the driving pulley is fixed on the fixing support; the driving pulley is connected with a drive shaft of the electric machine, the hydraulic motor, or the pneumatic motor etc.; the driven pulley is provided on the buffering support; the belt is provided on the driving pulley and the driven pulley; the driving pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force; the belt buffering device prevents the electric machine, the hydraulic motor, or the pneumatic motor

etc. from being damaged; the structure guiding buffering device comprises a buffering element and a buffering guiding element etc.; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device etc.; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device etc.; the structure guiding buffering device absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering device or the belt buffering device etc. to absorb and buffer an impact reactive force of the reciprocating impact part and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.

[0177] The guiding device comprises the guiding rollers, the guiding roller support and the guiding impact element etc.; the guiding roller is provided between the guiding roller support and the impact guiding element; the guiding device comprises an external sleeve and an internal body etc.; a raceway etc. is provided on the external sleeve or the internal body; the guiding roller is provided in the raceway and between the external sleeve and the internal body; the external sleeve, the internal body and the guiding rollers etc. are matched closely so that the external sleeve or the internal body reciprocates oppositely through rolling friction of the guiding rollers; the rolling friction controls an impact direction of the external sleeve or the internal body; the impact head and the reciprocating external sleeve or internal body are integrated or connected.

[0178] The guiding device comprises an external sleeve and an internal body etc.; a retainer etc. is provided between the external sleeve and the internal body; the guiding roller is provided in the retainer and provided between the external sleeve and the internal body; when the guiding roller support is the external sleeve, the impact guiding element is the internal body; the external sleeve supports the guiding rollers and the internal body; when the guiding roller support is the internal body, the impact guiding element is the external sleeve; the internal body supports the guiding rollers and the external sleeve; the external sleeve, the internal body and the guiding rollers etc. are matched closely so that the external sleeve or the internal body reciprocates oppositely through rolling friction of the guiding rollers; an impact direction of the external sleeve or the internal body is controlled by rolling friction.

[0179] The guiding device and the crank impact drive device etc. are combined and provided in the jacking device or the frame; one end or two ends of the power impact element are provided with an damage-prevention mechanism etc.; the damage-prevention mechanism comprises a rotating structure or a split structure etc.; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type etc.; the rotating structure or the split structure etc. of the damage-prevention mechanism is matched with the guiding device; the power impact element drives the impact head to impact; an impact reactive damage force of the impact head on a coal wall or a rock wall is applied to the rotating structure or the split structure; the rotating structure is stressed to rotate or the split structure isolates a reactive damage force in a split manner, thus preventing the crank impact drive device from being damaged by the impact reactive damage force; the reciprocating impact part, or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element etc.; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor etc.; the jacking device or the reciprocating impact part or the frame comprises a fixing support and a buffering support etc.; or when the frame comprises the fixing support, the jacking device comprises the buffering support etc.; or when the jacking device comprises the fixing support, the reciprocating impact part comprises the buffering support etc.; or when the frame comprises the fixing support, the buffering support etc. is correspondingly provided on the reciprocating impact part; a buffering device etc. is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; the buffering device comprises a rotation power buffering device and a structure guiding buffering device etc.; the rotation power buffering device is provided between the rotation power source element and the rotation impact transmission element or is provided in the rotation impact transmission element; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering device or a belt buffering device etc.; the sliding stroke spline shaft housing buffering device comprises a spline shaft and a spline housing etc.; a sliding reciprocating stroke section etc. is provided between the spline shaft and the spline housing; when im-

pacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the belt buffering device comprises a driving pulley, a driven pulley and a belt etc.; the driving pulley is fixed on the fixing support; the driving pulley is connected with a drive shaft of the electric machine, the hydraulic motor, or the pneumatic motor etc.; the driven pulley is provided on the buffering support; the belt is provided on the driving pulley and the driven pulley; the driving pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force; the belt buffering device prevents the electric machine, the hydraulic motor, or the pneumatic motor etc. from being damaged; the structure guiding buffering device comprises a buffering element and a buffering guiding element etc.; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device etc.; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device etc.; the structure guiding buffering device absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering device or the belt buffering device to absorb and buffer an impact reactive force of the reciprocating impact part and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.

[0180] The guiding device comprises the guiding rollers, the guiding roller support and the impact guiding element etc.; the guiding roller is provided between the guiding roller support and the impact guiding element; the guiding device further comprises a retainer etc.; the guiding rollers comprise rolling shafts etc.; the retainer is provided between the guiding roller support and the impact guiding element etc.; the rolling shafts are provided in the retainer; the thickness of the retainer is smaller than the guiding roller diameter; two parts of the guiding rollers higher than the retainer are respectively provided in the guiding roller support and the impact guiding element; a raceway etc. is provided on the guiding roller support or the impact guiding element; the guiding roller is provided in the retainer and the raceway; the retainer and the raceway limit a rolling space of the guiding rollers; the guiding rollers roll against the raceway; the guiding roller support, the impact guiding element and the guiding rollers in the retainer and the raceway etc. are matched closely to enable the impact guiding element to reciprocate with rolling friction; an impact direction of the impact guiding element is controlled by rolling friction; the impact guiding element and the impact head are connected, or integrated or separated; one end or two ends of the power impact element are provided with an damage-prevention mechanism etc.; the damage-prevention mechanism comprises a rotating structure or a split structure etc.; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type etc.; the rotating structure or the split structure etc. of the damage-prevention mechanism is matched with the guiding device; the power impact element drives the impact head to impact; an impact reactive damage force of the impact head on a coal wall or a rock wall is applied to the rotating structure or the split structure etc.; the rotating structure is stressed to rotate, or the split structure isolates the reactive damage force in a split manner; a structure guiding buffering device etc. is provided on the jacking device, or is provided between the jacking device and the frame, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; the structure guiding buffering device absorbs and buffers the impact reactive damage force generated by the impact head.

[0181] The hydraulic impact drive device or the pneumatic impact drive device comprises a cylinder, a piston, and the power rollers etc.; the cylinder, the piston and/or the power rollers comprise/comprises a power position-limiting structure etc.; the power rollers are provided in the piston and in the cylinder; the power rollers support rolling fiction of the piston and the cylinder in the power position-limiting structure; the power position-limiting structure limits a moving space and position of the power rollers and/or the piston etc.; the guiding device comprises the impact guiding element, the roller support and the guiding rollers etc.; the impact guiding element, the rubbing body support and/or the guiding rollers comprise a guiding position-limiting structure etc.; the guiding rollers support the impact guiding element to reciprocate along the rubbing body support in the guiding position-limiting structure; the guiding position-limiting structure limits a rolling space and position of the guiding rollers; the power position-limiting structure and the cylinder are connected, or separated, or integrated; or the power position-limiting structure and the piston are connected, or separated or integrated; or the power position-limiting structure and the power rollers are connected, or separated or integrated; or the guiding position-limiting structure and the rubbing body support are connected, or separated or integrated; or the guiding position-limiting structure and the impact guiding element are connected, or separated or integrated; or the guiding position-limiting structure and the guiding rollers are connected, or separated or integrated.

[0182] The reciprocating impact part comprises the guiding device and the impact drive device etc.; the impact drive device comprises the crank impact drive de-

vice, or the hydraulic impact drive device or the pneumatic impact drive device etc.; the reciprocating impact part further comprises a supporting box or a supporting frame etc.; the supporting box or the supporting frame supports the guiding device; the impact drive device comprises a crank multi-throw eccentric shaft mechanism and a power output component etc.; the crank multi-throw eccentric shaft mechanism comprises a multi-throw crank and the power impact element etc.; the multi-throw crank comprises a power concentric shaft section, connecting handles and eccentric shafts etc.; the power concentric shaft section, the connecting handles and the eccentric shafts etc. are combined in a separated manner or integrated; one end of the power concentric shaft section of the multi-throw crank is connected with the power output component and the other end is provided with two or more connecting handles and eccentric shafts etc.; two or more eccentric shafts are arranged radially at intervals along the power concentric shaft section to form angular difference; the power concentric shaft section of the multi-throw crank is installed on the supporting box or the supporting frame; two or more eccentric shafts of the multi-throw crank are connected with one end of two or more power impact elements; the other end of the power impact element is provided with an impact head etc.; a damage-prevention mechanism is provided between the power impact element and the impact head; the damage-prevention mechanism is a split structure or a rotating structure etc.; the guiding device comprises an external sleeve, an internal body and the guiding rollers etc.; the internal body comprises an internal body upper element and an internal body lower element etc.; the external sleeve is a frame-shaped external sleeve etc.; the frame-shaped external sleeve comprises a frame-shaped external sleeve upper element and a frame-shaped external sleeve lower element etc.; the frame-shaped external sleeve upper element and the frame-shaped external sleeve lower element comprise a reciprocating stroke section or a raceway etc.; the guiding roller is provided between the internal body upper element and the frame-shaped external sleeve upper element and is provided between the internal body lower element and the frame-shaped external sleeve lower element; the frame-shaped external sleeve, the internal body and the guiding rollers provided in the reciprocating stroke section or in the raceway etc. are matched closely so that the guiding rollers support the frame-shaped external sleeve to reciprocate with rolling friction and prevent the frame-shaped external sleeve from rotating; the external sleeve and the impact head are connected or integrated; two or more power impact elements alternatively drive the impact head to impact; the rotating structure of the damage-prevention mechanism is stressed to rotate, or the split structure isolates an impact reactive damage force in a split manner; the external sleeve, the internal body and the guiding rollers etc. are matched closely to centralize an impact direction of the impact head; the power impact element does not guide the impact head and is not damaged by the damage force.

[0183] The impact drive device comprises a rolling piston hydraulic impact drive device or a rolling piston pneumatic impact drive device etc.; the rolling piston hydraulic impact drive device or the rolling piston pneumatic impact drive device comprises a cylinder, a piston, piston rollers, a control element and the power impact element etc.; the piston rollers are provided in the piston to form a rolling piston; the rolling piston is provided in the cylinder; the rolling piston and the cylinder are supported by the piston rollers to have rolling friction; the control element controls a liquid or a gas to flow; the rolling piston is pushed by the liquid or the gas to reciprocate; one end of the power impact element is separated, connected or integrated with the piston; the other end of the power impact element is connected or separated with the impact head; one end or two ends of the power impact element are provided with a damage-prevention mechanism etc.; the damage-prevention mechanism is provided as a rotating structure or a split structure etc.; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type etc.; the rotating structure or the split structure etc. of the damage-prevention mechanism is matched with the guiding device; the rotating structure is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element drives the impact head to impact; an impact reactive damage force of the impact head on a coal wall or a rock wall is applied to the guiding device; the reciprocating impact part, or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element etc.; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor etc.; the jacking device or the reciprocating impact part or the frame comprises a fixing support and a buffering support etc.; or when the frame comprises the fixing support, the jacking device comprises the buffering support etc.; or when the jacking device comprises the fixing support, the reciprocating impact part comprises the buffering support etc.; or when the frame comprises the fixing support, the reciprocating impact part comprises the buffering support etc.; a buffering device etc. is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; the buffering device com-

prises a structure guiding buffering device etc.; the structure guiding buffering device comprises a buffering element and a buffering guiding element etc.; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device etc.; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device etc.; the structure guiding buffering device absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structure guiding buffering device absorbs and buffers an impact reactive force of the impact head while guiding a buffering direction, thus preventing the rotation power source element or the jacking device or the frame etc. from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.

[0184] The guiding device is combined with the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device etc. to form two or more reciprocating impact parts; one end or two ends of the power impact element are provided with a damage-prevention mechanism etc.; the damage-prevention mechanism comprises a rotating structure or a split structure etc.; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type etc.; the rotating structure or the split structure etc. of the damage-prevention mechanism is matched with the guiding device; the power impact element drives the impact head to impact; an impact reactive damage force of the impact head on a coal wall or a rock wall is applied to the rotating structure or the split structure etc.; the rotating structure is stressed to rotate or the split structure isolates the impact reactive damage force in a split manner; the power impact element drives the impact head to impact; the impact reactive damage force of the impact head on the coal wall or the rock wall is applied to the guiding device, thus preventing the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device etc. from being damaged by the impact reactive damage force; the guiding device centralizes an impact direction of the impact head, thus ensuring that the next impact of the impact head is applied to an objected to be mined; the reciprocating impact part, or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element etc.; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor etc.; the jacking device or the reciprocating impact part or the frame comprises a fixing support and a buffering support etc.; or when the frame comprises the fixing support, the jacking device comprises the buffering support etc.; or when the jacking device comprises the fixing support, the reciprocating impact part comprises the buffering support etc.; or when the frame comprises the fixing support, the reciprocating impact part comprises the buffering support etc.; a buffering device is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part etc.; the buffering device comprises a rotation power buffering device and a structure guiding buffering device etc.; the rotation power buffering device is provided between the rotation power source element and the rotation impact transmission element or is provided in the rotation impact transmission element etc.; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering device or a belt buffering device etc.; the sliding stroke spline shaft housing buffering device comprises a spline shaft and a spline housing etc.; a sliding reciprocating stroke section etc. is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the belt buffering device comprises a driving pulley, a driven pulley and a belt etc.; the driving pulley is fixed on the fixing support; the driving pulley is connected with a drive shaft of the electric machine, the hydraulic motor, or the pneumatic motor etc.; the driven pulley is provided on the buffering support; the belt is provided on the driving pulley and the driven pulley; the driving pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force; the belt buffering device prevents the electric machine, the hydraulic motor, or the pneumatic motor etc. from being damaged; the structure guiding buffering device comprises a buffering element and a buffering guiding element etc.; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device etc.; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device etc.; the structure

guiding buffering device absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering device or the belt buffering device etc. to absorb and buffer an impact reactive force of the impact head and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame etc. from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.

[0185] The impact drive device comprises a crank impact drive device etc.; the crank impact drive device comprises the power impact element etc.; the guiding device and the crank impact drive device etc. are combined into two or more reciprocating impact parts; two or more reciprocating impact parts are provided at a front part of the jacking device or the frame; the guiding device comprises the guiding rollers, the guiding roller support and the impact guiding element etc.; the guiding roller is provided between the guiding roller support and the impact guiding element; the reciprocating impact part comprises a supporting box etc.; the crank impact driving device comprises a crank component etc.; the crank component drives the power impact element; the guiding device and the crank component are combined and provided in the supporting box; two ends of the impact guiding element extending out of the supporting box are provided with impact heads; or one end of the impact guiding element is provided with an impact head and the other end is provided with a counterweight element for preventing the impact head from being damaged with the guiding device, the impact drive device and/or the machine body etc. due to gravity unbalance or one end of the impact guiding element is provided with an impact head; an end of two or more power impact elements extending out of the supporting box is connected or separated with the impact head; the supporting box supports a crank component, the guiding device and the impact head etc.; the supporting box is provided at a front part of the jacking device or the frame; a guiding roller position-limiting structure etc. is provided on the guiding roller support or the impact guiding element; the guiding roller position-limiting structure limits a rolling space of the guiding rollers; the guiding rollers, the guiding roller support and the impact guiding element etc. are matched closely so that the guiding rollers provided in the guiding roller position-limiting structure support through rolling friction the impact guiding element to reciprocate and control an impact direction of the impact guiding element; one end or two ends of the power impact element are provided with a damage-prevention mechanism etc.; the damage-prevention mechanism comprises a rotating structure or a split structure etc.; the rotating structure of the damage-prevention mechanism comprises a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type etc.; the rotating structure or the split structure of the damage-prevention mechanism is matched with the guiding device; the power impact element drives the impact head to impact; an impact reactive damage force of the impact head on a coal wall or a rock wall is applied to the rotating structure or the split structure etc.; the rotating structure is stressed to rotate or the split structure isolates the reactive damage force in a split manner; the guiding device centralizes an impact direction of the impact head; the power impact element drives the impact head; the impact reactive damage force of the impact head on the coal wall or the rock wall is applied to the guiding device, thus preventing the impact drive device from being damaged by the impact reactive damage force; the reciprocating impact part, or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element etc.; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element etc.; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor etc.; the jacking device or the reciprocating impact part or the frame comprises a fixing support and a buffering support etc.; or when the frame comprises the fixing support, the jacking device comprises the buffering support etc.; or when the jacking device comprises the fixing support, the reciprocating impact part comprises the buffering support etc.; or when the frame comprises the fixing support, the reciprocating impact part comprises the buffering support etc.; a buffering device is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part etc.; the buffering device comprises a rotation power buffering device and a structure guiding buffering device etc.; the rotation power buffering device is provided between the rotation power source element and the rotation impact transmission element or is provided in the rotation impact transmission element; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering device or a belt buffering device etc.; the sliding stroke spline shaft housing buffering device comprises a spline shaft and a spline housing etc.; a sliding reciprocating stroke section etc. is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the belt buffering device comprises a driving pulley, a driven pulley and a belt etc.; the driving pulley is fixed on the fixing support; the driving pulley is connected with a drive shaft of the electric machine, the hy-

draulic motor, or the pneumatic motor etc.; the driven pulley is provided on the buffering support; the belt is provided on the driving pulley and the driven pulley; the driving pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force; the belt buffering device prevents the electric machine, the hydraulic motor, or the pneumatic motor etc. from being damaged; the structure guiding buffering device comprises a buffering element and a buffering guiding element etc.; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device etc.; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device etc.; the structure guiding buffering device absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering device or the belt buffering device etc. to absorb and buffer an impact reactive force of the impact head and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame etc. from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.

[0186] The reciprocating impact part comprises the guiding device, the impact drive device, the supporting box, and the impact head etc.; the supporting box supports the guiding device; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device etc.; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device etc. comprises the power impact element; the power impact element is provided in the supporting box; the power impact element and the impact head are connected, separated or integrated; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure etc.; the guiding device comprises the guiding roller support, the guiding rollers, and the impact guiding element etc.; the guiding roller support comprises a raceway etc.; the impact guiding element comprises a raceway etc.; the guiding rollers include rollers etc.; the rollers roll against the raceway; the impact guiding element is supported by the rollers to roll; the power impact element drives the impact head to impact; the rotating structure the damage-prevention mechanism is stressed to rotate or the split structure isolates a reactive damage force in a split manner; the guiding roller support, the impact guiding element and the rollers provided in the raceway etc. are matched closely to centralize an impact direction of the impact head and prevent the impact head from rotating; the power impact element does not guide the impact head and is not damaged by the damage force.

[0187] The reciprocating impact part comprises the guiding device and the impact drive device etc.; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device etc.; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device comprises the power impact element etc.; a damage-prevention mechanism etc. is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure etc.; the guiding device comprises the guiding roller support, and the impact guiding element etc.; the guiding roller support comprises a guiding roller support upper element, and a guiding roller support lower element etc.; the impact guiding element is a U-shaped impact guiding element etc.; the U-shaped impact guiding element comprises an impact guiding element upper element and a impact guiding element lower element etc.; a raceway etc. is provided in the guiding roller support upper element, and the guiding roller support lower element; or a raceway etc. is provided in the impact guiding element upper element and the impact guiding element lower element; or a raceway etc. is provided in the guiding roller support upper element, the guiding roller support lower element, the impact guiding element upper element and the impact guiding element lower element; the guiding roller is provided between the guiding roller support upper element and the impact guiding element upper element, and is provided between the guiding roller support lower element and the impact guiding element lower element and is provided in the raceway; the guiding rollers provided in the raceway, the U-shaped impact guiding element and the guiding roller support etc. are matched closely so that the guiding rollers support the U-shaped impact guiding element to reciprocate with rolling friction and control a reciprocating direction of the U-shaped impact guiding element and centralize an impact direction of the impact head; the U-shaped impact guiding element and the impact head are connected, separated or integrated; the power impact element and the impact head are connected or separated; the power impact element drives the impact head to impact; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element does not guide the impact head and is not damaged by the damage force.

[0188] The reciprocating impact part comprises the guiding device and the impact drive device etc.; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device etc.; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device comprises the power impact element etc.;

a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure etc.; the guiding device comprises an external sleeve, an internal body and the guiding rollers etc.; the internal body comprises an internal body upper element and an internal body lower element etc.; the external sleeve is a frame-shaped external sleeve etc.; the frame-shaped external sleeve comprises a frame-shaped external sleeve upper element and a frame-shaped external sleeve lower element etc.; the guiding roller is provided between the internal body upper element and the frame-shaped external sleeve upper element and is provided between the internal body lower element and the frame-shaped external sleeve lower element; the frame-shaped external sleeve, the internal body and the guiding rollers etc. are matched closely so that the guiding roller support supports the frame-shaped external sleeve to reciprocate with rolling friction and control a reciprocating direction of the frame-shaped external sleeve and centralizes an impact direction of the impact head; the frame-shaped external sleeve and the impact head are connected, separated or integrated; the power impact element and the impact head are connected or separated; the power impact element drives the impact head to impact; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element does not guide the impact head and is not damaged by the damage force.

[0189] The reciprocating impact part comprises the guiding device, the impact drive device, a supporting box, and the impact head etc.; the supporting box supports the guiding device; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device etc.; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device comprises the power impact element etc.; the power impact element is provided in the supporting box; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure etc.; the guiding device comprises a wear-resistant traveling wheel etc.; the wear-resistant traveling wheel comprises a rolling wheel, the guiding roller support and the impact guiding element etc.; the rolling wheel is provided on the guiding roller support; the power impact element and the impact guiding element are connected, separated or integrated; the power impact element is provided with a bump, a recess, a V groove or a curve etc. locked with the rolling wheel; the rolling wheel is provided at one side of the power impact element or is provided in the power impact element; the rolling wheel supports the power impact element to impact in a reciprocating manner with rolling friction while having a rolling guiding function; the power impact element drives the impact head to impact; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the impact guiding element, the guiding roller support and the rolling wheel etc. are matched closely to centralize an impact direction of the impact head; the power impact element does not guide the impact head and is not damaged by the damage force.

[0190] The impact drive device comprises a crank impact drive device, a hydraulic impact drive device or a pneumatic impact drive device etc.; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device comprises a power impact element etc.; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure etc.; the guiding device comprises a linear bearing etc. on which an impact guiding element is arranged; the power impact element and the impact head are connected, separated or integrated; the power impact element drives the impact head to reciprocate; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element does not guide the impact head and is not damaged by the damage force.

[0191] The box, the guiding device, the impact drive device and the impact head etc. are included; the box supports the guiding device; the guiding device comprises the impact guiding element, the rubbing body, and the rubbing body support etc.; the rubbing body comprises the roller and the suspender etc.; the roller comprises the guiding roller and/or the power roller etc.; the suspender comprises the guiding suspender and/or the power suspender etc.; the suspender comprises magnetic suspender, liquid suspender or gas suspender etc.; the guiding support comprises the guiding roller support or the guiding suspender support etc.; the box and the rubbing body support are separated, connected in a separated manner or integrated; an end of the impact guiding element extending out of the box is connected with the impact head; one end of the impact guiding element is provided with an impact head or two ends are provided with impact heads or one end is provided with an impact head while the other end is provided with a counterweight element; the impact guiding element and the impact head are connected or integrated; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device etc.; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises the power impact element and the power support etc.; the box and the power support are connected in a separated manner or integrated; the power support and the guiding support are separated, connected in a separated manner or integrated; the power support comprises the power roller support or the power suspender support etc.; the impact guiding element

and the power impact element are separated, connected in a split manner or integrated; the power impact element is provided in the box; the power impact element and the impact head are moveably connected or separated; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure etc.; the power impact element drives the impact head to impact; an impact damage force is applied on the damage-prevention mechanism; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates the impact reactive damage force in a split manner; the rubbing body are provided between the guiding support and the impact guiding element to form the guiding device; the rubbing body, the rubbing body support and the impact guiding element etc. are matched closely to support impact head to impact through rolling friction or suspension friction; the guiding device centralizes an impact direction of the impact head, thus preventing the impact drive device from being damaged by a damage force and an impact reactive force.

[0192] The jacking device comprises a rocker arm lifting mechanism etc.; a front part of the rocker arm lifting mechanism is provided with a supporting box etc.; the crank impact drive device comprises a transmission gear etc.; two sides of the transmission gear are provided with crank connecting rods etc.; a crank connecting rod at one side at least drives one impact head to impact; the crank connecting rods at two sides of the transmission gear impact simultaneously or impact alternatively; two or more ends of the supporting box are provided with the guiding support, the impact guiding element and the rubbing body etc.; the rubbing body etc. are provided between the guiding support and the impact guiding element to form a multi-point support impact head structure; the supporting box and the guiding support are connected in a separated manner or integrated; two or more impact guiding elements extend out of the box to connect the impact head; a connecting rod is connected, separated or integrated with the impact head; a damage-prevention mechanism etc. is provided at one end or two ends of the connecting rod; the connecting rod drives the impact head to reciprocate; two or more impact guiding elements centralize an impact direction of the impact head.

[0193] The present invention has the following beneficial effect:

1. the device is compact and simple in integral structure and convenient to use and operate; a material is fallen by an impact instead of being fallen by drilling milling and milling cutting, thus substantially eliminating damage caused by a lateral force on the reciprocating impact part, greatly reducing damage to components, improving production efficiency, and reducing material consumption; frictional loss is greatly reduced by rolling friction or suspension friction, thus saving power energy;
2. compared with an existing mining machine, the device does not completely crush a material, thus resulting in large lumpiness, low power consumption, less dust and a good working environment to improve the use value and economic value of the material;
3. the impact heads are provided at two sides of a front part of the jacking part to impact in a reciprocating manner so that a reactive force generated by an impact of the impact head at one side can be converted into impact power of the impact head at the other side; the impact power and the impact reactive force are applied reasonably, thus greatly reducing consumption of kinetic energy;
4. the working mode of the impact head is reciprocating straight line impacting, thus greatly reducing damage of the impact teeth compared with a drilling milling mode and a milling cutting mode, greatly prolonging the service life of the impact teeth, reducing the replacement frequency of the impact teeth, reducing consumption of easily-damaged parts of the device and improving working efficiency;
5. the guiding structure with high structural strength is especially capable of bearing and absorbing a powerful impact reactive force and twisting force, thus greatly improving the resistance of the mining machine on the impact reactive force and twisting force;
6. the guiding rollers are used in the device to support the rolling impact guiding element, thus greatly reducing damage on the impact guiding element caused by reciprocating impact and friction, and reducing consumption of kinetic energy; the guiding rubbing body support, the rolling impact guiding element and the guiding rollers are matched to ensure rolling guiding to the rolling impact guiding element, thus changing a structure that the guiding rollers only have a rolling friction function, but not have a guiding function, greatly reducing energy loss caused by sliding friction of the impact guiding element that needs to be centralized and reducing damage to the device;
7. the guiding device is provided with the guiding roller position-limiting structure, thus improving safe reliability of the device;
8. the guiding roller is provided in the retainer, or the raceway, or the pit or are provided between the external sleeve and the internal sleeve to enable the device to reciprocate with rolling friction; the guiding rollers have a rolling friction function, thus reducing frictional resistance during operation of the reciprocating impact part supported by sliding friction; the guiding rollers greatly increase absorption on an impact reactive force, thus realizing good running effect, simple structure, less easily-damaged parts, low production cost and stable performance;
9. the guiding roller is provided in the retainer, or the raceway, or the pit or are provided between the ex-

ternal sleeve and the internal sleeve, thus enabling the device to reciprocate with rolling friction while having a guiding function; the guiding rollers have a rolling friction function while having a guiding function, thus reducing frictional resistance during operation of the reciprocating impact part supported by sliding friction; the guiding rollers greatly increase absorption on an impact reactive force and have good guiding effect;

10. pits or retainers are provided in a rolling and reciprocating manner; the guiding roller is provided in the pits or the retainers; the pits or the retainers enable the guiding rollers to be provided at intervals so that the guiding rollers will not be extruded during operation and will not generate mutual reverse friction, thus greatly reducing energy loss, improving service life and reducing maintenance;

11. when the retainer is fixed to the rolling guiding device, the guiding roller is provided in the retainer and the raceway of the guiding rubbing body support; through rolling friction, the guiding rollers support the rolling impact guiding element to reciprocate, thus avoiding the problem of a failure in continuous working due to rotation of the guiding device, preventing the impact guiding element from deforming the guiding rubbing body support and reducing damage on the impact drive device;

12. the rolling wheel is provided between the guiding rubbing body support and the rolling impact guiding element in the device; the rolling wheel enables the rolling impact guiding element to have rolling friction, thus reducing wear of the guiding device and prolonging the service life, and realizing a low failure rate and less maintenance; the reciprocating speed is high with high efficiency because of rolling friction; at the same time, the rolling wheel is cleaner and more environment-friendly and harmful substances or poisonous gases etc. will not be generated by too much sliding friction, thus improving the quality of the working environment;

13. the damage-prevention mechanism is provided between the power impact element and the impact head of the impact drive device; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates a reactive damage force in a split manner, thus reducing damage of an impact reactive force on the power impact element and preventing the impact drive device from being damaged;

14. the supporting box is simple, rational, delicate and compact in structure, small in volume and light in weight with less wear, perfect function and strong resistance to a damage force and an impact reactive force;

15. the sealing element is provided at the moveable junction of the guiding device and the impact drive device with the supporting box so that that supporting box is a sealed structure, thus effectively preventing dust and material chips from entering the impact drive device and the guiding device, ensuring the purity of a lubricating liquid, reducing a frictional resistance, and avoiding corrosion of a material on the impact drive device and the guiding device; the lubricating system lubricates and cools the impact guiding device and the impact drive device, thus further reducing friction and prolonging the service life of the device;

16. the rubbing body, the impact guiding element and the rubbing body support in the device are matched closely to form a multi-point support guiding device; the impact guiding element in the device maximally increases a centralizing width to the impact head, strengthens centralizing on the impact head and maximally controls an impact direction of the impact head, which not only increases the length of an arm of force for damage prevention of the impact guiding element, but also reduces damage of the impact head to the impact guiding element, prevents the impact drive device from being damaged by a damage force and a reactive force and improves the service life of the device;

17. the U-shaped, frame-shaped, or cylindrical impact guiding element of the multi-point support guiding device is connected with the impact head so that the impact head and the rolling impact guiding element are connected at multiple points in a wide range, thus centralizing a reciprocating direction of the impact head and preventing the impact head from rotating;

18. the impact guiding element of the multi-point support guiding device is provided out of the cylinder, i.e. a connection width of the piston and the impact head is increased by extension and damage of the piston rod, thus the device meets various onsite requirements comprising high power strength, large twisting force and high drive frequency;

19. the buffering device is provided between the machine body and the reciprocating impact part or is provided between the jacking part and the reciprocating impact part of the device; when the reciprocating impact part works, an impact to a connecting element can be reduced effectively, thus preventing the connecting element from being loosened, avoiding fatigue damage on the connecting element, reducing an impact reactive force to the machine body, stabilizing traveling of the machine body and operation of the electric machine or the motor and improving the service life of the device;

20. the buffering element of the structure guiding buffering device is provided between the machine body and the jacking part, or is provided between the jacking part fixing support and the jacking part buffering support; the buffering guiding element is provided between the machine body and the jacking part or is provided between the jacking part fixing support and the jacking part buffering support; when

an impact reactive force is applied on the jacking part buffering support and the jacking part fixing support, or is applied on the machine body and the jacking part, the buffering element can be damaged to absorb the impact reactive force and the buffering guiding part controls a buffering direction so that buffering is reciprocating straight line buffering, thus preventing non-directional oscillating when the buffering element absorbs the impact reactive force; the buffering method and structure applied by the device do not cause damage shearing to the machine body and the reciprocating impact part, thus reducing impact on the travelling part and the machine body, greatly reducing a large number of mining failures, improving the service life of the machine body and improving the working efficiency;

21. the buffering element has a rebounding force to increase the impact effect;

when an impact reactive force is large, the buffering element can absorb and store impact energy and release the impact energy during the next impact period, thus further increasing an impact force to impact a material in a reciprocating manner;

22. the buffering guiding sleeve of the buffering device and the machine body are connected glidingly, thus increasing absorption of the buffering device on a reactive force generated by an impact on a coalbed or a rockbed;

23. the buffering guiding element, the buffering element and the buffering guiding sleeve of the device are matched with each other to form a bi-directional guiding structure buffering device; the jacking device is provided on the bi-directional guiding structure buffering device; the bi-directional guiding structure buffering device improves the buffering effect and effectively protects the device;

24. during a power transmission process, the spline shaft and the spline housing of the sliding stroke spline shaft housing buffering device are matched with each other to transmit power and slide in a reciprocating manner to buffer, thus an impact is only caused by a torque instead of being caused by an axial force, a good vibration isolation effect is realized, a dynamic sliding resistance is small during a mining process and the impact head is protected effectively; during an impact falling and impact vibration transmission process of the reciprocating impact part, the device decomposes an impact reactive force through reciprocating sliding buffering, thus protecting the power source element from being damaged, and greatly improving the service life and running reliability of the power source element;

25. the retaining element is provided on the jacking part fixing support and the jacking part buffering support, or is provided on the buffering guiding element and the buffering guiding sleeve; the retaining element can prevent the jacking part fixing support and the jacking part buffering support or the buffering guiding element and the buffering guiding sleeve from being detached during opposite reciprocating sliding; the retaining element is provided independently; the retaining element may be also integrated with the jacking part fixing support and the jacking part buffering support or the buffering guiding element and the buffering guiding sleeve, thus ensuring safe reliability of the buffering device;

26. the multi-throw crank is manufactured with a simple integral structure with sufficient rigidity and high strength to transmit a large rotation torque; the multi-throw crank is rational in structure and manufactured with a small volume to greatly lighten the reciprocating impact part and improve the adjusting flexibility of the reciprocating impact part;

27. the multi-throw crank is composed of multiple eccentric shafts; each eccentric shaft drives one power impact element; the other end of the power impact element is provided with one or more impact heads, thus greatly improving mining efficiency;

28. multi-throw crank, which is small in volume, may be installed between the upper impact guiding device and the lower impact guiding device so that one end of the impact guiding element can be provided with an impact head and the other end can be provided with a counterweight element; the counterweight element ensures gravitational equilibrium during an impact, reduces damage generated by gravity unbalance at the two ends during an impact of the impact guiding element and improves the stability of the device;

29. the multi-throw crank is used so that the impact head of the reciprocating impact part is simple and delicate and occupies a small space so that the power of the impact head can be concentrated, thus increasing the impact of a single impact head and the whole device can pass through a low rise area when mining a thin coalbed;

30. compared with reciprocating impact of two or more connecting rods driven by a gear transmission belt, the multi-throw crank can mine an thick to-be-mined object layer by layer, thus reducing an impact resistance of a non-delamination impact on the thick to-be-mined object, reducing damage caused by a relatively large generated impact reactive force on the reciprocating impact part and the machine body, reducing energy consumption during an energy transmission process and improving working efficiency;

31. the power concentric shaft section of the multi-throw crank thereon is provided with a liquid passage lubricating liquid channel, thus improving the wear resistance of the device, greatly reducing damage on a lubricated component and improving the service life of the power impact element;

32. after being manufactured integrally and treated thermally, the multi-throw crank has good working flexibility, good impact resistance and a relatively

high impact safety coefficient;

33. the eccentric shafts of the multi-throw crank are arranged symmetrically along an axial direction of the power concentric shaft section to form angle difference; power impact elements driven by the eccentric shafts can impact an coalbed or a rockbed in different periods of time; a reactive force generated during an impact of a power impact element can be converted into the power of the next power impact element at the same side; at the same time, a reactive force generated by one impact on a thick coalbed or rockbed is decomposed so that the impact drive device is stressed uniformly to buffer and stabilize the machine body;

34. the impact drive device applies a combination of belt transmission and gear transmission to effectively absorb a reactive force formed by an impact, thus greatly improving the service life of the power source element;

35. a suspension liquid, a suspension gas or a suspension magnet etc. is provided at a moveable friction location, thus effectively reducing friction between the impact guiding element and the impact guiding device so that a reciprocating movement is more flexible;

36. the power source element and the variable transmission component are provided on the jacking part outside the supporting box, thus greatly reducing the volume of the supporting box and simplifying the structure of the supporting box; the reciprocating impact part is simple in structure with less easily-damaged parts, the load at the front support of the jacking part is reduced and the consumption of a supporting force is reduced;

37. the reciprocating impact part of the device is provided at a front end or a side of the jacking part; a material is fallen through impact crushing; the rocker arm lifting oil cylinder drives the rocker arm to move up and down; the rotating disc drives the rocker arm to move left and right; the rotating disc and the rocker arm lifting oil cylinder are matched to adjust the impact head to impact a material at multiple positions in multiple directions, thus improving the impact working efficiency;

38. the vertical lifting mechanism can ensure that the reciprocating impact part impacts vertically, reduce the lengths of the jacking part and the machine body etc., reduce energy consumption and facilitate maintenance; a lifting track is linear, thus increasing lifting stability and improving the service life of a lifting support;

39. the device is provided with multi-layer impact teeth; the multi-layer impact teeth can make a coalbed or a rockbed into steps; the pressure stress and structural strength of the step-shaped coalbed or rockbed are greatly reduced compared with the original planar coalbed or rockbed; two opposite free surfaces of the step-shaped coalbed or rockbed are reasonably applied to impacting and falling a material when the impact teeth of each layer perform mining again, thus reducing an impact resistance, avoiding lumps of the material fallen by the impact head, improving working efficiency and reducing power consumption;

40. height difference is formed between the impact teeth of the multi-layer impact teeth so that the next impact may apply a free surface formed by a previous impact, thus reducing an impact resistance and lowering energy consumption; impact teeth with different lengths are formed into different step shapes according to different requirements, which is applicable to mining of different coalbeds or rockbeds;

41. the impact teeth of the impact head are multiple rows of impact teeth to impact a coalbed or a rockbed into steps while decomposing a fallen coal block or rock block to form grains applicable to transportation of a conveyor in one step, thus avoiding the problem of transportation difficulty due to oversize lumps during a mining process;

42. the impact tooth frame of the impact head is an arc-shaped plate, or a trapezoidal bracket, or a semicircular bracket, or a triangular bracket, or a conical bracket, or a flat plane bracket, or a frame-shaped bracket or a V-shaped bracket etc., thus improving the impact resistance of the impact tooth frame, increasing the width of the impact head and improving the impact efficiency on a coalbed or a rockbed;

43. the impact external layer material teeth and the impact internal layer material teeth of the impact head are matched with each other to form a multi-layer impact head; the impact external layer material frame of the impact head thereon is provided with the discharge hole so that a material fallen by the impact internal layer material teeth can pass smoothly; the structure of the multi-layer impact head solves that problem that a material clamped by the impact teeth cannot be discharged and the mining machine fails to mine continuously, thus implementing successful discharge and loading etc. of the mining machine and improving the mining efficiency;

44. multiple layers of impact teeth provided in parallel in the structure of the multi-layer impact head have different shapes, thus preventing a material clamped between the impact teeth from deforming the impact head, reducing a damping action on the impact drive device and better protecting the device; the impact external layer material teeth and the impact internal layer material teeth are matched with each other to reduce impact damage to the impact drive device and effectively reduce power consumption of the impact drive device impacting an over-high and over-wide coalbed or rockbed in one step;

45. multi-layer impact heads are arranged from the top down or from left to right etc., thus implementing mining layer by layer; the multi-layer impact heads impact to fall an object to be mined layer by layer,

thus reasonably utilizing the power of the device and ensuring the strength of the device;

46. the distances from the impact teeth at the front row and the impact teeth at the back row of the multi-layer impact head to the supporting box are different, thus greatly reducing the cutting depth of an impact of a single impact tooth when a coalbed or a rockbed is impacted, effectively decomposing a pressure stress of the coalbed or the rockbed, reducing an impact resistance, lowering power consumption and improving working efficiency;

47. the guiding support is provided at two or more ends of the power support to form two or more guiding support points; two or more guiding support points support the gravity of the reciprocating impact device; the rubbing body, the impact guiding element and the guiding support are matched closely to form a multi-point support reciprocating impact device structure; the multi-point support reciprocating impact device structure supports the reciprocating impact device at multiple points to centralize an impact direction of the reciprocating impact device; a connecting width of the reciprocating impact device and supporting on the reciprocating impact device are improved by two or more guiding support points;

48. two or more rows of rubbing bodies may be provided around one power impact element; two or more rows of rubbing bodies bear a gravitational load of the reciprocating impact device or the impact guiding element; at least one or more rubbing bodies in each row supports the reciprocating impact device to impact in a reciprocating manner, thus preventing centralized damage on the rubbing body caused by a gravitational load of the reciprocating impact device or the impact guiding element on only one row of rubbing bodies and the device is safer and more reliable;

49. the rubbing body support is integrated with the guiding support, or the impact guiding element, or the cylinder, or the piston, or the power support, or the power impact element, thus reducing a space occupied by the rubbing body support; the rubbing body support is integrated with the guiding support, or the impact guiding element, or the cylinder, or the piston, or the power support, or the power impact element to realize high structural strength and high space utilization; a limited space is used for increasing the volumes of the rubbing body, thus improving the bearing capacity of the rubbing body, increasing the contact area of the rubbing body with the corresponding components and avoiding an overlarge partial pressure and overlarge damage to the corresponding components due to undersize rubbing body;

50. the guiding rollers roll in a circulating manner in the circulating raceway, or roll in a reciprocating manner, or roll in situ to support the piston rod and the guiding roller support to reciprocate oppositely; or the piston rollers roll in a circulating manner in the circulating raceway, or roll in a reciprocating manner, or roll in situ to support the piston and the cylinder to reciprocate oppositely; the guiding rollers guide the cylinder rod through rolling friction; through rolling friction, the power rollers support the piston to reciprocate, thus reducing friction loss caused by supporting movements of the cylinder and the piston by sliding friction;

51. the rollers guide the impact guiding element through rolling friction; through rolling friction, the power rollers support the power impact element to reciprocate, thus reducing a frictional resistance and loss caused by supporting movements of the impact guiding element and the power impact element with sliding friction; the guiding rollers and the piston rollers use high-strength wear-resistant materials so that the device has long service life with little maintenance and high working efficiency;

52. the guiding roller support or the cylinder are provided as the internal body; the impact guiding element is provided as the external sleeve; the rollers are provided between the external sleeve and the internal body; the external sleeve, the internal body and the rollers are matched closely to support reciprocating of the external sleeve through rolling friction, thus reducing a frictional resistance of the external sleeve supported by sliding friction, greatly increasing absorption on an impact reactive force, and realizing good guiding effect, simple structure, less easily-damaged parts and stable performance;

53. the position-limiting structure is provided in the bracket, or the box, or the impact guiding element, or the power impact element, or the cylinder or the rubbing body; the position-limiting structure comprises the guiding position-limiting structure or the power position-limiting structure; the guiding rollers or the guiding suspenders are provided in the guiding position-limiting structure; the power rollers or the power suspenders are provided in the power position-limiting structure; the position-limiting structure limits a space and position of the rubbing bodes; the rubbing body support the impact guiding element or the power impact element or the cylinder to reciprocate;

54. the rubbing body supports the piston and the cylinder to reciprocate with rolling friction or suspension friction, thus changing the structure of reciprocating with sliding friction of the piston and the cylinder, reducing the height or thickness of the piston guiding section, reducing the weight of the piston, reducing energy consumption while reducing a running resistance of the piston, improving the running speed and improving the working efficiency of the drive device;

55. the piston is supported by the piston rollers to avoid the supporting function of the sealing element; the sealing element only has a sealing function, but not a supporting function, thus reducing the require-

ment on the rigidity of the sealing element; the sealing element can apply a relatively soft wear-resistant material, thus improving the wear resistance and the sealing service life of the sealing element; the sealing element may be also relatively thin to save material;

56. when the piston and the piston rollers are integrated, the piston may be made into a spherical piston and the cylinder is a circular cylinder; the spherical piston and the circular cylinder can form sealing; the spherical piston can divide the cavity into a pressure relief area and a pressure charging area without using the sealing element;

57. the surface of the rolling wheel may be widened so that the contact area of the rolling wheel and the power roller support, or the power impact element, or the guiding roller support, or the impact guiding element, or the cylinder or the piston is increased, centralizing on the width of the rolling wheel is strengthened and centralized partial wear is reduced;

58. the circulating raceway is provided on the roller support, or the impact guiding element, or the piston, or the cylinder, or the power impact element; the rollers fully fill the circulating raceway; the length of the circulating raceway enables the rollers to support rolling friction of a corresponding component, thus improving the rolling support amplitude and degree of the rollers, overcoming the defect of serious sliding friction existing in the original structure, and preventing damage caused by rolling support of the rollers on only a part of an area without partial collision friction of the rollers;

59. when the pressure-bearing section or the pressure-free section of the circulating raceway is provided in a separated manner, the pressure-free section of the circulating raceway is detachable, thus facilitating installation and maintenance of the circulating raceway and replacement of the rollers;

60. the pressure-bearing section of the circulating raceway is provided with a wear-resistant material or a high strength material, thus improving the wear resistance of the raceway, and improving the resistance of the raceway on a pressure and a frictional force between components; the wear-resistant material or the high strength material is provided partially, thus reducing the requirement on the integral wear resistance and strength of a corresponding component and reducing massive use of the wear-resistant material or the high strength material by the corresponding component;

61. the rolling pressure-bearing section of the impact guiding element, or the rolling pressure-bearing section of the roller support, or the rolling pressure-bearing section of the power impact element, or the rolling pressure-bearing section of the cylinder, or the rolling pressure-bearing section of the piston, or the rolling pressure-bearing section of the rollers is provided with a wear-resistant material or a high strength material, thus improving the wear resistance and the bearing capacity of a corresponding component; the rollers are arranged densely on the wear-resistant material or the high strength material to have a uniform extrusion force on the wear-resistant material or the high strength material and prevent the high strength and wear-resistant materials from being detached partially and being damaged;

62. the rubbing body is provided on a pressure-bearing friction area between the impact guiding element and the guiding support, or between the piston and the cylinder, or between the power impact element and the power support; a reciprocating impact frictional force and an extrusion force are applied on the rubbing body; the rubbing body reduces a frictional resistance and decomposes the extrusion force through rolling or suspension, thus greatly reducing the damage strength of the sliding frictional force and the extrusion force, reducing the requirement on the strength and toughness of a corresponding component compared with a sliding friction structure, and reducing the weight of the corresponding component; the impact guiding element, or the guiding support, or the piston, or the power impact element, or the power support may also use a light weight material to reduce energy consumption of reciprocating;

63. the device is provided with the centralizer so that the guiding rollers support the cylinder rod to reciprocate with rolling friction, thus changing the original cylinder structure to support a cylinder rod to reciprocate only by a sealing element; the guiding rollers centralize a moving direction of the cylinder rod, increases the length of the arm of an force for damage prevention and reduces damage of the cylinder rod to the sealing element, or the cylinder or the piston etc.;

64. a high strength wear-resistant material is applied to the guiding rollers and the piston rollers so that the device has long service life with little maintenance and high working efficiency;

65. the centralizer guides the cylinder rod through rolling to reduce damage of the cylinder rod on the sealing element; the sealing element can only have a sealing function, but not a supporting function, thus reducing the requirement on the rigidity of the sealing element; the sealing element can use a soft wear-resistant material, thus improving the wear resistance and the service life of the sealing element; the sealing element may be also relatively thin to save materials;

66. the guiding cylinder rod is provided outside the cylinder so that the cylinder rod is connected in a wide range at multiple points with other moving components to fully and effectively utilize a guiding action force of the cylinder rod; the device is applicable to various onsite using requirements comprising high power strength, large twisting force and high drive frequency;

67. one end or two ends of the piston rod are provided with the damage-prevention mechanism; the damage-prevention mechanism is matched with the centralizer; the damage-prevention mechanism may be also matched with the piston rollers, the cylinder and the piston to reduce damage on a corresponding component of the drive device;

68. the device, which is compactly structured with high structural strength, is applicable to working in a hostile environment, e.g. underground mining, cave excavation and tunnel support etc.; compared with the crank drive device, the device is small in volume, light in weight and simple in structure and may be also used in a working environment with a narrow space;

69. two ends of the impact guiding element are provided with an impact mechanism, or one end is provided with an impact mechanism while the other end is provided with a counterweight element, thus reducing damage during an impact of the impact guiding element due to gravity unbalance at two ends;

70. the guiding mechanism mainly applies rolling guiding or suspension guiding;

the rubbing body have rolling friction while having a rolling guiding function, thus reducing friction between the impact guiding element and the rubbing body support or between the power impact element and the power support during reciprocating impact and greatly reducing frictional loss caused by reciprocating impact;

71. compared with other impact power boxes, an efficient impact damage-prevention power box of the present invention has simple and convenient, rational, delicate and rigorous structure with small volume, light weight, little wear, perfect function, strong damage force and impact reactive force resistance, long service life and high production efficiency;

72. the rubbing body is provided in a pressure-bearing frictional area between the piston and the cylinder so that the rubbing body supports a reciprocating impact frictional force and an extrusion force through rolling or suspension; the reciprocating impact frictional force and the extrusion force are applied to the rubbing body; an frictional resistance is reduced and the extrusion force is decomposed through rolling or suspension, thus avoiding damage caused by the sliding frictional force and the extrusion force on the piston and the cylinder etc.; compared with a sliding friction structure, the requirement on the strength and toughness of the piston and the cylinder etc. is lowered; the shape and structure of the piston or the cylinder etc. are changed to reduce the material and the volume of the piston or the cylinder etc., reduce the weight of the piston and the cylinder etc. and reduce energy consumption etc. of piston reciprocating;

73. the rubbing body support is integrated with the piston, or the piston rod or the cylinder, thus reducing a space occupied by the rubbing body support; the rubbing body support is integrated with the piston or is integrated with the piston rod or is integrated with the cylinder to realize high structural strength and high space utilization; a limited space is used for increasing the volumes of the rubbing body, thus improving the bearing capacity of the rubbing body, increasing the contact area of the rubbing body with the piston, or the cylinder, or the piston rod, avoiding an overlarge partial pressure and overlarge damage to the piston, or the cylinder or the piston rod etc. due to undersize rubbing body, and realizing a simple structure, less easily-damaged parts, low manufacturing cost and long service life, and avoiding problems comprising complicated piston structure, easy damage, poor manufacturability and high manufacturing difficulty etc. caused by providing the rubbing body support separately, and the performance of an engine is greatly improved;

74. the impact guiding element is supported by the rubbing body to reciprocate with rolling friction or suspension friction, thus changing the original sliding friction structure, greatly reducing a running resistance of reciprocating impact of the mining machine, improving the reciprocating speed of the impact head, improving the working efficiency, greatly reducing power consumption, reducing the force load of other matched auxiliary elements, improving the service life of other auxiliary elements, and reducing related investment of the whole device; the wear-resistant efficient impact mining machine has a simple structure with high structural strength, high space utilization, reliable performance, strong manufacturability, easy processing and manufacturing, high running efficiency, energy conversation and consumption reduction, less maintenance and long service life.

Detailed Description of the Embodiments

[0194]

Fig. 1 is a front view of the embodiment 1;
Fig. 2 is a top view of the embodiment 1;
Fig. 3 is a structural diagram of a reciprocating impact part of the embodiment 1;
Fig. 4 is a front view of the embodiment 2;
Fig. 5 is a structural diagram of a reciprocating impact part of the embodiment 2;
Fig. 6 is a front view of the embodiment 3;
Fig. 7 is a structural diagram of a reciprocating impact part of the embodiment 3;
Fig. 8 is a structural diagram of a reciprocating impact part of the embodiment 4;
Fig. 9 is a structural diagram of a reciprocating impact part of the embodiment 5;
Fig. 10 is a front structural view of a reciprocating impact part of the embodiment 6;

Fig. 11 is a left structural view of a reciprocating impact part of the embodiment 6;
Fig. 12 is a structural diagram of a reciprocating impact part of the embodiment 7;
Fig. 13 is a sectional view of a guiding device of the embodiment 7;
Fig. 14 is a structural diagram of a reciprocating impact part of the embodiment 8;
Fig. 15 is a sectional view of a guiding device of the embodiment 8;
Fig. 16 is a structural sectional view of a power impact element of the embodiment 8;
Fig. 17 is a structural view of a reciprocating impact part of the embodiment 9;
Fig. 18 is a structural sectional view of a power impact element of the embodiment 9;
Fig. 19 is a structural diagram of a reciprocating impact part of the embodiment 10;
Fig. 20 is a sectional view of a guiding device of the embodiment 10;
Fig. 21 is a front view of the embodiment 11;
Fig. 22 is a sectional view of A-A in Fig. 21;
Fig. 23 is a front view of the embodiment 12;
Fig. 24 is a structural diagram of a reciprocating impact part of the embodiment 13;
Fig. 25 is a structural diagram of a reciprocating impact part of the embodiment 14;
Fig. 26 is a structural diagram of a reciprocating impact part of the embodiment 15;
Fig. 27 is a structural diagram of a reciprocating impact part of the embodiment 16;
Fig. 28 is a structural diagram of a reciprocating impact part of the embodiment 17;
Fig. 29 is a structural diagram of a reciprocating impact part of the embodiment 18;
Fig. 30 is structural diagram of a reciprocating impact part of the embodiment 19;
Fig. 31 is a structural diagram of a reciprocating impact part of the embodiment 20;
Fig. 32 is a structural diagram of a reciprocating impact part of the embodiment 21;
Fig. 33 is a structural diagram of a reciprocating impact part of the embodiment 22;
Fig. 34 is a structural diagram of a reciprocating impact part of the embodiment 23;
Fig. 35 is a structural diagram of a reciprocating impact part of the embodiment 24;
Fig. 36 is a structural diagram of a reciprocating impact part of the embodiment 25;
Fig. 37 is a structural diagram of a reciprocating impact part of the embodiment 26;
Fig. 38 is a structural diagram of a reciprocating impact part of the embodiment 27;
Fig. 39 is a front view of the embodiment 28;
Fig. 40 is a structural diagram of a reciprocating impact part of the embodiment 29;
Fig. 41 is a structural diagram of a reciprocating impact part of the embodiment 30;
Fig. 42 is a structural diagram of a deformation-prevention mechanism of the embodiment 30;
Fig. 43 is a structural diagram of a reciprocating impact part of the embodiment 31;
Fig. 44 is a structural diagram of a reciprocating impact part of the embodiment 32;
Fig. 45 is a structural diagram of a jacking part of the embodiment 33;
Fig. 46 is a top view of the embodiment 34;
Fig. 47 is a top view of a reciprocating impact part of the embodiment 34;
Fig. 48 is a front view of the embodiment 35;
Fig. 49 is a structural diagram of a rocker arm of the embodiment 36;
Fig. 50 is a front view of the embodiment 37;
Fig. 51 is a front view of the embodiment 38;
Fig. 52 is a structural diagram of a reciprocating impact part of the embodiment 38;
Fig. 53 is a structural diagram of a buffering device of the embodiment 39;
Fig. 54 is a structural diagram of a buffering device of the embodiment 40;
Fig. 55 is a structural diagram of a buffering guiding element of the embodiment 40;
Fig. 56 is a structural diagram of a buffering guiding element of the embodiment 41;
Fig. 57 is a structural diagram of a rocker arm of the embodiment 42;
Fig. 58 is a structural diagram of a rocker arm of the embodiment 43;
Fig. 59 is a front view of the embodiment 44;
Fig. 60 is a structural diagram of a reciprocating impact part of the embodiment 44;
Fig. 61 is a front view of the embodiment 45;
Fig. 62 is a structural diagram of a reciprocating impact part of the embodiment 45;
Fig. 63 is a structural diagram of an impact drive device of the embodiment 46;
Fig. 64 is a top view of the embodiment 47;
Fig. 65 is a top view of the embodiment 48;
Fig. 66 is a top view of the embodiment 49;
Fig. 67 is a front view of the embodiment 50;
Fig. 68 is a front view of the embodiment 51;
Fig. 69 is a top view of the embodiment 51;
Fig. 70 is a structural diagram of a vertical lifting mechanism of the embodiment 51;
Fig. 71 is a structural diagram of a vertical lifting mechanism of the embodiment 52;
Fig. 72 is a structural diagram of a vertical lifting mechanism of the embodiment 53;
Fig. 73 is a front view of the embodiment 54;
Fig. 74 is a sectional view of an impact guiding element of the embodiment 54;
Fig. 75 is a structural diagram of a reciprocating impact part of the embodiment 55;
Fig. 76 is a sectional view of a cylinder of the embodiment 55;
Fig. 77 is a structural diagram of a reciprocating im-

pact part of the embodiment 56;
Fig. 78 is a sectional view of a cylinder of the embodiment 56;
Fig. 79 is a front view of the embodiment 57;
Fig. 80 is a front view of the embodiment 58;
Fig. 81 is a front view of the embodiment 59;
Fig. 82 is a structural diagram of a reciprocating impact part of the embodiment 60;
Fig. 83 is a structural diagram of a reciprocating impact part of the embodiment 61;
Fig. 84 is a structural diagram of a reciprocating impact part of the embodiment 62;
Fig. 85 is a structural diagram of a reciprocating impact part of the embodiment 63;
Fig. 86 is a front view of the embodiment 64;
Fig. 87 is a structural diagram of a reciprocating impact part of the embodiment 65;
Fig. 88 is a sectional view of an impact guiding element of the embodiment 65;
Fig. 89 is a sectional view of an impact guiding element of the embodiment 66;
Fig. 90 is a sectional view of an impact guiding element of the embodiment 67;
Fig. 91 is a structural view of a reciprocating impact part of the embodiment 68;
Fig. 92 is a sectional view of an impact guiding element of the embodiment 68;
Fig. 93 is a front view of the embodiment 69;
Fig. 94 is a structural diagram of a reciprocating impact part of the embodiment 69;
Fig. 95 is a sectional view of an impact guiding element of the embodiment 69;
Fig. 96 is a structural diagram of a reciprocating impact part of the embodiment 70;
Fig. 97 is a structural diagram of a reciprocating impact part of the embodiment 71;
Fig. 98 is a sectional view of an impact guiding element of the embodiment 71;
Fig. 99 is a front view of the embodiment 72;
Fig. 100 is a front view of the embodiment 73;
Fig. 101 is a structural diagram of a guiding roller of the embodiment 73;
Fig. 102 is a front view of the embodiment 74;
Fig. 103 is a structural diagram of a reciprocating impact part of the embodiment 74;
Fig. 104 is a structural diagram of a jacking part of the embodiment 74;
Fig. 105 is a front view of the embodiment 75;
Fig. 106 is a top structural view of a reciprocating impact part of the embodiment 75;
Fig. 107 is a front structural view of a reciprocating impact part of the embodiment 75;
Fig. 108 is a partial structural diagram of a guiding device of the embodiment 75;
Fig. 109 is a front structural view of a reciprocating impact part of the embodiment 76;
Fig. 110 is a front structural view of a reciprocating impact part of the embodiment 77;
Fig. 111 is a front structural view of a reciprocating impact part of the embodiment 78;
Fig. 112 is a sectional view of a guiding device of the embodiment 78;
Fig. 113 is a front structural view of a reciprocating impact part of the embodiment 79;
Fig. 114 is a front structural view of a reciprocating impact part of the embodiment 80;
Fig. 115 is a structural diagram of a reciprocating impact part of the embodiment 81;
Fig. 116 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 117 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 118 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 119 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 120 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 121 is a partial structural diagram of a guiding device of the embodiment 82;
Fig. 122 is a sectional view of A-A in Fig. 121;
Fig. 123 is a partial structural view of a guiding device of the embodiment 82;
Fig. 124 is a sectional view of A-A in Fig. 123;
Fig. 125 is a partial structural diagram of a guiding device of the embodiment 82;
Fig. 126 is a sectional view of A-A in Fig. 125;
Fig. 127 is a partial structural view of a guiding device of the embodiment 82;
Fig. 128 is a sectional view of A-A in Fig. 127;
Fig. 129 is a partial structural diagram of a guiding device of the embodiment 82;
Fig. 130 is a sectional view of A-A in Fig. 129;
Fig. 131 is a partial structural diagram of a guiding device of the embodiment 82;
Fig. 132 is a sectional view of A-A in Fig. 131;
Fig. 133 is a partial structural diagram of a guiding device of the embodiment 82;
Fig. 134 is a sectional view of A-A in Fig. 133;
Fig. 135 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 135 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 136 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 137 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 138 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 139 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 140 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 141 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 142 is a sectional view of a position-limiting

structure of the embodiment 82;
Fig. 143 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 144 is a sectional view of a position-limiting structure of the embodiment 82;
Fig. 145 is a partial structural diagram of a guiding device of the embodiment 83;
Fig. 146 is a sectional view of A-A in Fig. 145;
Fig. 147 is a sectional view of a position-limiting structure of the embodiment 83;
Fig. 148 is a structural diagram of a reciprocating impact part of the embodiment 84;
Fig. 149 is a structural diagram of a reciprocating impact part of the embodiment 85;
Fig. 150 is a structural diagram of an impact drive device of the embodiment 85;
Fig. 151 is a structural diagram of a reciprocating impact part of the embodiment 86;
Fig. 152 is a structural diagram of an impact drive device of the embodiment 86;
Fig. 153 is a front view of the embodiment 87;
Fig. 154 is a structural diagram of a reciprocating impact part of the embodiment 87;
Fig. 155 is a sectional view of A-A in Fig. 154;
Fig. 156 is a structural diagram of a reciprocating impact part of the embodiment 88;
Fig. 157 is a front view of the embodiment 89;
Fig. 158 is a structural diagram of a reciprocating impact part of the embodiment 89;
Fig. 159 is a sectional view of A-A in Fig. 158;
Fig. 160 is a structural diagram of a reciprocating impact part of the embodiment 90;
Fig. 161 is a structural diagram of a reciprocating impact part of the embodiment 91;
Fig. 162 is a structural diagram of a reciprocating impact part of the embodiment 92;
Fig. 163 is a structural view of a reciprocating impact of the embodiment 93;
Fig. 164 is a structural diagram of a reciprocating impact of the embodiment 94;
Fig. 165 is a structural diagram of a reciprocating impact of the embodiment 95;
Fig. 166 is a structural diagram of a circulating raceway of the embodiment 95;
Fig. 167 is a sectional view of a piston of the embodiment 95;
Fig. 168 is a structural diagram of a reciprocating impact part of the embodiment 96;
Fig. 169 is a sectional view of A-A in Fig. 167;
Fig. 170 is a structural view of a reciprocating impact part of the embodiment 97;
Fig. 171 is a structural view of a reciprocating impact part of the embodiment 98;
Fig. 172 is a structural view of a reciprocating impact part of the embodiment 99;
Fig. 173 is a structural view of a reciprocating impact part of the embodiment 100;
Fig. 174 is a structural view of a hydraulic or pneumatic or solid flowing impact drive device of the embodiment 101;
Fig. 175 is a front view of the embodiment 102;
Fig. 176 is a structural diagram of a reciprocating impact part of the embodiment 102;
Fig. 177 is a structural diagram of a piston of the embodiment 103; and
Fig. 178 is a sectional view of a piston of the embodiment 103.

[0195] In the drawings:

1-machine body; 2-travelling part; 3-reciprocating impact part; 4-impact drive device, 4.1-power impact element; 4.2-crank impact drive device; 4.3-power support; 4.4-cylinder; 4.5-piston; 4.6-control element; 4.7-airbag; 4.8-power roller; 4.9-cylinder; 5-guiding device; 5.1-impact guiding element; 5.1.1-guiding section; 5.2-guiding support; 5.2.1-guiding support upper element; 5.2.2-guiding support lower element; 5.3-guiding roller; 5.3.1-rolling wheel; 5.3.2-axis of rolling wheel; 5.3.3-rolling shaft; 5.4-roller; 6-impact head; 6.1-impact external layer material teeth; 6.2-impact internal layer material teeth; 6.3-step tooth impact cutting mechanism; 6.3.1-impact teeth; 6.4-impact external layer material tooth frame; 6.5-impact external layer material teeth; 6.6-imapct internal layer material tooth frame; 6.7-impact internal layer material teeth; 6.8-discharge hole; 6.9-impact material tooth frame; 6.9.1-back supporting base; 6.9.2-material impact tooth supporting frame; 7-counterweight element; 8-supporting frame; 9-jacking device; 9.1-rocker arm; 9.1.1-main rocker arm; 9.1.2-secondary rocker arm; 9.2-lifting oil cylinder; 9.3-crushing device; 9.4-guiding device; 9.5-fixing support; 9.6-buffering support; 9.7-buffering element; 9.8-buffering guiding element; 9.9-guiding lug boss; 9.10-retaining element; 9.11-power source element; 9.12-rotation impact transmission element; 10-rotating disc; 11-shovel plate; 12-conveyor; 13-supporting box; 14-sealing element; 15-hood; 16-guiding position-limiting structure, 16.1-pit; 16.2-raceway; 16.3-retainer; 16.4-reciprocating stroke section; 16.5-position-limiting ring; 16.6-position-limiting platform; 16.7-oval position-limiting structure; 16.8-dumbell-shaped position-limiting structure; 16.9-circular column-shaped position-limiting structure; 16.10-conical position-limiting structure; 16.11-rolling wheel position-limiting structure; 16.12-square position-limiting structure; 16.13-U-shaped position-limiting structure; 16.14-frame-shaped position-limiting structure; 16.15-1-shaped position-limiting structure; 17-damage-prevention mechanism; 17.1-arc-shaped catching groove type damage-prevention mechanism; 17.1.1-arc-shaped raised head; 17.1.2-groove; 17.2-ball cage type universal joint damage-prevention mechanism; 17.3-cross universal joint damage-prevention mecha-

nism; 17.4-split structure damage-prevention mechanism; 17.5-ball end catching groove type damage-prevention mechanism; 18-angle adjuster; 19-frame; 20-sliding stroke spline shaft housing buffering structure; 20.1-spline shaft; 20.2-spline housing; 12-belt buffering structure; 21.1-driving pulley; 21.2-driven pulley; 21.3-belt; 21.4-belt tensioning device; 22-multi-throw crank multi-rod impact mechanism; 22.1-multi-throw crank; 22.1.1-power concentric shaft section; 22.1.2-connecting handle; 22.1.3-eccentric shaft; 22.2-connecting rod; 23-vertical lifting mechanism; 23.1-lifting platform; 23.2-lifting platform support; 23.3-vertical lifting driver; 23.4-locating locker; 24-translaton device; 25-rotation-prevention structure; 26-external sleeve; 26.1-external sleeve upper element; 26.2-external sleeve lower element; 26.3-cylindrical external sleeve; 27-internal body; 27.1-frame-shaped internal body upper element; 27.2-frame-shaped internal body lower element; 28-U-shaped impact guiding element; 28.1-impact guiding element upper element; 28.2-impact guiding element lower element; 29-cam shaft; 30-cam; 31-crank; 32-slider; 33-oscillating bar; 34-connecting rod; 35-bearing; 36-guiding element hood; 37-liquid channel; 38-rubbing body; 39-rubbing body support; 40-liquid suspender; 40.1-liquid medium source; 40.2-control valve; 40.3-transmission pipeline; 40.4-liquid cavity; 41-gas suspender; 41.1-gas source; 41.2-gas cavity; 42-magnetic suspender; 42.1-N pole permanent magnet; 42.2-S pole permanent magnet; 42.3-cathode electromagnet; 42.4-anode electromagnet; 43-linear bearing; 44-transmission gear; 45-circulating raceway; 45.1-annular circulating raceway; 45.2-spiral circulating raceway; 45.3-circulating supporting section; 45.4-circulating section; 45.5-pressure-bearing circulating raceway; 45.6-pressure-free circulating raceway.

Detailed Description of the Embodiments

Embodiment 1

[0196] As shown in Fig. 1 to Fig. 3, a wear-resistant impact mining machine, the rolling friction impact mining machine comprises a machine body 1, a travelling part 2, and a reciprocating impact part 3 etc.; the reciprocating impact part 3 comprises a guiding device 5 and an impact drive device 4 etc.; the guiding device 5 and the impact drive device 4 are separated; the guiding device 5 comprises an impact guiding element 5.1, guiding rollers 5.3 and a guiding support 5.2 etc.; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; one end of the impact guiding element 5.1 is provided with an impact head 6 and the other end is provided with a counterweight element 7 for preventing the impact head 6 from damaging the guiding device 5, the impact drive device 4 and/or the machine body 1 etc. due to gravity unbalance; the impact head 6 is connected with the impact guiding element 5.1; the impact drive device 4 comprises a power impact element 4.1 etc.; the power impact element 4.1 drives the impact guiding element 5.1 to reciprocate; the impact guiding element 5.1 drives the impact head 6 to impact a coal wall or a rock wall to fall a material; the power impact element 4.1 and the impact guiding element 5.1 are separated; the machine body 1 comprises a frame 19 etc.; the machine body 1 thereon is not provided with a jacking device; the reciprocating impact part 3 is provided on the frame 19; the traveling part 2 is provided at a lower part of the machine body 1 and drives the machine body 1 to travel;

the guiding rollers 5.3 or the guiding support 5.2 or the impact guiding element 5.1 or power rollers 4.8 or the power impact element 4.1 is a high strength wear-resistant material; the high strength wear-resistant material is a hard alloy or wear-resistant plastics or wear-resistant steel or wear-resistant rubber or wear-resistant ceramics or a self-lubricating wear-resistant material etc.;

the guiding device 5 and the impact drive device 4 may be also integrated;

impact heads 6 may be also provided on two ends of the impact guiding element 5.1; the impact head 6 at the front performs impact mining and the impact head 6 at the back functions as a standby head and is configured to balance the weight of the impact head at the front; an impact head may be also provided at only one end;

the power impact element 4.1 and the impact guiding element 5.1 may be also connected or integrated;

the impact head 6 and the impact guiding element 5.1 may be also integrated;

the machine body may be also provided with a jacking device etc.; the jacking device is provided on the frame;

the machine body moves forwards or backwards to perform coal mining;

the device is compact and simple in integral structure and convenient to use and operate; a material is fallen by an impact instead of being fallen by drilling milling, thus substantially eliminating damage caused by a lateral force on the reciprocating impact part, greatly reducing damage to components, improving production efficiency, and reducing material consumption; frictional loss is greatly reduced by rolling friction, thus saving power energy;

compared with an existing drilling milling tunneling machine, the device does not completely crush a material, thus resulting in large lumpiness, low power consumption, less dust and a good working environment to improve the use value and economic value of the material;

the impact heads are provided at two sides of a front part of the jacking part to impact in a reciprocating manner so that a reactive force generated by an impact of the impact head at one side can be converted into impact power of the impact head at the other side; the impact power and the impact reactive force are applied reasonably, thus greatly reducing consumption of kinetic energy;

the working mode of an impact head is reciprocating straight line impacting, thus greatly reducing damage of impact teeth compared with a drilling milling mode, greatly prolonging the service life of the impact teeth, reducing the replacement frequency of the impact teeth, reducing consumption of easily-damaged parts of the device and improving working efficiency;
the guiding rollers are used in the device to support the impact guiding element, thus greatly reducing damage on the impact guiding element caused by reciprocating impact and friction, and reducing consumption of kinetic energy;
the other end of the impact head is provided with a counterweight; the counterweight ensures gravitational equilibrium during an impact, reduces damage at two ends during an impact of the impact guiding element due to gravity unbalance and improves the stability of the device.

Embodiment 2

[0197] As shown in Fig. 4 to Fig. 5, a wear-resistant impact mining machine, the rolling friction impact mining machine comprises a machine body 1, a travelling part 2, and a reciprocating impact part 3 etc.; the reciprocating impact part 3 comprises a guiding device 5 and an impact drive device 4 etc.; the guiding device 5 and the impact drive device 4 are integrated; the guiding device 5 comprises an impact guiding element 5.1, guiding rollers 5.3 and a guiding support 5.2 etc.; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; two ends of the impact guiding element 5.1 are provided with impact heads 6 etc.; the impact heads 6 and the impact guiding element 5.1 are integrated; the impact drive device 4 comprises a power impact element 4.1 etc.; the power impact element 4.1 drives the impact guiding element 5.1 to reciprocate; the impact guiding element 5.1 drives the impact heads 6 to impact a coal wall or a rock wall to fall a material; the power impact element 4.1 and the impact guiding element 5.1 are integrated; the machine body 1 comprises a frame 19 etc.; the machine body 1 thereon is provided with a jacking device 9 etc.; the reciprocating impact part 3 is provided on the jacking device 9; the jacking device 9 is provided on the frame 19; the traveling part 2 is provided at a lower part of the machine body 1 and drives the machine body 1 to travel;
the guiding rollers 5.3 or the guiding support 5.2 or the impact guiding element 5.1 or power rollers 4.8 or the power impact element 4.1 is a high strength wear-resistant material; the high strength wear-resistant material is a hard alloy or wear-resistant plastics or wear-resistant steel or wear-resistant rubber or wear-resistant ceramics or a self-lubricating wear-resistant material etc.;
the jacking device 9 comprises a rocker arm 9.1; the machine body 1 comprises a rotating disc 10; the rocker arm 9.1 is provided on the rotating disc 10; the rotating disc 10 drives the rocker arm 9.1 to rotate at a front part of the machine body 1; the jacking device 9 comprises a rocker arm lifting oil cylinder 9.2; one end of the rocker arm lifting oil cylinder 9.2 is fixed on the rotating disc 10 and the other end is connected with the rocker arm 9.1;
the rocker arm lifting oil cylinder 9.2 drives the rocker arm 9.1 to move up and down;
the machine body 1 further comprises a shovel plate 11 etc.; the shovel plate 11 thereon is provided with a star wheel setting claw or a crab claw setting claw etc.; the middle of the machine body 1 is provided with a conveyor 12; the conveyor 12 comprises a scraper conveyor, a belt 21.3 conveyor or an armored belt conveyor etc.; the shovel plate 11 collects a material mined by the reciprocating impact part 3 to the conveyor 12; the conveyor 12 transports the material to a back part of the machine body 1;
the machine body 1 further comprises a control device, a dragging cable device, an atomizing device, a water spraying device or a cooling device etc.;
to realize better usage effect, avoid generating a material with large lumpiness and guide the material to a proper position, the frame 19 or the jacking device 9 comprises a crushing device 9.3 or a guiding device 9.4 etc.; the machine body moves forwards or backwards to perform coal mining;
the device is compact and simple in integral structure and convenient to use and operate; a material is fallen by an impact instead of being fallen by drilling milling, thus substantially eliminating damage caused by a lateral force on the reciprocating impact part, greatly reducing damage to components, improving production efficiency, and reducing material consumption; frictional loss is greatly reduced by rolling friction, thus saving power energy;
compared with an existing drilling milling tunneling machine, the device does not completely crush a material, thus resulting in large lumpiness, low power consumption, less dust and a good working environment to improve the use value and economic value of the material;
the impact heads are provided at two sides of a front part of the jacking device to impact in a reciprocating manner so that a reactive force generated by an impact of the impact head at one side can be converted into impact power of the impact head at the other side; the impact power and the impact reactive force are applied reasonably, thus greatly reducing consumption of kinetic energy;
the working mode of an impact head is reciprocating straight line impacting, thus greatly reducing damage of impact teeth compared with a drilling milling mode, greatly prolonging the service life of the impact teeth, reducing the replacement frequency of the impact teeth, reducing consumption of easily-damaged parts of the device and improving working efficiency;
the guiding rollers are used in the device to support the impact guiding element, thus greatly reducing damage on the impact guiding element caused by reciprocating impact and friction, and reducing consumption of kinetic

energy.

Embodiment 3

[0198] As shown in Fig. 6 to Fig. 7, a wear-resistant impact mining machine comprises a machine body 1, a travelling part 2, a jacking device 9 and a reciprocating impact part 3 etc.; the reciprocating impact part 3 comprises a guiding device 5 and an impact drive device 4 etc.; the impact drive device 4 comprises a crank impact drive device 4.2 or a hydraulic impact drive device or a pneumatic impact drive device etc.; the crank impact drive device 4.2 or the hydraulic impact drive device or the pneumatic impact drive device comprises a power impact element 4.1 etc.; the guiding device 5 comprises a guiding support 5.2, an impact guiding element 5.1 and guiding rollers 5.3 etc.; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; one end of the impact guiding element 5.1 is provided with an impact head 6 and the other end is provided with a counterweight element 7 for preventing the impact head 6 from damaging the guiding device 5, the impact drive device 4, the jacking device 9 and/or the machine body 1 etc. due to gravity unbalance; the power impact element 4.1 and the impact head 6 are connected or separated; the guiding device 5 is combined with the crank impact drive device 4.2 or the hydraulic impact drive device or the pneumatic impact drive device etc. in the jacking device 9; the jacking device 9 is provided on the machine body 1; a lower part of the machine body 1 is provided with a travelling part 2 etc.; the guiding rollers 5.3, the guiding support 5.2 and the impact guiding element 5.1 are matched closely so that the guiding rollers 5.3 support through rolling friction the impact guiding element 5.1 to reciprocate; an impact direction of the impact guiding element 5.1 is controlled through rolling friction, thus avoiding the impact guiding element 5.1 from being damaged by sliding friction; the impact guiding element 5.1 supports the impact head 6 to reciprocate with rolling friction; the power impact element 4.1 drives the impact head 6 to impact; an impact reactive damage force of the impact head 6 on a coal wall or a rock wall is applied to the guiding device 5; the guiding device 5 centralizes an impact direction of the impact head 6; the travelling part 2 drives the machine body 1 to travel to implement reciprocating impact and continuous mining;
the guiding device 5 and the impact drive device 4 may be also integrated;
impact heads 6 may be also provided on two ends of the impact guiding element 5.1; the impact head 6 at the front performs impact mining and the impact head 6 at the back functions as a standby head and balances the weight of the impact head 6 at the front; an impact head 6 may be also provided at one end;
the impact head 6 and the impact guiding element 5.1 may be also integrated;
the guiding rollers are used in the device to support the impact guiding element, thus greatly reducing damage on the impact guiding element caused by reciprocating impact and friction, and reducing consumption of kinetic energy; the guiding support, the impact guiding element and the guiding rollers are matched to ensure rolling guiding to the impact guiding element, thus changing a structure that the guiding rollers only have a rolling friction function, but not have a guiding function, greatly reducing loss of energy caused by sliding friction of the impact guiding element that needs to be centralized and reducing damage to the device;
the remaining is the same as the embodiment 2.

Embodiment 4

[0199] As shown in Fig. 8, a wear-resistant impact mining machine, the guiding device 5 comprises a guiding support 5.2 and an impact guiding element 5.1 etc.; one end of the impact guiding element 5.1 is provided with an impact head 6 and the other end is provided with a counterweight element 7; the guiding device 5 further comprises a guiding section 5.1.1 etc.; the guiding section 5.1.1 is provided on the impact guiding element 5.1; two ends of the guiding section 5.1.1 besides an overlapped section with the impact guiding element 5.1 are equal or substantially equal in weight; the guiding section 5.1.1 and the impact guiding element 5.1 are integrated; the guiding section 5.1.1 is provided on the guiding support 5.2; the guiding section 5.1.1 is always located on the guiding support 5.2 while moving, thus maintaining gravity balance of the two ends of the impact guiding element 5.1 in a static state or a moving state; the guiding support 5.2 and the impact guiding element 5.1 are matched closely to support the impact guiding element 5.1 to reciprocate; a power impact element 4.1 drives the impact head 6 or the impact guiding element 5.1 to reciprocate; the power impact element 4.1 and the impact guiding element 5.1 are separated; the impact head 6 is supported by the impact guiding element 5.1 to reciprocate; the impact head 6 impacts a coal wall or a rock wall to fall a material;
impact heads 6 etc. may be also provided at two ends of the impact guiding element 5.1;
the guiding section 5.1.1 and the impact guiding element 5.1 may be also connected in a separated manner;
the power impact element 4.1 and the impact guiding element 5.1 may be also a connected structure or integrated;
by applying such a structure, gravity balance of the impact head and the impact guiding element etc. can be maintained when moving to reduce an impact to the guiding device due to unbalance, thus improving running stability and reduce noise;
the remaining is the same as the embodiment 2.

Embodiment 5

[0200] As shown in Fig. 9, a wear-resistant impact mining machine, two ends of the impact guiding element 5.1

are provided with impact heads 6 etc.; a guiding section 5.1.1 and the impact guiding element 5.1 are connected in a separated manner; the guiding section 5.1.1 is provided on a guiding support 5.2, the guiding section 5.1.1 is always located on the guiding support 5.2 when moving, thus maintaining gravity balance of two ends of the impact guiding element 5.1 in a static state or a moving state;
the remaining is the same as the embodiment 4.

Embodiment 6

[0201] As shown in Fig. 10 to Fig. 11, a wear-resistant impact mining machine comprises a machine body 1, a jacking device 9, a travelling part 2 and a reciprocating impact part 3 etc.; the reciprocating impact part 3 comprises an impact drive device 4 and a guiding device 5 etc.; the impact drive device 4 comprises a crank impact drive device 4.2 etc.; the crank impact drive device 4.2 comprises a power impact element 4.1 etc.; the reciprocating impact part 3 further comprises a supporting box 13 or a supporting frame 8 etc.; the supporting box 13 or the supporting frame 8 thereon is provided with a guiding position-limiting structure 16 etc.; the guiding position-limiting structure 16 limits an impact guiding element 5.1 to reciprocate in a straight line; the impact guiding element 5.1 supports an impact head 6 to reciprocate with rolling friction; the impact guiding element 5.1 supports the impact head 6 to reciprocate with rolling friction; the power impact element 4.1 drives the impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the guiding device 5;
the supporting box 13 is completely sealed or partially sealed; the supporting box 13 or the supporting frame 8 comprises a sealing element 14 etc.; the sealing element 14 is provided at a moveable junction of the impact drive device 4 or the guiding device 5 and the supporting box 13; or the sealing element 14 is provided at a moveable junction of the impact drive device 4 or the guiding device 5 and the supporting frame 8;
the junction of the power impact element 4.1 and the impact head 6 is provided with an impact element hood 15; or a guiding element hood is provided at the junction of the impact guiding element 5.1 and the impact head 6; the power impact element 4.1 and the impact head 6 are connected or separated; the impact guiding element 5.1 and the impact head 6 are connected or integrated;
the sealing element 14 is provided between the impact element hood 15 or the guiding element hood and the supporting box 13;
the sealing element 14 is provided between the impact guiding element 5.1 and the guiding support 5.2 or is provided between the power impact element 4.1 and a power support 4.3; the impact guiding element 5.1 and the power impact element 4.1 are separated or integrated; the guiding support 5.2 and the power support 4.3 are separated or integrated;
the sealing element 14 comprises a sealing cavity or a sealing fin or a sealing plug or a sealing ring etc.;
the material of the sealing element 14 is a rubber material, a polyurethane material, a nylon material, a plastic material, a metal material or a mixed material etc.
the impact drive device 4 may also comprise a hydraulic impact drive device or a pneumatic impact drive device etc.;
the guiding device is provided with a guiding roller position-limiting structure etc. to improve the safe reliability of the device;
the supporting box is simple, rational, delicate and compact in structure, small in volume and light in weight with less wear, perfect function and strong resistance to a damage force and an impact reactive force;
the remaining is the same as the embodiment 2.

Embodiment 7

[0202] As shown in Fig. 12 to Fig. 13, a wear-resistant impact mining machine comprises a machine body 1, a jacking device 9, a travelling part 2 and a reciprocating impact part 3 etc.; the reciprocating impact part 3 comprises an impact drive device 4 and a guiding device 5 etc.; the impact drive device 4 comprises a power support 4.3 and a power impact element 4.1 etc.; the guiding device 5 comprises a guiding support 5.2, an impact guiding element 5.1 and guiding rollers 5.3 etc.; the guiding rollers 5.3 comprise rolling wheels 5.3.1 etc.; the rolling wheels 5.3.1 are provided between the guiding support 5.2 and the impact guiding element 5.1; a rolling wheel 5.3.1 comprises a rolling wheel axis 5.3.2 etc.; the rolling wheel axis 5.3.2 is fixed to the guiding support 5.2; the rolling wheels 5.3.1 roll against the impact guiding element 5.1, thus preventing fitting friction between the guiding support 5.2 and the impact guiding element 5.1;
the rolling wheel axis 5.3.2 may be also fixed to the impact guiding element 5.1; the rolling wheels 5.3.1 roll against the guiding support 5.2;
the rolling wheels 5.3.1 may be also provided between the power support 4.3 and the power impact element 4.1; when the rolling wheel axis 5.3.2 is fixed to the power impact element 4.1, the rolling wheels 5.3.1 roll against the power support 4.3; when the rolling wheel axis 5.3.2 is fixed to the power support 4.3, the rolling wheels 5.3.1 roll against the power impact element 4.1;
the rolling wheels are provided between the guiding support and the impact guiding element in the device; the rolling wheels enable the impact guiding element to have rolling friction, thus reducing wear of the guiding device and prolonging the service life, and realizing a low failure rate and less maintenance; the reciprocating speed is high with high efficiency because of rolling friction; at the same time, the rolling wheels are cleaner and more environment-friendly and harmful substances or poisonous gases etc. will not be generated by too much sliding friction, thus improving the quality of the working environment;

the remaining is the same as the embodiment 2.

Embodiment 8

[0203] As shown in Fig. 14 to Fig. 16, a wear-resistant impact mining machine, the guiding device 5 comprises a guiding support 5.2, an impact guiding element 5.1 and guiding rollers 5.3 etc.; the guiding rollers 5.3 comprise rolling wheels 5.3.1 etc.; the rolling wheels 5.3.1 are provided between a power support 4.3 and a power impact element 4.1 and are provided between the guiding support 5.2 and the impact guiding element 5.1; a rolling wheel 5.3.1 comprises a rolling wheel axis 5.3.2 etc.; the rolling wheel axis 5.3.2 is fixed to the power support 4.3; the rolling wheels 5.3.1 roll against the power impact element 4.1, thus preventing fitting friction between the power impact element 4.1 and the power support 4.3 to reduce wear to an impact drive device 4; the rolling wheel axis 5.3.2 is fixed to the impact guiding element 5.1; the rolling wheels 5.3.1 roll against the guiding support 5.2, thus preventing fitting friction between the guiding support 5.2 and the impact guiding element 5.1;
the rolling wheel axis 5.3.2 may be also fixed to the power impact element 4.1 and the rolling wheels 5.3.1 roll against the power support 4.3;
when the rolling wheel axis 5.3.2 may be also fixed to the guiding support 5.2, the rolling wheels 5.3.1 roll against the impact guiding element 5.1;
the remaining is the same as the embodiment 7.

Embodiment 9

[0204] As shown in Fig. 17 to Fig. 18, a wear-resistant impact mining machine, an impact drive device 4 comprises a power support 4.3 and a power impact element 4.1 etc.; a guiding device 5 comprises a guiding support 5.2, an impact guiding element 5.1 and guiding rollers 5.3 etc.; the guiding rollers 5.3 comprise rolling wheels 5.3.1 etc.; the rolling wheels 5.3.1 are provided between a power support 4.3 and a power impact element 4.1; a rolling wheel 5.3.1 comprises a rolling wheel axis 5.3.2 etc.; the rolling wheel axis 5.3.2 is fixed to the power support 4.3; the rolling wheels 5.3.1 roll against the power impact element 4.1; the surfaces of the rolling wheels 5.3.1 are made into V groove shapes; the shape of a contact surface between the power impact element 4.1 and the rolling wheels 5.3.1 is locked with the shape of the surfaces of the rolling wheels 5.3.1, thus preventing fitting friction between the power impact element 4.1 and the power support 4.3 and reducing wear of the drive device 4;
the rolling wheels 5.3.1 may be also provided between the guiding support 5.2 and the impact guiding element 5.1; when the rolling wheel axis 5.3.2 is fixed to the guiding support 5.2, the rolling wheels 5.3.1 roll against the impact guiding element 5.1; when the rolling wheel axis 5.3.2 is fixed to the impact guiding element 5.1, the rolling wheels 5.3.1 roll against the guiding support 5.2;
the rolling wheels 5.3.2 may be also fixed to the power impact element 4.1 and the rolling wheels 5.3.1 roll against the power support 4.3;
the surfaces of the rolling wheels 5.3.1 may be also made into a bump, a recess or a curve etc.;
the rolling wheels are provided between the guiding support and the impact guiding element in the device; the rolling wheels enable the impact guiding element to have rolling friction, thus reducing wear of the guiding device and prolonging the service life, and realizing a low failure rate and less maintenance; the reciprocating speed is high with high efficiency because of rolling friction; at the same time, the rolling wheels are cleaner and more environment-friendly and harmful substances or poisonous gases etc. will not be generated by too much sliding friction, thus improving the quality of the working environment;
the remaining is the same as the embodiment 7.

Embodiment 10

[0205] As shown in Fig. 19 to Fig. 20, a wear-resistant impact mining machine, an impact drive device 4 comprises a power support 4.3 and a power impact element 4.1 etc.; a guiding device 5 comprises a guiding support 5.2, an impact guiding element 5.1 and guiding rollers 5.3 etc.; the guiding rollers 5.3 comprise rolling wheels 5.3.1 etc.; the rolling wheels 5.3.1 are provided between the guiding support 5.2 and the impact guiding element 5.1; a rolling wheel 5.3.1 comprises a rolling wheel axis 5.3.2 etc.; the rolling wheel axis 5.3.2 is fixed to the impact guiding element 5.1, the rolling wheels 5.3.1 roll against the guiding support 5.2, thus preventing fitting friction between the guiding support 5.2 and the impact guiding element 5.1; the surfaces of the rolling wheels 5.3.1 are made into a curve; the shape of a contact surface between the guiding support 5.2 and the rolling wheels 5.3.1 is locked with the shape of the surfaces of the rolling wheels 5.3.1; the rolling wheels 5.3.1, the guiding support 5.2 and the impact guiding element 5.1 are matched closely to control through rolling friction a movement of the impact guiding element 5.1 and the power impact element 4.1 to be a straight line reciprocating movement;
the rolling wheels 5.3.1 may be also provided between the power support 4.3 and the power impact element 4.1;
the surfaces of the rolling wheels 5.3.1 may be also made into a bump, a V groove shape or a recess etc.;
the remaining is the same as the embodiment 9.

Embodiment 11

[0206] As shown in Fig. 21 to Fig. 22, a wear-resistant impact mining machine, an impact drive device 4 comprises a crank impact drive device 4.2 etc.; the crank impact drive device 4.2 comprises a power impact element 4.1 etc.; a guiding device 5 comprises guiding rollers 5.3, a guiding support 5.2 and an impact guiding element 5.1 etc.; the guiding rollers 5.3 are provided be-

tween the guiding support 5.2 and the impact guiding element 5.1; the impact guiding element 5.1 thereon is provided with an impact head 6; the power impact element 4.1 and the impact head 6 are connected or separated; the guiding support 5.2 is provided as an internal body 27; the impact guiding element 5.1 is provided as an external sleeve 26; the guiding rollers 5.3 are provided between the external sleeve 26 and the internal body 27; the external sleeve 26, the internal body 27 and the guiding rollers 5.3 are matched closely to reciprocate oppositely through rolling friction of the guiding rollers 5.3; the guiding support 5.2 supports the guiding rollers 5.3 and the reciprocating external sleeve 26; the impact head 6 and the reciprocating external sleeve 26 are integrated or connected; the impact head 6 is supported by the reciprocating external sleeve 26 to reciprocate with rolling friction; the power impact element 4.1 drives the impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the guiding device 5, thus preventing the crank impact drive device 4.2 from being damaged by the impact reactive damage force; the guiding device 5 centralizes an impact direction of the impact head 6, thus ensuring that the next impact of the impact head 6 is applied to an object to be mined; the travelling part 2 drives the machine body 1 to travel to implement reciprocating impact and continuous mining;
the impact drive device 4 may also apply a hydraulic impact drive device or a pneumatic impact drive device etc.;
the guiding support may be also provided as an external sleeve while the impact guiding element may be provided as an internal body;
compared with a rotating bearing and other rolling friction devices, the guiding roller is provided between the external sleeve and the internal body so that the device implements a rolling friction reciprocating movement while having a guiding function; the guiding rollers have a rolling friction function while having a guiding function, thus reducing a frictional resistance during running of the reciprocating impact part supported by sliding friction; the guiding rollers greatly improve the absorption on the impact reactive force and realize a good guiding effect;
the remaining is the same as the embodiment 2.

Embodiment 12

[0207] As shown in Fig. 23, a wear-resistant impact mining machine, an impact drive device 4 comprises a hydraulic impact drive device or a pneumatic impact drive device etc.; the hydraulic impact drive device or the pneumatic impact drive device comprises a power impact element 4.1 etc.; a guiding device 5 comprises guiding rollers 5.3, a guiding support 5.2 and an impact guiding element 5.1 etc.; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; the impact guiding element 5.1 thereon is provided with an impact head 6 etc.; the power impact element 4.1 and the impact head 6 are connected or separated; the guiding support 5.2 is provided as an external sleeve 26; the impact guiding element 5.1 is provided as an internal body 27; the guiding rollers 5.3 are provided between the external sleeve 26 and the internal body 27; the external sleeve 26, the internal body 27 and the guiding rollers 5.3 are matched closely to reciprocate oppositely through rolling friction of the guiding rollers 5.3; the guiding support 5.2 supports the guiding rollers 5.3 and the reciprocating internal body 27; the impact head 6 and the reciprocating internal body 27are integrated or connected; the impact head 6 is supported by the reciprocating internal body 27 to reciprocate with rolling friction; the power impact element 4.1 drives the impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the guiding device 5, thus preventing the hydraulic impact drive device or the pneumatic impact drive device etc. from being damaged by the impact reactive damage force; the guiding device 5 centralizes an impact direction of the impact head 6, thus ensuring that the next impact of the impact head 6 is applied to an object to be mined; the travelling part 2 drives the machine body 1 to travel to implement reciprocating impact and continuous mining;
the impact drive device 4 may also apply a crank impact drive device 4.2 etc.;
the guiding support may be also provided as an internal body while the impact guiding element is provided as an external sleeve;
the remaining is the same as the embodiment 11.

Embodiment 13

[0208] As shown in Fig. 24, a wear-resistant impact mining machine, an impact drive device 4 is a crank impact drive device 4.2; the crank impact drive device 4.2 further comprises a crank component and a power component etc.; a guiding device 5 and the crank component of the crank impact drive device 4.2 are combined and provided in a jacking device 9; when the guiding device 5 and the crank component of the crank impact drive device 4.2 are combined and provided at a front part of the jacking device 9, the power component of the crank impact drive device 4.2 is provided on the jacking device 9 or the machine body 1; the crank impact drive device 4.2 comprises a bracket etc.; the bracket comprises a power support 4.3 and a guiding support 5.2 etc.; the guiding support 5.2 is provided outside the power support 4.3; the power support 4.3 and the guiding support 5.2 are integrated; the crank impact drive device 4.2 comprises a power impact element 4.1 etc.; the power impact element 4.1 is provided in the bracket; the bracket supports the power impact element 4.1; an impact guiding element 5.1 is provided outside the bracket; the impact guiding element 5.1 outside the bracket is connected with an impact head 6; the power impact element 4.1 is connected or separated with the impact head 6; the power impact element 4.1 drives the impact head 6 or the impact

guiding element 5.1 to impact; the impact guiding element 5.1 and the guiding support 5.2 are matched closely to form a multi-point support guiding device 5; the multi-point support guiding device 5 supports an impact of the impact head 6 at multiple points;
the impact drive device 4 may also apply a hydraulic impact drive device or a pneumatic impact drive device etc.;
the power support 4.3 and the guiding support 5.2 may be also separated;
the guiding rollers, the impact guiding element and the guiding support in the device are matched closely to form a multi-point support guiding device; the impact guiding element in the device maximally increases a centralizing width to the impact head, strengthens centralizing on the impact head and maximally controls an impact direction of the impact head, which not only increases the length of an arm of force for damage prevention of the impact guiding element, but also reduces damage of the impact head to the impact guiding element, prevents the impact drive device from being damaged by a damage force and a reactive force and improves the service life of the device;
the remaining is the same as the embodiment 2.

Embodiment 14

[0209] As shown in Fig. 25, a wear-resistant impact mining machine, an impact drive device 4 comprises a hydraulic impact drive device or a pneumatic impact drive device etc.; a guiding device 5 and the hydraulic impact drive device or the pneumatic impact drive device are combined and provided in a jacking device 9; the hydraulic impact drive device comprises a cylinder 4.4 part etc. or the pneumatic impact drive device comprises a cylinder 4.4 part etc.; the cylinder 4.4 part comprises a power support 4.3 and a guiding support 5.2 etc.; the guiding support 5.2 is provided outside the power support 4.3; the power support 4.3 and the guiding support 5.2 are integrated; the cylinder 4.4 part comprises a cylinder 4.4. etc.; the cylinder 4.4 is separated or integrated with the power support 4.3; the guiding support 5.2. is provided outside the cylinder 4.4; the guiding support 5.2 and the cylinder 4.4 are separated or integrated; a crank impact drive device 4.2, or the hydraulic impact drive device or the pneumatic impact drive device comprises a power impact element 4.1. etc.; the power impact element 4.1 is provided in the bracket or the cylinder 4.4; the bracket or the cylinder 4.4. supports the power support 4.1; the impact guiding element 5.1 is provided outside the bracket or the cylinder 4.4; the impact guiding element 5.1 outside the bracket or the impact guiding element 5.1 outside the cylinder 4.4 is connected with the impact head 6; the power impact element 4.1 and the impact head 6 are connected or separated; the power impact element 4.1 drives the impact head 6 or the impact guiding element 5.1 to impact; the impact guiding element 5.1 and the guiding support 5.2 are matched closely to form a multi-point support guiding device 5; the multi-point support guiding device 5 supports at multiple points the impact head 6 to impact;
the impact drive device 4 may also apply a hydraulic impact drive device or a pneumatic impact drive device etc.;
the power support 4.3 and the guiding support 5.2 may be also separated;
the remaining is the same as the embodiment 13.

Embodiment 15

[0210] As shown in Fig. 26, a wear-resistant impact mining machine comprises a machine body 1, a jacking device 9, a travelling part 2, and a reciprocating impact part 3 etc.; the reciprocating impact part 3 comprises an impact drive device 4 and a guiding device 5 etc.; the impact drive device 4 comprises a hydraulic impact drive device or a pneumatic impact drive device etc.; the hydraulic impact drive device comprises a cylinder 4.4 part etc. or the pneumatic impact drive device comprises a cylinder 4.4 part etc.; the cylinder 4.4 part comprises a power support 4.3 and a guiding support 5.2 etc.; the guiding support 5.2 is provided outside the power support 4.3; the power support 4.3 and the guiding support 5.2 are integrated; the cylinder 4.4 part comprises a cylinder 4.4. etc.; the cylinder 4.4 is separated or connected or integrated with the power support 4.3; the guiding support 5.2 is provided outside the cylinder 4.4; the guiding support 5.2 and the cylinder 4.4 are separated or connected or integrated; the hydraulic impact drive device or the pneumatic impact drive device comprises a power impact element 4.1. etc.; the power impact element 4.1 is provided in the cylinder 4.4; guiding rollers 5.3 are provided between the cylinder 4.4. and the power impact element 4.1; the cylinder 4.4 supports the power impact element 4.1 through the guiding rollers 5.3; the guiding rollers 5.3 are provided outside a supporting frame 8 or are provided outside the cylinder 4.4; an impact guiding element 5.1 is provided outside the cylinder 4.4; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1 and is provided between the power support 4.3 and the power impact element 4.1; the impact guiding element 5.1 outside the cylinder 4.4 is connected with the impact head 6; the power impact element 4.1 and the impact head 6 are connected or separated; the power impact element 4.1 drives the impact head 6 and/or the impact guiding element 5.1 to impact; the guiding rollers 5.3 and the impact guiding element 5.1 are matched closely with the guiding support 5.2, the guiding rollers 5.3, the power support 4.3 and the power impact element 4.1 to form a multi-point support guiding device 5; the multi-point support guiding device 5 supports an impact of the impact head 6 through rolling friction;
the impact drive device 4 may also apply a driving impact drive device 4 etc.;
the power support 4.3 and the guiding support 5.2 may be also separated or connected;
the remaining is the same as the embodiment 2.

Embodiment 16

[0211] As shown in Fig. 27, a wear-resistant impact mining machine, an impact drive device 4 applies a crank impact drive device 4.2; the crank impact drive device 4.2 comprises a supporting frame 8 etc.; the supporting frame 8 comprises a power support 4.3 and a guiding support 5.2 etc.; the guiding support 5.2 is provided outside the power support 4.3; the power support 4.3 and the guiding support 5.2 are integrated; the crank impact drive device 4.2 comprises a power impact element 4.1 etc.; the power impact element 4.1 is provided in the supporting frame 8; guiding rollers 5.3 are provided between the supporting frame 8 and the power impact element 4.1; the supporting frame 8 supports the power impact element 4.1; the impact guiding element 5.1 is provided outside the supporting frame 8; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; the impact guiding element 5.1 outside the supporting frame 8 are connected with the impact head 6; the power impact element 4.1 is connected or separated with impact head 6 at two ends; the power impact element 4.1 drives the impact heads 6 and/or the impact guiding element 5.1 to impact; the guiding rollers 5.3 and the impact guiding element 5.1 are matched closely with the guiding support 5.2, the guiding rollers 5.3, the power impact element 4.1 and the power support 4.3 to form a multi-point support guiding device 5; the multi-point support guiding device 5 supports an impact of the impact heads 6 through rolling friction;
the remaining is the same as the embodiment 15.

Embodiment 17

[0212] As shown in Fig. 28, a wear-resistant impact mining machine, an impact drive device 4 is a crank impact drive device 4.2; a guiding support 5.2 thereon is provided with pits 16.1 etc.; the pits 16.1 limit a rolling space and position of guiding rollers 5.3; the guiding rollers 5.3 are provided between the guiding support 5.2, and an impact guiding element 5.1 and are provided in the pits 16.1; the guiding support 5.2, the impact guiding element 5.1 and the guiding rollers 5.3 rolling in the pits 16.1 are locked closely to enable the impact guiding element 5.1 to reciprocate through rolling friction of the guiding rollers 5.3; a reactive damage force generated by an impact of an impact head 6 on a coal wall or a rock wall is applied to a guiding device 5, thus preventing the crank impact drive device 4.2, or a hydraulic impact drive device or a pneumatic impact drive device etc. from being damaged by the impact reactive damage force; the guiding device 5 centralizes an impact direction of the impact head 6, thus ensuring that the next impact of the impact head 6 is applied to an object to be mined;
the impact drive device 4 may also apply a hydraulic impact drive device or a pneumatic impact drive device etc.;
the impact guiding element 5.1 thereon is provided with pits16.1 etc.;
the guiding device is provided with the pits; the guiding roller is provided in the pits; the pits enable the guiding rollers to be arranged at interval; compared with an existing linear bearing, the guiding rollers will not be extruded when running, thus avoiding reverse friction, greatly reducing energy loss, improving service life and reducing maintenance;
the remaining is the same as the embodiment 2.

Embodiment 18

[0213] As shown in Fig. 29, a wear-resistant impact mining machine, an impact drive device 4 is a crank impact drive device 4.2; an impact guiding element 5.1 thereon is provided with pits 16.1 etc.; the pits 16.1 limit a rolling space and position of guiding rollers 5.3; the guiding rollers 5.3 are provided between a guiding support 5.2, and the impact guiding element 5.1 and are provided in the pits 16.1; the guiding support 5.2, the impact guiding element 5.1 and the guiding rollers 5.3 rolling in the pits 16.1 are locked closely to enable the impact guiding element 5.1 to reciprocate through rolling friction of the guiding rollers 5.3; a reactive damage force generated by an impact of an impact head 6 on a coal wall or a rock wall is applied to a guiding device 5, thus preventing the crank impact drive device 4.2, or a hydraulic impact drive device or a pneumatic impact drive device etc. from being damaged by the impact reactive damage force; the guiding device 5 centralizes an impact direction of the impact head 6, thus ensuring that the next impact of the impact head 6 is applied to an object to be mined;
the impact drive device 4 may also apply a hydraulic impact drive device or a pneumatic impact drive device etc.;
the remaining is the same as the embodiment 17.

Embodiment 19

[0214] As shown in Fig. 30, a wear-resistant impact mining machine, the impact drive device 4 is a crank impact drive device 4.2; the guiding device 5 comprises an impact guiding element 5.1, guiding rollers 5.3 and a guiding support 5.2 etc.; the guiding support 5.2 thereon is provided with a raceway 16.2 etc.; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1 and are provided in the raceway 16.2; the raceway 16.2 limits a rolling space and position of the guiding rollers 5.3; the guiding support 5.2, the impact guiding element 5.1 and the guiding rollers 5.3 rolling in the raceway 16.2 are locked closely to enable the impact guiding element 5.1 to reciprocate through rolling friction of the guiding rollers 5.3;
the impact drive device 4 may also apply a hydraulic impact drive device or a pneumatic impact drive device etc.;
the impact guiding element 5.1 thereon may be also provided with a raceway 16.2 or the impact guiding support 5.2 and the impact guiding element 5.1 thereon are both provided with a raceway 16.2;
compared with a rotating bearing and other rolling friction

devices, the guiding roller is provided in the raceway to enable the device to reciprocate with rolling friction; the guiding rollers have a rolling friction function, thus reducing frictional resistance during operation of the reciprocating impact part supported by sliding friction; the guiding rollers greatly increase absorption on an impact reactive force, thus realizing good running effect, simple structure, less easily-damaged parts, low production cost and stable performance;
the remaining is the same as the embodiment 2.

Embodiment 20

[0215] As shown in Fig. 31, a wear-resistant impact mining machine, the impact drive device 4 is a hydraulic impact drive device or a pneumatic impact drive device; a guiding device 5 comprises an impact guiding element 5.1, guiding rollers 5.3, and a guiding support 5.2 etc.; the impact guiding element 5.1 thereon is provided with a raceway 16.2 etc.; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1 and are provided in the raceway 16.2; the raceway 16.2 limits a rolling space and position of the guiding rollers 5.3; the guiding support 5.2, the impact guiding element 5.1, and the guiding rollers 5.3 rolling in the raceway 16.2 are locked closely to enable the impact guiding element 5.1 to reciprocate through rolling friction of the guiding rollers 5.3;
the impact drive device 4 may also apply a crank impact drive device 4.2 etc.;
the guiding support thereon may be also provided with a raceway, or the guiding support and the impact guiding element thereon are both provided with a raceway;
the remaining is the same as the embodiment 19.

Embodiment 21

[0216] As shown in Fig. 32, a wear-resistant impact mining machine, the impact drive device 4 is a crank impact drive device 4.2; the guiding device 5 comprises an impact guiding element 5.1, guiding rollers 5.1 and a guiding support 5.2 etc.; the guiding support 5.2 and the impact guiding element 5.1 thereon are both provided with a raceway 16.2 etc.; the guiding roller is provided between the guiding support 5.2 and the impact guiding element 5.1 and are provided in the raceway 16.2; the raceway 16.2 limits a rolling space and position of the guiding rollers 5.3; the guiding support 5.2, the impact guiding element 5.1 and the guiding rollers 5.3 rolling in the raceway 16.2 are locked closely to enable the impact guiding element 5.1 to reciprocate through rolling friction of the guiding rollers 5.3;
the impact drive device 4 may also apply a hydraulic impact drive device or a pneumatic impact drive device etc.;
the remaining is the same as the embodiment 19.

Embodiment 22

[0217] As shown in Fig. 33, a wear-resistant impact mining machine, the impact drive device 4 is a crank impact drive device 4.2; a guiding device 5 comprises guiding rollers 5.3, a guiding support 5.2, an impact guiding element 5.1, and a retainer 16.3 etc.; the retainer 16.3 is provided between the guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1 and are provided in the retainer 16.3; the thickness of the retainer 16.3 is smaller than the diameter of the guiding rollers 5.3; two parts of the guiding rollers 5.3 higher than the retainer 16.3 are respectively provided in the guiding support 5.2 and the impact guiding element 5.1; the guiding support 5.2, the impact guiding element 5.1 and the guiding rollers 5.3 rolling in the retainer 16.3 are matched closely so that the impact guiding element reciprocates through rolling friction; the retainer 16.3 limits a rolling space and position of the guiding rollers 5.3; the retainer 16.3 is provided separately;
the impact drive device 4 may also apply a hydraulic impact drive device or a pneumatic impact drive device etc.;
the retainer 16.3 may be fixed to the guiding support 5.2 or the impact guiding element 5.1 etc.;
compared with a rotating bearing and other rolling friction devices, the guiding roller is provided in the retainer to enable the device to reciprocate with rolling friction; the guiding rollers have a rolling friction function, thus reducing frictional resistance during operation of the reciprocating impact part supported by sliding friction; the guiding rollers greatly increase absorption on an impact reactive force, thus realizing good running effect, simple structure, less easily-damaged parts, low production cost and stable performance;
the remaining is the same with the embodiment 2.

Embodiment 23

[0218] As shown in Fig. 34, a wear-resistant impact mining machine, the impact drive device 4 is a crank impact drive device 4.2; a guiding device 5 comprises guiding rollers 5.3, a guiding support 5.2, an impact guiding element 5.1, and a retainer 16.3 etc.; the retainer 16.3 is fixed to the impact guiding element 5.1;
the retainer 16.3 may be also fixed to the guiding support 5.2 etc.;
the remaining is the same as the embodiment 22.

Embodiment 24

[0219] As shown in Fig. 35, a wear-resistant impact mining machine, the impact drive device 4 is a crank impact drive device 4.2; a guiding device 5 comprises guiding rollers 5.3, a guiding support 5.2, an impact guiding element 5.1, and a retainer 16.3 etc.; the retainer 16.3 is fixed to the guiding support 5.2;
the remaining is the same as the embodiment 22.

Embodiment 25

[0220] As shown in Fig. 36, a wear-resistant impact mining machine, the guiding device 5 comprises guiding rollers 5.3, a guiding support 5.2, an impact guiding element 5.1, and a retainer 16.3 etc.; the retainer 16.3 is provided between the guiding support 5.2 and the impact guiding element 5.1; the thickness of the retainer 16.3 is smaller than the diameter of the guiding rollers 5.3; two parts of the guiding rollers 5.3 higher than the retainer 16.3 are respectively provided on the guiding support 5.2 and the impact guiding element 5.1; the guiding support 5.2 thereon is provided with a raceway 16.2 etc.; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1 and are provided in the retainer 16.3 and the raceway 16.2; the retainer 16.3 and the raceway 16.2 limit a rolling space and position of the guiding rollers 5.3; the guiding rollers 5.3 roll against the raceway 16.2; the guiding support 5.2, the impact guiding element 5.1 and the guiding rollers 5.3 in the retainer 16.3 and in the raceway 16.2 are matched closely to enable the impact guiding element 5.1 to reciprocate with rolling friction and control an impact direction of the impact guiding element 5.1;
the impact guiding element 5.1 thereon may be also provided with a raceway 16.2 etc.;
the remaining is the same as the embodiment 2.

Embodiment 26

[0221] As shown in Fig. 37, a wear-resistant impact mining machine, the guiding device 5 comprises a guiding support 5.2 and an impact guiding element 5.1 etc.; the impact drive device 4 comprises a crank impact drive device 4.2 etc.; the reciprocating impact part 3 further comprises a supporting box 13 etc.; the crank impact drive device 4.2 comprises a crank component and a power component etc.; the guiding device 5 is combined with the crank component of the crank impact drive device 4.2 in the supporting box 13; two ends of the impact guiding element 5.1 extending out of the supporting box 13 are provided with impact heads 6; an end of a power impact element 4.1 extending out of the supporting box 13 is connected or separated with the impact heads 6; a hydraulic impact drive device or a pneumatic impact drive device comprises a cylinder 4.4 etc.; the guiding support 5.2, the cylinder 4.4 and the supporting box 13 are separated or integrated; the supporting box 13 protects the power impact element 4.1 and the impact guiding element 5.1 etc. from being polluted and corroded by dust and waste water;
the impact drive device 4 may also apply a hydraulic impact drive device or a pneumatic impact drive device etc.;
one end of the impact guiding element may be also provided an impact head and the other end is provided with a counterweight element for preventing the impact head from damaging the guiding device 5, the impact drive device and/or the machine body etc. due to gravity unbalance, or only one end is provided with an impact head; the supporting box is simple, rational, delicate and compact in structure, small in volume and light in weight with less wear, perfect function and strong resistance to a damage force and an impact reactive force;
the remaining is the same as the embodiment 6.

Embodiment 27

[0222] As shown in Fig. 38, a wear-resistant impact mining machine, the guiding device 5 comprises a guiding support 5.2 and an impact guiding element 5.1 etc.; the impact drive device 4 comprises a hydraulic impact drive device or a pneumatic impact drive device etc.; the reciprocating impact part 3 further comprises a supporting box 13 etc.; the guiding device 5 is combined with the hydraulic impact drive device or the pneumatic impact drive device etc. in the supporting box 13; one end of the impact guiding element 5.1 extending out of the supporting box 13 is provided with an impact head 6 and the other end is provided with a counterweight element 7 for preventing the impact head 6 from damaging the guiding device 5, the impact drive device 4 and/or the machine body 1 etc.; due to gravity unbalance; an end of an power impact element 4.1 extending out of the supporting box 13 is connected or separated with the impact head 6; the hydraulic impact drive device or the pneumatic impact drive device comprises a cylinder 4.4 etc.; the guiding support 5.2, the cylinder 4.4 and the supporting box 13 are separated or integrated; the supporting box 13 protects the power impact element 4.1 and the impact guiding element 5.1 from being polluted by dust and waste water;
the impact drive device may also apply a crank impact drive device etc.;
impact head may be also provided at two ends or one end of the impact guiding element;
the remaining is the same as the embodiment 26.

Embodiment 28

[0223] As shown in Fig. 39, a wear-resistant impact mining machine, the power impact element 4.1 is connected, or separated or integrated with an impact head 6; one end of the power impact element 4.1 is provided with a damage-prevention mechanism 17 etc.; the damage-prevention mechanism 17 is provided as a rotating structure; the rotating structure of the damage-prevention mechanism 17 is provided as an arc-shaped catching groove type damage-prevention mechanism 17.1; the arc-shaped catching groove type damage-prevention mechanism 17.1 comprises an arc-shaped raised head 17.1.1 and a groove 17.1.2 etc. moveably locked with the arc-shaped raised head 17.1.1; the groove 17.1.2 is provided on the power impact element 4.1 or is integrated with the power impact element 4.1; the arc-shaped raised head 17.1.1 moveably locked with the groove 17.1.2 is provided on the impact head 6 or integrated with the im-

pact head 6; the rotating structure of the damage-prevention mechanism 17 is matched with the guiding device 5; the rotating structure is stressed to rotate to isolate an impact reactive damage force; the power impact element 4.1 drives the impact head 6 to impact; a reactive force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the guiding device 5;
at two ends of the power impact element 4.1 may be also provided with a damage-prevention mechanism 17;
the damage-prevention mechanism 17 may be also provided as a split structure etc.;
the rotating structure of the damage-prevention mechanism 17 may be also provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, or an arc-shaped catching groove type damage-prevention mechanism etc.;
the damage-prevention mechanism is provided between the power impact element and the impact head of the impact drive device; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates a reactive damage force in a split manner, thus reducing damage of an impact reactive force on the power impact element and preventing the impact drive device from being damaged;
the remaining is the same as the embodiment 2.

Embodiment 29

[0224] As shown in Fig. 40, a wear-resistant impact mining machine, two ends of the power impact element 4.1 are provided with a damage-prevention mechanism 17 etc.;
the remaining is the same as the embodiment 28.

Embodiment 30

[0225] As shown in Fig. 41 to Fig. 42, a wear-resistant impact mining machine, the power impact element 4.1 is connected or separated or integrated with an impact head 6; one end of the power impact element 4.1 is provided with a damage-prevention mechanism 17 etc.; the damage-prevention mechanism 17 is provided as a rotating structure; the rotating structure of the damage-prevention mechanism 17 is provided as a ball cage universal joint damage-prevention mechanism 17.2; the rotating structure of the damage-prevention mechanism 17 is matched with the guiding device 5; the rotating structure is stressed to rotate to isolate an impact reactive damage force; the power impact element 4.1 drives the impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the guiding device 5;
the remaining is the same as the embodiment 28.

Embodiment 31

[0226] As shown in Fig. 43, a wear-resistant impact mining machine, the power impact element 4.1 is connected or separated or integrated with an impact head 6; one end of the power impact element 4.1 is provided with a damage-prevention mechanism 17 etc.; the damage-prevention mechanism 17 is provided as a rotating structure; the rotating structure of the damage-prevention mechanism 17 is provided as a cross universal joint damage-prevention mechanism 17.3; the cross universal joint damage-prevention mechanism 17.3 comprises a cross shaft, and a cross universal joint fork etc.; the cross universal joint fork is connected by the cross shaft to realize a relative movement; the rotating structure of the damage-prevention mechanism 17 is matched with a guiding device 5; the rotating structure is stressed to rotate to isolate an impact reactive damage force; the power impact element 4.1 drives the impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the guiding device 5;
the remaining is the same as the embodiment 28.

Embodiment 32

[0227] As shown in Fig. 44, a wear-resistant impact mining machine, the power impact element 4.1 is connected or separated or integrated with an impact head 6; two ends of the power impact element 4.1 are provided with damage-prevention mechanisms 17 etc.; the damage-prevention mechanism 17 at one end is provided as a rotating structure and the damage-prevention mechanism 17 at the other end is provided as a split structure damage-prevention mechanism 17.4; the rotating structure of the damage-prevention mechanism 17 is provided as a cross universal joint; the rotating structure or the split structure of the damage-prevention mechanism 17 is matched with the guiding device 5; the rotating structure is stressed to rotate and the split structure isolates an impact reactive damage force; the power impact element 4.1 drives the impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the guiding device 5;
the remaining is the same as the embodiment 28.

Embodiment 33

[0228] As shown in Fig. 45, a wear-resistant impact mining machine, the jacking device 9 comprises a fixing support 9.5 and a buffering support 9.6 etc.; a buffering element 9.7 etc. is provided between the fixing support 9.5 and the buffering support 9.6; a buffering guiding element 9.8 etc. is provided on the fixing support 9.5 and the buffering support 9.6; a power impact element 4.1 drives an impact head 6 to impact; when an impact reactive force is applied on the buffering support 9.6 and the fixing support 9.5, the buffering element 9.7 is damaged to absorb the impact reactive force and the buffering guiding element 9.8 controls a buffering direction so that buffering is reciprocating straight line buffering, thus pre-

venting the impact head 6 from oscillating non-directionally during buffering;
the buffering structure applied by the device will not cause damage shearing to the machine body and the reciprocating impact part etc., thus reducing an impact to the travelling part and the machine body, greatly reducing various mining failures, prolonging the service life of the machine body and improving the working efficiency;
the buffering element has a rebounding force to increase the impact effect; when an impact reactive force is large, the buffering element can absorb and store impact energy and release the impact energy during the next impact period, thus further increasing an impact force to impact a material in a reciprocating manner;
the buffering guiding sleeve of the buffering device and the machine body are connected glidingly, thus increasing absorption of the buffering device on a reactive force generated by an impact on a coalbed or a rockbed;
the remaining is the same as the embodiment 2.

Embodiment 34

[0229] As shown in Fig. 46 to Fig. 47, a wear-resistant impact mining machine, the jacking device 9 or the reciprocating impact part 3 comprises a fixing support 9.5 and a buffering support 9.6 etc.; the jacking device 9 is provided with the fixing support 9.5 etc.; the reciprocating impact part 3 is correspondingly provided with the buffering support 9.6 etc.; a buffering element 9.7 etc. is provided between the fixing support 9.5 and the buffering support 9.6; a buffering guiding element 9.8 etc. is provided on the fixing support 9.5 and the buffering support 9.6; a power impact element 4.1 drives an impact head 6 to impact; when an impact reactive force is applied on the buffering support 9.6 and the fixing support 9.5 or is applied on the jacking device 9 and the frame 19 or is applied on the jacking device 9 and the reciprocating impact part 3, the buffering element 9.7 is damaged to absorb an impact reactive force and the buffering guiding element 9.8 controls a buffering direction so that buffering is reciprocating straight line buffering, thus preventing the impact head 6 from oscillating non-directionally during buffering;
an angle adjuster 18 is provided between the impact head 6 and a rocker arm lifting device 9 or between the impact head 6 and the machine body 1; the angle adjuster 18 adjusts an impact direction of the impact head 6;
the buffering structure applied by the device will not cause damage shearing to the machine body and the reciprocating impact part etc., thus reducing an impact to the travelling part and the machine body, greatly reducing various mining failures, prolonging the service life of the machine body and improving the working efficiency;
the remaining is the same as the embodiment 33.

Embodiment 35

[0230] As shown in Fig. 48, a wear-resistant impact mining machine, the jacking device 9 or the frame 19 comprises a fixing support 9.5 and a buffering support 9.6 etc.; the frame 19 is provided with the fixing support 9.5 etc.; the jacking device 9 is correspondingly provided with the buffering support 9.6 etc.; a buffering element 9.7 etc. is provided between the jacking device 9 and the frame 19; a buffering guiding element 9.8 etc. is provided on the jacking device 9 and the frame 19; a power impact element 4.1 drives an impact head 6 to impact; when an impact reactive force is applied on the buffering support 9.6 and the fixing support 9.5 or is applied on the jacking device 9 and the frame 19 or is applied on the jacking device 9 and the reciprocating impact part 3, the buffering element 9.7 is damaged to absorb an impact reactive force and the buffering guiding element 9.8 controls a buffering direction so that buffering is reciprocating straight line buffering, thus preventing the impact head 6 from oscillating non-directionally during buffering;
the buffering structure applied by the device will not cause damage shearing to the machine body and the reciprocating impact part etc., thus reducing an impact to the travelling part and the machine body, greatly reducing various mining failures, prolonging the service life of the machine body and improving the working efficiency;
the remaining is the same as the embodiment 33.

Embodiment 36

[0231] As shown in Fig. 49, a wear-resistant impact mining machine, the jacking device 9 or the reciprocating impact part 3 or the machine body 1 comprises a fixing support 9.5 and a buffering support 9.6 etc.; when the fixing support 9.5 is provided as a buffering guiding element 9.8, the buffering support 9.6 is provided as a buffering guiding sleeve; or when the buffering support 9.6 is provided as a buffering guiding element 9.8, the fixing support 9.5 is provided as a buffering guiding sleeve; when the buffering guiding element 9.8 thereon is provided with a guiding lug boss 9.9 or a guiding groove, the buffering guiding sleeve thereon is provided with a guiding groove or a guiding lug boss 9.9 locked with the guiding lug boss 9.9 or the guiding groove; two sides of a convex part of the guiding lug boss 9.9 are both provided with a buffering element 9.7; the buffering guiding element 9.8 supports the buffering guiding sleeve to slide in a reciprocating manner in a straight line along the buffering guiding element 9.8 or the buffering guiding sleeve supports the buffering guiding element 9.8 to slide in a reciprocating manner in a straight line along the buffering guiding sleeve; the buffering guiding element 9.8, the buffering element 9.7 and the buffering guiding sleeve etc. form a bi-directional structure guiding buffering device; a power impact element 4.1 drives an impact head 6 to impact; an impact reactive damage force is applied on the bi-directional structure guiding buffering device; the bi-directional structure guiding buffering device absorbs the impact reactive force; two ends of an impact guiding element 5.1 are provided with impact heads 6 or

one end is provided with an impact head 6 and the other end is provided with a counterweight element 7 for preventing the impact head 6 from damaging a guiding device 5, an impact drive device 4, the jacking device 9 and./or the machine body 1 etc. due to gravity unbalance or one end is provided with an impact head 6; the power impact element 4.1 drives the impact head 6 to reciprocate; the buffering elements 9.7 at the front part of the guiding lug boss 9.9 and the back part of the guiding lug boss 9.9 absorb an impact reactive force of the impact head 6; the buffering guiding element 9.8, the buffering guiding sleeve and the buffering elements 9.7 are matched with each other to absorb an impact reactive force of the impact head 6 and control a blubbering direction to be reciprocating straight line buffering; the buffering guiding sleeve slides oppositely in a straight line against the buffering guiding element 9.8, thus preventing the jacking device 9, the impact drive device 4 and the guiding device 5 from oscillating non-directionally and stabilizing an impact direction of the impact head 6;
the buffering guiding element, the buffering element and the buffering guiding sleeve of the device are matched with each other to form a bi-directional guiding structure buffering device; the jacking device is provided on the bi-directional guiding structure buffering device; the bi-directional guiding structure buffering device improves the buffering effect and effectively protects the device;
the remaining is the same as the embodiment 2.

Embodiment 37

[0232] As shown in Fig. 50, a wear-resistant impact mining machine, the jacking device 9 or the machine body 1 comprises a fixing support 9.5 and a buffering support 9.6 etc.; the machine body 1 is provided with the fixing support 9.5 etc.; the jacking device 9 is correspondingly provided with the buffering support 9.6 etc.; the buffering support 9.6 is provided as a buffering guiding element 9.8; the buffering support 9.5 is a buffering guiding sleeve; when the buffering guiding element 9.8 thereon is provided with a guiding lug boss 9.9 or a guiding groove, the buffering guiding sleeve thereon is provided with a guiding groove or a guiding lug boss 9.9 locked with the guiding lug boss 9.9 or the guiding groove; two sides of a convex part of the guiding lug boss 9.9 are both provided with a buffering element 9.7; the buffering guiding element 9.8 supports the buffering guiding sleeve to slide in a reciprocating manner in a straight line along the buffering guiding element 9.8 or the buffering guiding sleeve supports the buffering guiding element 9.8 to slide in a reciprocating manner in a straight line along the buffering guiding sleeve; the buffering guiding element 9.8, the buffering element 9.7 and the buffering guiding sleeve etc. form a bi-directional structure guiding buffering device; a power impact element 4.1 drives an impact head 6 to impact; an impact reactive damage force is applied on the bi-directional structure guiding buffering device; the bi-directional structure guiding buffering device absorbs the impact reactive force; two ends of an impact guiding element 5.1 are provided with impact heads 6 or one end is provided with an impact head 6 and the other end is provided with a counterweight element 7 for preventing the impact head 6 from damaging a guiding device 5, an impact drive device 4, the jacking device 9 and./or the machine body 1 etc. due to gravity unbalance; the power impact element 4.1 drives the impact head 6 to reciprocate; the buffering elements 9.7 at the front part of the guiding lug boss 9.9 and the back part of the guiding lug boss 9.9 absorb an impact reactive force of the impact head 6; the buffering guiding element 9.8, the buffering guiding sleeve and the buffering elements 9.7 are matched with each other to absorb an impact reactive force of the impact head 6 and control a blubbering direction to be reciprocating straight line buffering; the buffering guiding sleeve slides oppositely in a straight line against the buffering guiding element 9.8, thus preventing the jacking device 9, the impact drive device 4 and the guiding device 5 etc. from oscillating non-directionally and stabilizing an impact direction of the impact head 6; the fixing support 9.5 and the buffering support 9.6 comprise a retaining structure etc. or the buffering guiding element 9.8 and the buffering guiding sleeve comprise a retaining structure etc.; the retaining structure comprises a retaining element 9.10 etc.; the retaining element 9.10 prevents the fixing support 9.5 and the buffering support 9.6 from being detached during opposite reciprocating sliding or the retaining element 9.10 prevents the buffering guiding element 9.8 or the buffering guiding sleeve from being detached during opposite reciprocating sliding; the retaining element 9.10 and the fixing support 9.5 are separated or integrated; or the retaining element 9.10 and the buffering support 9.6 are separated or integrated; or the retaining element 9.10 and the buffering guiding element 9.8 are separated or integrated; or the retaining element 9.10 and the buffering guiding sleeve are separated or integrated;
the remaining is the same as the embodiment 36.

Embodiment 38

[0233] As shown in Fig. 51 to Fig. 52, a wear-resistant impact mining machine, the jacking device 9 comprises a rotation power source element 9.11 and a rotation impact transmission element 9.12 etc.; the rotation power source element 9.11 applies an electric machine; the jacking device 9 comprises a fixing support 9.5 and a buffering support 9.6 etc.; a buffering device etc. is provided between the fixing support 9.5 and the buffering support 9.6; the buffering device comprises a rotation power buffering device and a structure guiding buffering device etc.;
the rotation power buffering device is provided between the rotation power source element 9.11 and the rotation impact transmission element 9.12 or is provided in the rotation impact transmission element 9.12; the rotation power buffering device comprises a sliding stroke spline

shaft housing buffering mechanism 20 or a belt buffering mechanism 21 etc.; the sliding stroke spline shaft housing buffering mechanism 20 comprises a spline shaft 20.1 and a spline housing 20.2 etc.; a sliding reciprocating stroke section is provided between the spline shaft 20.1 and the spline housing 20.2; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force;
the belt buffering mechanism 21 comprises a driving pulley 21.1, a driven pulley 21.2 and a belt 21.3 etc.; the driving pulley 21.1 is fixed on the fixing support 9.5; the driving pulley 21.1 is connected with a drive shaft of the electric machine; the driven pulley 21.2 is provided on the buffering support 9.6; the belt 21.3 is provided on the driving pulley 21.1 and the driven pulley 21.2; a tensioner 21.4 etc. is provided between the driving pulley 21.1 and the driven pulley 21.2; the driven pulley 21.2 moves as the buffering support 9.6 is impacted; the belt 21.3 absorbs an impact reactive force; the belt buffering mechanism 21 prevents the electric machine from being damaged;
the tensioner is provided at an inner side or an outer side of the belt 21.3; the tensioner comprises a tensioning wheel, a tensioning wheel bracket, a tensioning spring, a tensioning adjusting rod, and a tensioning base etc.; the tensioning wheel is provided on the tensioning wheel bracket; a guiding hole etc. is provided on the tensioning wheel bracket; one end of the tensioning adjusting rod is a polished rod and the other end is a screw rod and the middle is provided with a shoulder; the tensioning wheel bracket is matched with the polished rod end of the tensioning adjusting rod through the guiding hole; the screw rod end of the tensioning adjusting rod is in threaded connection with the tensioning base; the tensioning spring is provided between the tensioning wheel bracket and the shoulder; the tensioning wheel tightly presses the belt 21.3 with an elastic force of the spring; a tensioning force is adjusted with a screwing length of the screw rod and the tensioning base;
the structure guiding buffering device comprises a buffering element 9.7 and a buffering guiding element 9.8 etc.; the buffering element 9.7 is provided between the fixing support 9.5 and the buffering support 9.6; the buffering guiding element 9.8 is provided on the fixing support 9.5 and the buffering support 9.6; the structure guiding buffering device absorbs an impact reactive force through the buffering element 9.7 while controlling a buffering direction through the buffering guiding element 9.8; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering mechanism and the belt buffering mechanism etc. to absorb and buffer an impact reactive force of a reciprocating impact part and control a buffering direction, thus preventing the rotation power source element or the jacking device or the frame etc. from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.
during a power transmission process, the spline shaft and the spline housing of the sliding stroke spline shaft housing buffering device are matched with each other to transmit power and slide in a reciprocating manner to buffer, thus an impact is only caused by a torque instead of being caused by an axial force, a good vibration isolation effect is realized, a dynamic sliding resistance is small during a mining process and the impact head is protected effectively; during an impact falling and impact vibration transmission process of the reciprocating impact part, the device decomposes an impact reactive force through reciprocating sliding buffering, thus protecting the power source element from being damaged, and greatly improving the service life and running reliability of the power source element;
the rotation power source element may also apply a hydraulic motor or a pneumatic motor etc.;
the remaining is the same as the embodiment 2.

Embodiment 39

[0234] As shown in Fig. 53, a wear-resistant impact mining machine, the frame 19 comprises a rotation power source element 9.11 etc.; the jacking device 9 comprises a rotation impact transmission element 9.12 etc.; the rotation power source element 9.11 applies a hydraulic motor; the frame 19 is provided with a fixing support 9.5 etc.; the jacking device 9 is correspondingly provided with a buffering support 9.6 etc.; a buffering device etc. is provided between the frame 19 and the jacking device 9; the buffering device comprises a rotation power buffering device and a structure guiding buffering device etc.;
the structure guiding buffering device comprises a buffering element 9.7 and a buffering guiding element 9.8 etc.; the buffering element 9.7 is provided between the frame 19 and the jacking device 9; the buffering guiding element 9.8 is provided on the frame 19 and the jacking device 9; the structure guiding buffering device absorbs an impact reactive force through the buffering element 9.7 while controlling a buffering direction through the buffering guiding element 9.8; the structure guiding buffering device is matched with a sliding stroke spline shaft housing buffering mechanism 20 and a belt buffering mechanism 21 etc. to absorb and buffer an impact reactive force of a reciprocating impact part 3 and control a buffering direction, thus preventing the rotation power source element 9.11 or the jacking device 9 or the frame 19 etc. from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head 6 faces an object to be mined;
the remaining is the same as the embodiment 38.

Embodiment 40

[0235] As shown in Fig. 54 to Fig. 55, a wear-resistant impact mining machine, the buffering device comprises a rotation power buffering device or a structure guiding buffering device etc.;
the rotation power buffering device is provided between

a rotation power source element 9.11 and a rotation impact transmission element 9.12 or is provided in the rotation impact transmission element 9.12; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering mechanism 20 etc.; the sliding stroke spline shaft housing buffering mechanism 20 comprises a spline shaft 20.1 and a spline housing 20.2 etc.; a sliding reciprocating stroke section is provided between the spline shaft 20.1 and the spline housing 20.2; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force;
the structure guiding buffering device comprises a buffering element 9.7 and a buffering guiding element 9.8 etc.; the buffering element 9.7 is provided between a fixing support 9.5 and a buffering support 9.6; the buffering guiding element 9.8 is provided on the fixing support 9.5 and the buffering support 9.6; the buffering guiding element 9.8 is connected by a bolt in a split manner; the structure guiding buffering device absorbs an impact reactive force through the buffering element 9.7 while controlling a buffering direction through the buffering guiding element 9.8; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering mechanism 20 and a belt buffering mechanism 21 etc. to absorb and buffer an impact reactive force of the reciprocating part 3 and guide a buffering direction, thus preventing the rotation power source element 9.11 or the jacking device 9 or the frame 19 etc. from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head 6 faces an object to be mined;
the remaining is the same as the embodiment 38.

Embodiment 41

[0236] As shown in Fig. 56, a wear-resistant impact mining machine, the buffering guiding element 9.8 is connected by a clamping groove in a split manner, and the remaining is the same as the embodiment 40.

Embodiment 42

[0237] As shown in Fig. 57, a wear-resistant impact mining machine, the jacking device 9 comprises a rotation power source element 9.11, and a rotation impact transmission element 9.12 etc.; the rotation power source element 9.11 comprises a pneumatic motor etc.; the jacking device 9 comprises a fixing support 9.5 and a buffering support 9.6 etc.; a buffering device etc. is provided between the fixing support 9.5 and the buffering support 9.6; the buffering device comprises a rotation power buffering device or a structure guiding buffering device etc.; the rotation power buffering device is provided between the rotation power source element 9.11 and the rotation impact transmission element 9.12 or is provided in the rotation impact transmission element 9.12; the rotation power buffering device comprises a belt buffering mechanism 21 etc.; the belt buffering mechanism 21 comprises a driving pulley 21.1, a driven pulley 21.2 and a belt 21.3 etc.; the driving pulley 21.1 is fixed on the fixing support 9.5; the driving pulley 21.1 is connected with a drive shaft of the pneumatic motor; the driven pulley 21.2 is provided on the buffering support 9.6; the belt 21.3 is provided on the driving pulley 21.1 and the driven pulley 21.2; the driven pulley 21.2 moves as the buffering support 9.6 is impacted; the belt 21.3 absorbs an impact reactive force; the belt buffering mechanism 21 prevents the pneumatic motor from being damaged;
the structure guiding buffering device comprises a buffering element 9.7 and a buffering guiding element 9.8 etc.; the buffering element 9.7 is provided between the fixing support 9.5 and the buffering support 9.6; the buffering guiding element 9.8 is provided on the fixing support 9.5 and the buffering support 9.6; the structure guiding buffering device absorbs an impact reactive force through the buffering element 9.7 while controlling a buffering direction through the buffering guiding element 9.8; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering mechanism 20 or the belt buffering mechanism 21 etc. to absorb and buffer an impact reactive force of a reciprocating impact part 3 and control a buffering direction, thus preventing the rotation power source element 9.11 or the jacking device 9 or the frame 19 etc. from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head 6 faces an object to be mined;
the remaining is the same as the embodiment 38.

Embodiment 43

[0238] As shown in Fig. 58, a wear-resistant impact mining machine, the jacking device 9 comprises a rotation power source element 9.11, and a rotation impact transmission element 9.12 etc.; the rotation power source element 9.11 comprises a pneumatic motor etc.; the jacking device 9 comprises a fixing support 9.5 and a buffering support 9.6 etc.; a buffering device etc. is provided between the fixing support 9.5 and the buffering support 9.6; the buffering device comprises a rotation power buffering device or a structure guiding buffering device etc.; the rotation power buffering device is provided between the rotation power source element 9.11 and the rotation impact transmission element 9.12 or is provided in the rotation impact transmission element 9.12; the rotation power buffering device comprises a belt buffering mechanism 21 etc.; the belt buffering mechanism 21 comprises a driving pulley 21.1, a driven pulley 21.2 and a belt 21.3 etc.; the driving pulley 21.1 is fixed on the fixing support 9.5; the driving pulley 21.1 is connected with a drive shaft of the pneumatic motor; the driven pulley 21.2 is provided on the buffering support 9.6; the belt 21.3 is provided on the driving pulley 21.1 and the driven pulley 21.2; a belt tensioning device 21.4 applies a driving pulley 21. 1 tensioning mode; the driven pulley 21.2 moves as

the buffering support 9.6 is impacted; the belt 21.3 absorbs an impact reactive force; the belt buffering mechanism 21 prevents the pneumatic motor from being damaged;
the belt buffering mechanism 21 comprises a tensioner etc.; the tensionor comprises a sliding base and a tensioning spring etc.; the driving pulley 21. 1 and an electric machine or a hydraulic motor or the pneumatic motor etc. are installed on the sliding base; the sliding base is matched glidingly with a rocker arm 9.1 fixing element; one end of the tensioning spring is connected with the sliding base and the other end is connected with the rocker arm 9.1 fixing element; the spring applies a certain acting force on the sliding base to tension the belt 21.3; the structure guiding buffering device comprises a buffering element 9.7 and a buffering guiding element 9.8 etc.; the buffering element 9.7 is provided between the fixing support 9.5 and the buffering support 9.6; the buffering guiding element 9.8 is provided on the fixing support 9.5 and the buffering support 9.6; the structure guiding buffering device absorbs an impact reactive force through the buffering element 9.7 while controlling a buffering direction through the buffering guiding element 9.8; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering mechanism 20 or the belt buffering mechanism 21 etc. to absorb and buffer an impact reactive force of a reciprocating impact part 3 and control a buffering direction, thus preventing the rotation power source element 9.11 or the jacking device 9 or the frame 19 etc. from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head 6 faces an object to be mined;
the remaining is the same as the embodiment 42.

Embodiment 44

[0239] As shown in Fig. 59 and Fig. 60, a wear-resistant impact mining machine, the impact drive device 4 comprises a crank impact drive device 4.2 etc.; a jacking device 9 comprises a rocker arm 9.1 etc.; the rocker arm 9.1 is a parallelogram rocker arm 9.1; the parallelogram rocker arm 9.1 comprises a main rocker arm 9.1.1 and a secondary rocker arm 9.1.2 etc.; a reciprocating impact part 3 comprises a supporting box 13 or a supporting frame 8 etc.; one end of the main rocker arm 9.1.1 is hinged with a machine body 1 and the other end is hinged with the supporting box 13 or the supporting frame 8; one end of the secondary rocker arm 9.1.2 is hinged with the machine body 1 and the other end is hinged with the supporting box 13 or the supporting frame 8; the main rocker arm 9.1.1 and/or the secondary rocker arm 9.1.2 support/supports the reciprocating impact part 3; the main rocker arm 9.1.1 and the secondary rocker arm 9.1.2 are matched with each other to adjust a mining direction or position of an impact head 6, thus ensuring that the next impact of the impact head 6 is applied to an object to be mined; the travelling part 2 drives the machine body 1 to travel to implement reciprocating impact and continuous mining;
the impact drive device 4 comprises a hydraulic impact drive device or a pneumatic impact drive device etc.;
the remaining is the same as the embodiment 2.

Embodiment 45

[0240] As shown in Fig. 61 to Fig. 62, a wear-resistant impact mining machine, the impact drive device 4 comprises a hydraulic impact drive device or a pneumatic impact drive device etc.; a jacking device 9 comprises a rocker arm 9.1 etc.; the rocker arm 9.1 is a single rocker arm 9.1; a reciprocating impact part 3 comprises a supporting box 13 and a supporting frame 8 etc.; one end of the rocker arm 9.1 is hinged with a machine body 1 and the other end is connected with the supporting box 13 or the supporting frame 8; one end of a lifting oil cylinder is hinged with the machine body 1 and the other end is hinged with the rocker arm 9.1; driven by a driving oil cylinder, the rocker arm 9.1 oscillates up and down to adjust a mining direction or position of an impact head 6, thus ensuring that the next impact of the impact head 6 is applied to an object to be mined; the travelling part 2 drives the machine body 1 to travel to implement reciprocating impact and continuous mining;
the remaining is the same as the embodiment 2.

Embodiment 46

[0241] As shown in Fig. 63, a wear-resistant impact mining machine, the reciprocating impact 3 comprises a supporting box 13 or a supporting frame 8 etc.; an impact drive device 4 comprises a crank impact drive device 4.2 etc.; the crank impact drive device 4.2 comprises a multi-throw crank multi-rod impact mechanism 22 and a power output component etc.; the a multi-throw crank multi-rod impact mechanism 22 comprises a multi-throw crank 22.1, and a connecting rod 22.2 etc.; the multi-throw crank comprises a power concentric shaft section 22.1.1, connecting handles 22.1.2 and eccentric shafts 22.1.3 etc.; the power concentric shaft section 22.1.1, the connecting handles 22.1.2 and the eccentric shafts 22.1.3 are separated, or integrated; one end of the power concentric shaft section 22.1.1 of the multi-throw crank 22.1 is connected with the power output component of the crank impact drive device 4.2; the other end of the power concentric shaft section 22.1.1 is provided with two or more connecting handles 22.1.2 and eccentric shafts 22.1.3; the power concentric shaft section 22.1.1 of the multi-throw crank 22.1 is installed on the supporting box 13 or the supporting frame 8; an eccentric shaft 22.1.3 of the multi-throw crank 22.1 is connected with one end of the connecting rod 22.2 and the other end of the connecting rod 22.2 is connected or separated with the impact head 6; one eccentric shaft 22.1.3 drives one or more connecting rods 22.2 to impact in a reciprocating manner; the guiding device 5 comprises a guiding device

5 etc.;
the multi-throw crank is manufactured with a simple integral structure with sufficient rigidity and high strength to transmit a large rotation torque; the multi-throw crank is rational in structure and manufactured with a small volume to greatly lighten the reciprocating impact part and improve the adjusting flexibility of the reciprocating impact part;
the multi-throw crank is composed of multiple eccentric shafts; each eccentric shaft drives one power impact element; the other end of the power impact element is provided with one or more impact heads, thus greatly improving mining efficiency;
the eccentric shafts of the multi-throw crank are arranged symmetrically along a radial direction of the power concentric shaft section to form angle difference; power impact elements driven by the eccentric shafts can impact a coalbed or a rockbed in different periods of time; a reactive force generated during an impact of a power impact element can be converted into the power of the next power impact element at the same side; at the same time, a reactive force generated by one impact on a thick coalbed or rockbed is decomposed so that the impact drive device is stressed uniformly to buffer and stabilize the machine body.

Embodiment 47

[0242] As shown in Fig. 64, a wear-resistant impact mining machine, the impact head 6 comprises impact external layer material teeth 6.1, and impact internal layer material teeth 6.2; the impact internal layer material teeth 6.2 are shaped or arranged so as to fall an internal layer material of a coal wall or a rock wall to be mined; the impact external layer material teeth 6.1 are shaped and arranged so that a material fallen by the impact internal layer material teeth 6.2 can flow out from gaps between the impact external layer material teeth 6.1; the impact external layer material teeth 6.1 and impact internal layer material teeth 6.2 are arranged in parallel to form a multi-layer impact head 6; the mining width and mining efficiency are improved by the multi-layer impact head 6;
a multi-layer impact mechanism is apply to mining an objected to be mined layer by layer, thus reducing an impact resistance caused by impacting a thick object to be mined not layer by layer, reducing damage caused by a generated large impact reactive force on the reciprocating impact part and the machine body, reducing energy consumption during a power transmission process and improving working efficiency;
the impact teeth of the impact head are multiple rows of impact teeth to impact a coalbed or a rockbed into steps while decomposing a fallen coal block or rock block to form grains applicable to transportation of a conveyor in one step, thus avoiding the problem of transportation difficulty due to oversize lumps during a mining process;
the remaining is the same as the embodiment 2.

Embodiment 48

[0243] As shown in Fig. 65, a wear-resistant impact mining machine, the impact head 6 comprises a step tooth impact cutting mechanism 6.3; the step tooth impact cutting mechanism 6.3 comprises impact teeth 6.3.1; the impact teeth 6.3.1 are multi-layer impact teeth 6.3.1; tooth heads are provided on the impact teeth 6.3.1; the tooth heads and the impact teeth 6.3.1 are connected in a separated manner or integrated; the distances between tooth heads of two adjacent layers of impact teeth 6.3.1 are different; a coal wall or a rock wall to be mined is impacted into steps; two or more opposite free surfaces are formed on each step of the step-shaped coal wall or rock wall; the pressure stress and structural strength of the step-shaped coal wall or rock wall are greatly reduced compared with the original planar coal wall or rock wall; after the coal wall or the rock wall is impacted into steps, a material is fallen by reasonably using the two opposite free surfaces of the step-shaped coal wall or rock wall when impact teeth 6.3.1 of each layer perform mining again, thus greatly reducing impact resistance, avoiding oversize lumps of the material fallen by the impact head 6, reducing power consumption and improving impact efficiency;
the tooth heads may be also arranged into are arranged into spherical impact heads 6, or conical impact heads 6, or hemispherical impact heads 6, or shovelshaped impact heads 6, or trapezoidal impact heads 6, or triangular impact heads 6;
the impact teeth 6.3.1 comprise top surface cleaning teeth, bottom surface cleaning teeth or side cleaning teeth etc.; the top surface cleaning teeth, the bottom surface cleaning teeth and the side cleaning teeth are provided on the same impact tooth frame.
the step tooth impact cutting mechanism can make a coalbed or a rockbed into steps; the pressure stress and structural strength of the step-shaped coalbed or rockbed are greatly reduced compared with the original planar coalbed or rockbed; two opposite free surfaces of the step-shaped coalbed or rockbed are reasonably applied to impacting and falling a material when the impact teeth of each layer perform mining again, thus reducing an impact resistance, avoiding lumps of the material fallen by the impact head 6, improving working efficiency and reducing power consumption;
the remaining is the same as the embodiment 2.

Embodiment 49

[0244] As shown in Fig. 66, a wear-resistant impact mining machine, the impact head 6 comprises an impact external layer material tooth frame 6.4 and impact external layer material teeth 6.1; the impact external layer material tooth frame 6.4 is provided with a discharge hole 6.8; the impact external layer material teeth 6.1 are provided on the impact external layer material tooth frame 6.4 and face a to-be-mined surface; the impact head 6

further comprises an impact internal layer material tooth frame 6.6 and impact internal layer material teeth 6.2; the impact internal layer material teeth 6.2 and the impact internal layer material tooth frame 6.6 are connected in a separated manner or integrated; the impact external layer material teeth 6.1 are shaped or arranged to fall an external layer material of a layer to be mined; the discharge hole 6.8 enables the material fallen by the impact internal layer material teeth 6.2 to flow out; multiple layers of impact mechanisms are matched with each other to fall and discharge a material simultaneously;
the remaining is the same as the embodiment 2.

Embodiment 50

[0245] As shown in Fig. 67, a wear-resistant impact mining machine, the impact head 6 comprises an impact external layer material tooth frame 6.4, impact external layer material teeth 6.1, an impact internal layer material tooth frame 6.6 and impact internal layer material teeth 6.2; the impact external layer material tooth frame 6.4 and the impact internal layer material tooth frame 6.6 comprise a back support 6.9.1 and an impact tooth support 86.9.2 etc.; the back support 6.9.1 and the impact tooth support 86.9.2 form a discharge hole 6.8; the impact external layer material teeth 6.1 are provided on the impact external layer material tooth frame 6.4 and face a surface to be mined; the impact head 6 further comprises the impact internal layer material teeth 6.2 connected in a separated manner or integrated with the impact internal layer material tooth frame 6.6; the impact external layer material teeth 6.1 are shaped or arranged to fall an external layer material of a layer to be mined; the discharge hole 6.8 enables the material fallen by the impact internal layer material teeth 6.2 to flow out; multiple layers of impact mechanisms are matched with each other to fall and discharge a material simultaneously;
the remaining is the same as the embodiment 49.

Embodiment 51

[0246] As shown in Fig. 68 to Fig. 70, a wear-resistant impact mining machine, the jacking device 9 comprises a vertical lifting mechanism 23 etc.; the vertical lifting mechanism 23 drives an reciprocating impact part 3 to move up and down; the vertical lifting mechanism 23 comprises a lifting platform 23.1, a lifting platform support 23.2 and a vertical lifting driver 23.3 etc.; the vertical lifting driver 23.3 applies a rope and roper coiler; the vertical lifting driver 23.3 drives the lifting platform 23.1 to ascend and descend vertically; the vertical lifting mechanism 23 further comprises a locating locker 23.4 etc.; the locating locker 23.4 comprises a lock tongue; the locating locker 23.4 locates and locks the lifting platform 23.1;
the vertical lifting driver 23.3 may further apply a gear and rack, a screw pole, a shaft coupling, a chain wheel and chain, a hydraulic element or a pneumatic element etc.;
the locating locker 23.4 may further apply a bolt, a cushion block, a pull rope, a hydraulic cylinder, or a pneumatic cylinder etc.;
the jacking device 9 comprises a translation device 24 etc.; the translation device 24 is provided at a front part of a machine body 1; the translation device 24 enables translation of the reciprocating impact part 3 relative to the machine body 1;
the vertical lifting mechanism can ensure that the reciprocating impact part impacts vertically, reduce the lengths of the jacking part and the machine body etc., reduce energy consumption and facilitate maintenance; a lifting track is linear, thus increasing lifting stability and improving the service life of a lifting support;
the remaining is the same as the embodiment 2.

Embodiment 52

[0247] As shown in Fig. 71, a wear-resistant impact mining machine, the jacking device 9 comprises a vertical lifting mechanism 23 etc.; the vertical lifting mechanism 23 drives an reciprocating impact part 3 to move up and down; the vertical lifting mechanism 23 comprises a lifting platform 23.1, a lifting platform support 23.2 and a vertical lifting driver 23.3 etc.; the vertical lifting driver 23.3 applies a hydraulic element; the vertical lifting driver 23.3 drives the lifting platform 23.1 to ascend and descend vertically; the vertical lifting mechanism 23 further comprises a locating locker 23.4 etc.; the locating locker 23.4 applies a lock tongue; the locating locker 23.4 locates and locks the lifting platform 23.1;
the remaining the same as the embodiment 51.

Embodiment 53

[0248] As shown in Fig. 72, a wear-resistant impact mining machine, the jacking device 9 comprises a vertical lifting mechanism 23 etc.; the vertical lifting mechanism 23 drives an reciprocating impact part 3 to move up and down; the vertical lifting mechanism 23 comprises a lifting platform 23.1, a lifting platform support 23.2 and a vertical lifting driver 23.3 etc.; the vertical lifting driver 23.3 applies a spiral rod; the vertical lifting driver 23.3 drives the lifting platform 23.1 to ascend and descend vertically; the vertical lifting mechanism 23 further comprises a locating locker 23.4 etc.; the locating locker 23.4 applies a lock tongue; the locating locker 23.4 locates and locks the lifting platform 23.1;
the remaining the same as the embodiment 51.

Embodiment 54

[0249] As shown in Fig. 73 to Fig. 74, a wear-resistant impact mining machine, the impact drive device 4 comprises a rolling guiding hydraulic drive device or a rolling guiding pneumatic drive device etc.; the rolling guiding hydraulic drive device or the rolling guiding pneumatic drive device comprises guiding rollers 5.3, a guiding sup-

port 5.2, a power impact element 4.1, a piston 4.5, a cylinder 4.4, and a control element 4.6 etc.; the piston 4.5 is provided in the cylinder 4.4; the guiding rollers 5.3 are provided between the guiding support 5.2 and the power impact element 4.1; the guiding rollers 5.3, the guiding support 5.2 and the power impact element 4.1 are matched closely so that the guiding rollers 5.3 support through rolling friction the power impact element 4.1 to reciprocate and control an impact direction of the power impact element 4.1; the guiding support 5.2 and the cylinder 4.4 are integrated; the control element 4.6 controls flowing of a liquid or a gas; the piston 4.5 is pushed by the pressure of the liquid or the gas to reciprocate; one end of the power impact element 4.1 is separated with the piston 4.5; the piston 4.5 drives the power impact element 4.1 to drive an impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the rolling guiding hydraulic drive device or the rolling guiding pneumatic drive device;
one end of the power impact element 4.1 and the piston 4.5 may be also connected or integrated etc.;
the cylinder 4.4 applies a circular cylinder, and may also apply a square cylinder, a trapezoidal cylinder, an irregular cylinder or a polygonal cylinder etc.;
the remaining is the same as the embodiment 2.

Embodiment 55

[0250] As shown in Fig. 75 to Fig. 76, a wear-resistant impact mining machine, the impact drive device 4 comprises a rolling guiding hydraulic drive device or a rolling guiding pneumatic drive device; the rolling guiding hydraulic drive device or the rolling guiding pneumatic drive device comprises guiding rollers 5.3, a guiding support 5.2, a power impact element 4.1, a piston 4.5, a cylinder 4.4, and a control element 4.6 etc.; the piston 4.5 is provided in the cylinder 4.4; the guiding rollers 5.3 are provided between the guiding support 5.2 and the power impact element 4.1; the guiding rollers 5.3, the guiding support 5.2 and the power impact element 4.1 are matched closely so that the guiding rollers 5.3 support through rolling friction the power impact element 4.1 to reciprocate and control an impact direction of the power impact element 4.1; the guiding support 5.2 and the cylinder 4.4 are integrated; the control element 4.6 controls flowing of a liquid or a gas; the piston 4.5 is pushed by the pressure of the liquid or the gas to reciprocate; one end of the power impact element 4.1 is connected with the piston 4.5; the piston 4.5 drives the power impact element 4.1 to drive an impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the rolling guiding hydraulic drive device or the rolling guiding pneumatic drive device;
the cylinder 4.4 applies a polygonal cylinder, and may also apply a square cylinder, a trapezoidal cylinder, an irregular cylinder or a circular cylinder etc.;
the remaining is the same as the embodiment 54.

Embodiment 56

[0251] As shown in Fig. 77 to Fig. 78, a wear-resistant impact mining machine, the impact drive device 4 comprises a rolling guiding hydraulic drive device or a rolling guiding pneumatic drive device etc.; the rolling guiding hydraulic drive device or the rolling guiding pneumatic drive device comprises guiding rollers 5.3, a guiding support 5.2, a power impact element 4.1, a piston 4.5, a cylinder 4.4, a control element 4.6 and an airbag 4.7 etc.; the piston 4.5 is provided in the cylinder 4.4; the airbag 4.7 etc. is provided between the piston 4.5 and the cylinder 4.4; the piston 4.5 moves backwards to press the airbag 4.7; the pressure in the airbag 4.7 increases to apply an acting force to the piston 4.5 moving reversely to accelerate a movement of the piston 4.5;
the guiding rollers 5.3 are provided between the guiding support 5.2 and the power impact element 4.1; the guiding rollers 5.3, the guiding support 5.2 and the power impact element 4.1 are matched closely so that the guiding rollers 5.3 support through rolling friction the power impact element 4.1 to reciprocate and control an impact direction of the power impact element 4.1; the guiding support 5.2 and the cylinder 4.4 are separated;
the control element 4.6 controls flowing of a liquid or a gas; the piston 4.5 is pushed by the pressure of the liquid or the gas to reciprocate; one end of the power impact element 4.1 is connected with the piston 4.5; the piston 4.5 drives the power impact element 4.1 to drive an impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the rolling guiding hydraulic drive device or the rolling guiding pneumatic drive device;
the cylinder 4.4 applies an irregular cylinder, and may also apply a square cylinder, a trapezoidal cylinder, an polygonal cylinder or a circular cylinder etc.;
the remaining is the same as the embodiment 54.

Embodiment 57

[0252] As shown in Fig. 79, a wear-resistant impact mining machine, the impact drive device 4 comprises a rolling guiding rolling piston hydraulic drive device or a rolling guiding rolling piston pneumatic drive device etc.; the rolling guiding rolling piston hydraulic drive device or the rolling guiding rolling piston pneumatic drive device comprises a cylinder 4.4, a piston 4.5, power rollers 4.8, guiding rollers 5.3, a guiding support 5.2, a control element 4.6 and a power impact element 4.1 etc.; the power rollers 4.8 are provided in the piston 4.5 to form a rolling piston 4.5; the rolling piston 4.5 is provided in the cylinder 4.4; the rolling piston 4.5 and the cylinder 4.4 are supported by the power rollers 4.8 to have rolling friction; the guiding rollers 5.3 are provided between the guiding support 5.2 and the power impact element 4.1; the guiding rollers 5.3, the guiding support 5.2 and the power impact

element 4.1 are matched closely so that the guiding rollers 5.3 support through rolling friction the power impact element 4.1 to reciprocate and control an impact direction of the power impact element 4.1; the guiding support 5.2 and the cylinder 4.4 are integrated; the control element 4.6 controls flowing of a liquid or a gas; the rolling piston 4.5 is pushed by the pressure of the liquid or the gas to reciprocate; the piston 4.5 drives the power impact element 4.1 to drive an impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the rolling guiding rolling piston hydraulic drive device or the rolling guiding rolling piston pneumatic drive device;
one end of the power impact element 4.1 and the rolling piston 4.5 may be separated and may be also connected or integrated etc.; the other end of the power impact element 4.1 and the impact head 6 are integrated, and may be also separated or connected etc.;
sealing elements 14 etc. are provided on the piston 4.5; the sealing elements 14 are provided at two ends of the piston 4.5; the power rollers 4.8 are provided between the sealing elements 14 at two ends of the power rollers 4.8;
the guiding rollers have a rolling friction function, thus reducing frictional resistance during operation of the reciprocating impact part supported by sliding friction; the guiding rollers greatly increase absorption on an impact reactive force, thus realizing good running effect, simple structure, less easily-damaged parts, low production cost and stable performance;
the remaining is the same as the embodiment 2.

Embodiment 58

[0253] As shown in Fig. 80, a wear-resistant impact mining machine, one end of the power impact element 4.1 and a rolling piston 4.5 are connected, and may be also separated or integrated etc.; the other end of the power impact element 4.1 and an impact head 6 are connected, and may be also integrated or separated etc.;
a sealing element 14 etc. is provided on the piston 4.5; the sealing element 14 is provided in the middle of the piston 4.5; power rollers 4.8 are provided at two ends of the sealing elements 14;
the remaining is the same as the embodiment 57.

Embodiment 59

[0254] As shown in Fig. 81, a wear-resistant impact mining machine, one end of the power impact element 4.1 and a rolling piston 4.5 are integrated, and may be also separated or connected etc.; the other end of the power impact element 4.1 and an impact head 6 are separated, and may be also integrated or connected etc.;
the remaining is the same as the embodiment 57.

Embodiment 60

[0255] As shown in Fig. 82, a wear-resistant impact mining machine, the impact drive device 4 comprises a rolling guiding rolling piston hydraulic drive device or a rolling guiding rolling piston pneumatic drive device etc.; the rolling guiding rolling piston hydraulic drive device or the rolling guiding rolling piston pneumatic drive device comprises a cylinder 4.4, a piston 4.5, power rollers 4.8, guiding rollers 5.3, a guiding support 5.2, a control element 4.6 and a power impact element 4.1 etc.; the power rollers 4.8 are provided in the piston 4.5 to form a rolling piston 4.5; the rolling piston 4.5 is provided in the cylinder 4.4; the rolling piston 4.5 and the cylinder 4.4 are supported by the power rollers 4.8 to have rolling friction; the guiding rollers 5.3 are provided between the guiding support 5.2 and the power impact element 4.1; the guiding rollers 5.3, the guiding support 5.2 and the power impact element 4.1 are matched closely so that the guiding rollers 5.3 support through rolling friction the power impact element 4.1 to reciprocate and control an impact direction of the power impact element 4.1; the guiding rollers 5.3 are provided between the cylinder 4.4 and the power impact element 4.1; the power impact element 4.1, the cylinder 4.4 and the guiding rollers 5.3 are matched closely to form rolling guiding to the power impact element 4.1; the guiding support 5.2 and the cylinder 4.4 are integrated; the control element 4.6 controls flowing of a liquid or a gas; the rolling piston 4.5 is pushed by the pressure of the liquid or the gas to reciprocate; the piston 4.5 drives the power impact element 4.1 to drive an impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the rolling guiding rolling piston hydraulic drive device or the rolling guiding rolling piston pneumatic drive device;
the guiding rollers have a rolling friction function, thus reducing frictional resistance during operation of the reciprocating impact part supported by sliding friction; the guiding rollers greatly increase absorption on an impact reactive force, thus realizing good running effect, simple structure, less easily-damaged parts, low production cost and stable performance;
the remaining is the same as the embodiment 57.

Embodiment 61

[0256] As shown in Fig. 83, a wear-resistant impact mining machine, the impact drive device 4 comprises a rolling guiding rolling piston hydraulic drive device or a rolling guiding rolling piston pneumatic drive device etc.; the rolling guiding rolling piston hydraulic drive device or the rolling guiding rolling piston pneumatic drive device comprises a cylinder 4.4, a piston 4.5, power rollers 4.8, guiding rollers 5.3, a guiding support 5.2, a control element 4.6 and a power impact element 4.1 etc.; the power rollers 4.8 are provided in the piston 4.5 to form a rolling piston 4.5; the rolling piston 4.5 is provided in the cylinder

4.4; the rolling piston 4.5 and the cylinder 4.4 are supported by the power rollers 4.8 to have rolling friction; the guiding rollers 5.3 are provided between the guiding support 5.2 and the power impact element 4.1; the guiding rollers 5.3, the guiding support 5.2 and the power impact element 4.1 are matched closely so that the guiding rollers 5.3 support through rolling friction the power impact element 4.1 to reciprocate and control an impact direction of the power impact element 4.1;
the guiding support 5.2 and the cylinder 4.4 are separated; the control element 4.6 controls flowing of a liquid or a gas; the rolling piston 4.5 is pushed by the pressure of the liquid or the gas to reciprocate; the piston 4.5 drives the power impact element 4.1 to drive an impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the rolling guiding rolling piston hydraulic drive device or the rolling guiding rolling piston pneumatic drive device;
the remaining is the same as the embodiment 57.

Embodiment 62

[0257] As shown in Fig. 84, a wear-resistant impact mining machine, the guiding device 5 comprises a guiding support 5.2 and an impact guiding element 5.1 etc.; a raceway 16.2 etc. is provided on the guiding support 5.2; a pit 16.1 etc. is provided on the impact guiding element 5.1; the raceway 16.2 and the pit 16.1 are guiding position-limiting structures 16; the guiding position-limiting structures 16 limit an impact direction of the impact guiding element 5.1; or a rolling piston hydraulic drive device or a rolling piston pneumatic drive device comprises a cylinder 4.4, a piton 4.5 and power rollers 4.8 etc.; a pit 16.1 etc. is provided on the cylinder 4.4 and the piston 4.5; the pit 16.1 is a piston position-limiting structure; the power rollers 4.8 are provided in the piston position-limiting structure; the piston position-limiting structure limits a rolling space and potion of the power rollers 4.8;
the guiding position-limiting structures 16 and the piston position-limiting structure are pits or raceways or retainers or position-liming blocks or position-liming plates or position-liming grooves or position-liming rings or position-liming platforms or position-liming sleeves or ball end shafts or bearings or reciprocating stroke sections etc.;
the remaining is the same as the embodiment 57.

Embodiment 63

[0258] As shown in Fig. 85, a wear-resistant impact mining machine, the guiding device 5 comprises a guiding support 5.2 and an impact guiding element 5.1 etc.; a retainer 16.3 etc. is provided between the guiding support 5.2 and the impact guiding element 5.1; the retainer 16.3 is a guiding position-limiting structure 16; the guiding position-limiting structure 16 limits an impact direction of the impact guiding element 5.1; or a rolling piston hydraulic drive device or a rolling piston pneumatic drive device comprises a cylinder 4.4, a piton 4.5 and power rollers 4.8 etc.; a position-limiting platform etc. is provided on the piston 4.5; the position-limiting platform is a piston position-limiting structure; the power rollers 4.8 are provided in the piston position-limiting structure; the piston structure-limiting structure limits a rolling space and position of the power rollers 4.8;
the guiding position-limiting structures 16 and the piston position-limiting structure are pits or raceways or retainers or position-liming blocks or position-liming plates or position-liming grooves or position-liming rings or position-liming platforms or position-liming sleeves or ball end shafts or bearings or reciprocating stroke sections etc.;
the remaining is the same as the embodiment 57.

Embodiment 64

[0259] As shown in Fig. 86, a wear-resistant impact mining machine, the impact drive device 4 comprises a rolling piston impact drive device etc.; the rolling piston impact drive device or a guiding device 5 comprises a position-limiting structure etc.; the position-limiting structure comprises a piston position-limiting structure or a guiding position-limiting structure 16 etc.; the rolling piston drive device comprises a cylinder 4.4, a piton 4.5 and power rollers 4.8 etc.; a pit 16.1 etc. is provided on the piston 4.5; the pit 16.1 is a piston position-limiting structure; the power rollers 4.8 are provided in the piston position-limiting structure; the piston position-limiting structure limits a rolling space and position of the power rollers 4.8;
the guiding device 5 comprises a guiding support 5.2, guiding rollers 5.3 and an impact guiding element 5.1 etc.; a pit 16.1 etc. is provided on the guiding support 5.2; a raceway 16.2 etc. is provided on the impact guiding element 5.1; the pit 16.1 and the raceway 16.2 are guiding position-limiting structures 16; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1 and is provided in the guiding position-limiting structures 16; the guiding position-limiting structures 16 limit a rolling space and position of the guiding rollers 5.3; a damage-prevention mechanism 17 etc. is provided at two ends of a power impact element 4.1; the damage-prevention mechanism 17 is matched with the guiding device 5; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the damage-prevention mechanism 17; the damage-prevention mechanism 17 isolates the reactive damage force so that the reactive damage force is applied to the guiding device 5, thus preventing the impact drive device 4 from being damaged by the impact reactive damage force; the guiding device 5 centralizes an impact direction of the impact head 6;
a buffering element 9.7 etc. is provided between a jacking device 9 fixing support 9.5 and a jacking device 9 buffering support 9.6; a buffering guiding element 9.8 is provided on the jacking device 9 fixing support 9.5 and the

jacking device 9 buffering support 9.6 to form a structural buffering mechanism with an reciprocating impact part 3 etc.; the structural buffering mechanism absorbs an impact reactive force through the buffering element 9.7 while controlling a buffering direction with the buffering guiding element 9.8;
the piston position-limiting structure may be also provided on the cylinder 4.4 and/or the power rollers 4.8;
the guiding position-limiting structure and the piston position-limiting structure are pits or raceways or retainers or position-liming blocks or position-liming plates or position-liming grooves or position-liming rings or position-liming platforms or position-liming sleeves or ball end shafts or bearings or reciprocating stroke sections etc.;
a damage-prevention mechanism may be also provided at one end of the power impact element; the damage-prevention mechanism may be provided as a rotating structure or a split structure etc.; the rotating structure of the damage-prevention mechanism comprises a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type damage-prevention mechanism etc.;
the buffering element may be also provided between a frame and the jacking device or between the jacking device and the reciprocating impact part etc.;
the buffering guiding element may be also provided on the frame and the jacking device or on the jacking device etc.;
the remaining is the same as the embodiment 2.

Embodiment 65

[0260] As shown in Fig. 87 to Fig. 88, a wear-resistant impact mining machine, the impact drive device 4 comprises a power support 4.3 etc.; a guiding device 5 comprises a guiding support 5.2 etc.; the power support 4.3 and the guiding support 5.2 are separated; the guiding device 5 further comprises a rotation-prevention mechanism 25 etc.; the rotation-prevention mechanism 25 comprises a rotation-prevention guiding support 5.2 and/or a rotation-prevention impact guiding element 5.1 etc.; the rotation-prevention guiding support 5.2 comprises a quadrilateral rotation-prevention guiding support 5.2 etc.; the rotation-prevention impact guiding element 5.1 comprises a quadrilateral rotation-prevention impact guiding element 5.1 etc.; guiding rollers 5.3 are provided between the rotation-prevention guiding support 5.2 and the rotation-prevention impact guiding element 5.1; the rotation-prevention guiding support 5.2, the guiding rollers 5.3 and the rotation-prevention impact guiding element 5.1 are matched with each other and the rotation-prevention mechanism 25 prevents an impact head 6 from rotating and centralizes an impact direction of the impact head 6;
the power support 4.3 and the guiding support 5.2 may be also integrated or connected etc.;
the rotation-prevention guiding support may also apply a U-shaped guiding support or a V-shaped guiding support or a triangular guiding support or an oval guiding support or a polygonal guiding support or an irregular guiding support or a raceway guiding support or a pit guiding support or a reciprocating stroke section guiding support or a retainer guiding support etc.;
the rotation-prevention impact guiding element may also apply a U-shaped impact guiding element or a V-shaped impact guiding element or a triangular impact guiding element or an oval impact guiding element or a polygonal impact guiding element or an irregular impact guiding element or a pit impact guiding element or a reciprocating stroke impact guiding element or a raceway impact guiding element or a retainer impact guiding element etc.;
the remaining is the same as the embodiment 2.

Embodiment 66

[0261] As shown in Fig. 89, a wear-resistant impact mining machine, the rotation-prevention guiding support 5.2 applies a U-shaped guiding support 5.2 and the rotation-prevention impact guiding element 5.1 applies a U-shaped impact guiding element 28;
the remaining is the same as the embodiment 65.

Embodiment 67

[0262] As shown in Fig. 90, a wear-resistant impact mining machine, the rotation-prevention guiding support 5.2 applies a triangular guiding support 5.2 and the rotation-prevention impact guiding element 5.1 applies a triangular impact guiding element 5.1;
the remaining is the same as the embodiment 65.

Embodiment 68

[0263] As shown in Fig. 91 to Fig. 92, a wear-resistant impact mining machine, the impact drive device 4 comprises a power support 4.3 etc.; the guiding device 5 comprises a guiding support 5.2 etc.; the power support 4.3 and the guiding support 5.2 are integrated; the rotation-prevention guiding support 5.2 applies an oval guiding support 5.2; the triangular impact guiding element 5.1 comprises an oval impact guiding element 5.1 etc.;
the remaining is the same as the embodiment 65.

Embodiment 69

[0264] As shown in Fig. 93 to Fig. 95, a wear-resistant impact mining machine, the guiding device 5 comprises guiding rollers 5.3, a guiding support 5.2 and an impact guiding element 5.1 etc.; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; the guiding device 5 comprises an external sleeve 26 and an internal body 27 etc.; a raceway 16.2 etc. is provided on the external sleeve 26 or the internal body 27; the guiding rollers 5.3 are provided in the raceway 16.2 and are provided between the exter-

nal sleeve 26 and the internal body 27; the external sleeve 26, the internal body 27 and the guiding rollers 5.3 are matched closely so that the external sleeve 26 or the internal body 27 reciprocates oppositely through rolling friction of the guiding rollers 5.3; an impact direction of the external sleeve 26 or the internal body 27 is controlled through rolling fiction; the impact head 6 is integrated or connected with the reciprocating external sleeve 26 or internal body 27;
the remaining is the same as the embodiment 2.

Embodiment 70

[0265] As shown in Fig. 96, a wear-resistant impact mining machine, the guiding device 5 comprises an external sleeve 26 and an internal body 27 etc.; a pit 16.1 etc. is provided on the external sleeve 26 or the internal body 27; guiding rollers 5.3 are provided in the pit 16.1 and are provided between the external sleeve 26 and the internal body 27; a guiding support 5.2 is the external sleeve 26; an impact guiding element 5.1 is the internal body 27; the external sleeve 26 supports the guiding rollers 5.3 and the internal body 27; the external sleeve 26, the internal body 27 and the guiding rollers 5.3 are matched closely so that the external sleeve 26 or the internal body 27 reciprocates oppositely through rolling friction of the guiding rollers 5.3; an impact direction of the internal body 27 is controlled through rolling friction; an impact head 6 is integrated or connected with the reciprocating internal body 27; the impact head 6 is supported by the reciprocating internal body 27 to reciprocate with rolling friction;
the guiding support may be also an internal body; the impact guiding element is an external sleeve; the internal body supports the guiding rollers and the external sleeve; the remaining is the same as the embodiment 2.

Embodiment 71

[0266] As shown in Fig. 97 to Fig. 98, a wear-resistant impact mining machine, the guiding device 5 comprises an external sleeve 26 and an internal body 27 etc.; a retainer 16.3 etc. is provided between the external sleeve 26 and the internal body 27; guiding rollers 5.3 are provided in the retainer 5.3 and are provided between the external sleeve 26 and the internal body 27; a guiding support 5.2 is the internal body 27; an impact guiding element 5.1 is the external sleeve 26; the internal body 27 supports the guiding rollers 5.3 and the external sleeve 26; the external sleeve 26, the internal body 27 and the guiding rollers 5.3 are matched closely so that the external sleeve 26 reciprocates oppositely through rolling friction of the guiding rollers 5.3; an impact direction of the external sleeve 26 is controlled through rolling friction;
the guiding support may be also an external sleeve; the impact guiding element is an internal body; the external sleeve supports the guiding rollers and the internal body; the remaining is the same as the embodiment 2.

Embodiment 72

[0267] As shown in Fig. 99, a wear-resistant impact mining machine, the guiding device 5 is combined with a crank impact drive device 4.2 etc. in a jacking device 9; the crank impact drive device 4.2 comprises a power impact element 4.1 etc.; one end of the power impact element 4.1 is provided with a damage-prevention mechanism 17 etc.; the damage-prevention mechanism 17 is provided as a rotating structure; the rotating structure of the damage-prevention mechanism 17 applies a ball cage universal joint; the rotating structure of the damage-prevention mechanism 17 is matched with the guiding device 5; the power impact element 4.1 drives an impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the rotating structure; the rotating structure is stressed to rotate to isolate the reactive damage force, thus preventing the crank impact drive device 4.2 from being damaged by the impact reactive damage force;
the jacking device 9 comprises a rotation power source element 9.11 and a rotation impact transmission element 9.12 etc.; the rotation power source element 9.11 comprises an electric machine etc.; the jacking device 9 comprises a fixing support 9.5 and a buffering support 9.6 etc.; a buffering device etc. is provided between the fixing support 9.5 and the buffering support 9.6; the buffering device comprises a rotation power buffering device and a structure guiding buffering device etc.;
the rotation power buffering device is provided between the rotation power source element 9.11 and the rotation impact transmission element 9.12 or is provided in the rotation impact transmission element 9.12; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering mechanism 20 or a belt buffering mechanism 21 etc.;
the sliding stroke spline shaft housing buffering mechanism 20 comprises a spline shaft 20.1 and a spline housing 20.2 etc.; a sliding reciprocating stroke section is provided between the spline shaft 20.1 and the spline housing 20.2; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force;
the belt buffering mechanism 21 comprises a driving pulley 21.1, a driven pulley 21.2 and a belt 21.3 etc.; the driving pulley 21.1 is fixed on the fixing support 9.5; the driving pulley 21.1 is connected with a drive shaft of the electric machine or a hydraulic motor or a pneumatic motor etc.; the driven pulley 21.2 is provided on the buffering support 9.6; the belt 21.3 is provided on the driving pulley 21.1 and the driven pulley 21.2; the driven pulley 21.2 moves as the buffering support 9.6 is impacted; the belt 21.3 absorbs an impact reactive force; the belt buffering mechanism 21 prevents the electric machine or the hydraulic motor or the pneumatic motor etc. from being damaged;
the structure guiding buffering device comprises a buff-

ering element 9.7 and a buffering guiding element 9.8 etc.; the buffering element 9.7 is provided between the fixing support 9.5 and the buffering support 9.6; the buffering guiding element 9.8 is provided on the fixing support 9.5 and the buffering support 9.6; the structure guiding buffering device absorbs an impact reactive force through the buffering element 9.7 while controlling a buffering direction through the buffering guiding element 9.8; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering mechanism 20 or the belt buffering mechanism 21 to absorb and buffer an impact reactive force of a reciprocating impact part 3 and control a buffering direction, thus preventing the rotation power source element 9.11 or the jacking device 9 or a frame 19 etc. from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head 6 faces an object to be mined;

the guiding device 5 may be also combined with the crank impact drive device 4.2 in the frame 19 etc.;

two ends of the power impact element 4.1 may be also provided with damage-prevention mechanisms;

the rotating structure of the damage-prevention mechanism 17 may also apply a joint bearing, a turning joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type damage-prevention mechanism etc.;

the rotation power source element 9.11 and the rotation impact transmission element 9.12 may be also provided on the reciprocating impact part 3 or the jacking device 9 or the frame 19 etc.; or when the frame 19 comprises the rotation power source element 9.11, the jacking device 9 comprises the rotation impact transmission element 9.12; or when the jacking device 9 comprises the rotation power source element 9.11, the reciprocating impact part 3 comprises the rotation impact transmission element 9.12;

the rotation power source element 9.11 may be also a hydraulic motor or a pneumatic motor etc.;

the buffering element 9.7 may be also provided between the frame 19 and the reciprocating impact part 3 or provided between the jacking device 9 and the reciprocating impact part 3 or provided between the frame 19 and the jacking device 9 etc.;

the buffering guiding element 9.8 is provided on the frame 19 and the reciprocating impact part 3 or is provided on the jacking device 9 and the reciprocating impact part 3 or is provided on the frame 19 and the jacking device 9 etc.;

the remaining is the same as the embodiment 2.

Embodiment 73

[0268] As shown in Fig. 100 to Fig. 101, a wear-resistant impact mining machine comprises an impact drive device 4 and a guiding device 5 etc.; the guiding device 5 comprises guiding rollers 5.3, a guiding support 5.2 and an impact guiding element 5.1 etc.; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; the guiding device 5 further comprises a retainer 16.3, and a raceway 16.2 etc.; the guiding rollers 5.3 comprises rolling shafts 5.3.3 etc.; the retainer 16.3 is provided between the guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3, i.e. the rolling shafts 5.3.3 are provided in the retainer 16.3; the thickness of the retainer 16.3 is smaller than the diameter of the guiding rollers 5.3; two parts of the guiding rollers 5.3 higher than the retainer 16.3 are respectively provided on the guiding support 5.2 and the impact guiding element 5.1; a raceway 16.2 etc. is provided on the guiding support 5.2 or the impact guiding element 5.1; the guiding rollers 5.3 are provided in the retainer 16.3 and are provided in the raceway 16.2; the retainer 16.3 and the raceway 16.2 limit a rolling space of the guiding rollers 5.3; the guiding rollers 5.3 roll against the raceway 16.2; the guiding support 5.2, the impact guiding element 5.1 and the guiding rollers 5.3 in the retainer 16.3 and in the raceway 16.2 are matched closely so that the impact guiding element 5.1 reciprocates with rolling friction; an impact direction of the impact guiding element 5.1 is controlled through rolling friction; the impact guiding element 5.1 is connected with an impact head 6;

the impact drive device 4 comprises a power impact element 4.1 etc.; two ends of the power impact element 4.1 are provided with damage-prevention mechanisms 17; one end is provided with a damage-prevention mechanism 17 with a rotating structure and the other end is provided a damage-prevention mechanism 17 with a split structure; the rotating structure of the damage-prevention mechanism 17 comprises a cross universal joint etc.; the rotating structure or the split structure of the damage-prevention mechanisms 17 is used in a matched manner with the guiding device 5; the power impact element 4.1 drives the impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the rotating structure or the split structure; the rotating structure is stressed to rotate or the split structure isolates the reactive damage force in a split manner;

a structure guiding buffering device etc. is provided on the jacking device 9, or is provided between the jacking device 9 and a frame 19; the structure guiding buffering device absorbs and buffers the reactive damage force generated by the impact of the impact head 6;

the impact guiding element 5.1 and the impact head 6 may be also integrated;

a damage-prevention mechanism 17 further comprises a joint bearing, a turning joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type damage-prevention mechanism etc.;

the remaining is the same as the embodiment 2.

Embodiment 74

[0269] As shown in Fig. 102 to Fig. 104, a wear-resist-

ant impact mining machine comprises an impact drive device 4 and a guiding device 5 etc.; the guiding device 5 and the impact drive device 4 etc. are combined into two or more reciprocating impact parts 3; two or more reciprocating impact parts 3 are arranged up and down to increase the mining height;
the impact drive device 4 comprises a power impact element 4.1 etc.; a damage-prevention mechanism 17 etc. is provided on two ends of the power impact element 4.1; the damage-prevention mechanism 17 is provided as a rotating structure; the rotating structure of the damage-prevention mechanism 17 comprises a ball end catching groove type 17.5 etc.; the rotating structure of the damage-prevention mechanism 17 is matched with the guiding device 5; the power impact element 4.1 drives an impact head 6 to impact; a reactive damage force generated by an impact of the impact head 6 on a coal wall or a rock wall is applied to the rotating structure; the rotating structure is stressed to rotate to isolate the reactive damage force; the power impact element 4.1 drives the impact head 6 to impact; the reactive damage force generated by the impact of the impact head 6 on a coal wall or a rock wall is applied to the guiding device 5, thus preventing the impact drive device 4 from being damaged by the impact reactive damage force; the guiding device 5 centralizes an impact direction of the impact head 6, thus ensuring that the next impact of the impact 6 head is applied to an object to be mined;
the jacking device 9 comprises a rotation power source element 9.11 and a rotation impact transmission element 9.12 etc.; the rotation power source element 9.11 comprises an electric machine etc.; the jacking device 9 comprises a fixing support 9.5 and a buffering support 9.6 etc.; a buffering device is provided between the fixing support 9.5 and the buffering support 9.6; the buffering device comprises a rotation power buffering device and a structure guiding buffering device etc.;
the rotation power buffering device is provided between the rotation power source element 9.11 and the rotation impact transmission element 9.12 or is provided in the rotation impact transmission element 9.12; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering mechanism 20 or a belt buffering mechanism 21 etc.; the sliding stroke spline shaft housing buffering mechanism 20 comprises a spline shaft 20.1 and a spline housing 20.2 etc.; a sliding reciprocating stroke section is provided between the spline shaft 20.1 and the spline housing 20.2; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force;
the belt buffering mechanism 21 comprises a driving pulley 21.1, a driven pulley 21.2 and a belt 21.3 etc.; the driving pulley 21.1 is fixed on the fixing support 9.5; the driving pulley 21.1 is connected with a drive shaft of the electric machine or a hydraulic motor or a pneumatic motor etc.; the driven pulley 21.2 is provided on the buffering support 9.6; the belt 21.3 is provided on the driving pulley 21.1 and the driven pulley 21.2; the driven pulley 21.2 moves as the buffering support 9.6 is impacted; the belt 21.3 absorbs an impact reactive force; the belt buffering mechanism 21 prevents the electric machine or the hydraulic motor or the pneumatic motor etc. from being damaged;
the structure guiding buffering device comprises a buffering element 9.7 and a buffering guiding element 9.8 etc.; the buffering element 9.7 is provided between the fixing support 9.5 and the buffering support 9.6; the buffering guiding element 9.8 is provided on the fixing support 9.5 and the buffering support 9.6; the structure guiding buffering device absorbs an impact reactive force through the buffering element 9.7 while controlling a buffering direction through the buffering guiding element 9.8; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering mechanism 20 or the belt buffering mechanism 21 etc. to absorb and buffer an impact reactive force of a reciprocating impact part and control a buffering direction, thus preventing the rotation power source element 9.11 or the jacking device 9 or a frame 19 etc. from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined;
a damage-prevention mechanism may be also provided on one end of the power impact element 4.1;
the rotating structure of the damage-prevention mechanism 17 may also apply a joint bearing, a turning joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type damage-prevention mechanism etc.;
the rotation power source element 9.11 and the rotation impact transmission element 9.12 may be also provided on the reciprocating impact part 3 or the jacking device 9 or the frame 19 etc.; or when the frame 19 comprises the rotation power source element 9.11, the jacking device 9 comprises the rotation impact transmission element 9.12; or when the jacking device 9 comprises the rotation power source element 9.11, the reciprocating impact part 3 comprises the rotation impact transmission element 9.12;
the rotation power source element 9.11 may be also a hydraulic motor or a pneumatic motor etc.;
the buffering element 9.7 may be also provided between the frame 19 and the reciprocating impact part 3 or provided between the jacking device 9 and the reciprocating impact part 3 or provided between the frame 19 and the jacking device 9 etc.;
the buffering guiding element 9.8 is provided on the frame 19 and the reciprocating impact part 3 or is provided on the jacking device 9 and the reciprocating impact part 3 or is provided on the frame 19 and the jacking device 9 etc.;
the remaining is the same as the embodiment 2.

Embodiment 75

[0270] As shown in Fig. 105 to Fig. 108, a wear-resist-

ant impact mining machine comprises an impact drive device 4 and a guiding device 5 etc.; the impact drive device 4 comprises a crank impact drive device 4.2 etc.; the crank impact drive device 4.2 comprises a power impact drive device 4.1 etc.; the guiding device 5 and the crank impact drive device 4.2 etc. are combined with two or more reciprocating impact parts 3; two or more reciprocating impact parts 3 are provided at a front part of the jacking device 9; two or more reciprocating impact parts 3 are provided left and right to increase the mining width; the guiding device 5 comprises guiding rollers 5.3, a guiding support 5.2, and an impact guiding element 5.1 etc.; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1;

the reciprocating impact part 3 comprises a supporting box 13 etc.; the crank impact drive device 4.2 comprises a crank component etc.; the crank component drives the power impact element 4.1; the guiding device 5 and the crank component are combined in the supporting box 13; one end of the impact guiding element 5.1 extending out of the supporting box 13 is provided with an impact head 6 and the other end is provided with a counterweight element 7 for preventing the impact head 6 from damaging the guiding device 5, the impact drive device 4 and/or the machine body 1 etc. due to gravity unbalance; two or more ends of the power impact element 4.1 extending out of the supporting box 13 are connected or separated with the impact head 6;

when the guiding device 5 is combined with the crank component at a front part of the jacking device 9, the supporting box 13 supports the crank component, the guiding device 5 and the impact head 6 etc.; the supporting box 13 is provided at a front part of the jacking device 9 or the frame 19;

a guiding roller position-limiting structure etc. is provided between the guiding support 5.2 or the impact guiding element 5.1; the guiding roller position-limiting structure limits a rolling space of the guiding rollers 5.3; the guiding rollers 5.3, the guiding support 5.2 and the impact guiding element 5.2 are matched closely so that the guiding rollers 5.3 provided in the guiding roller position-limiting structure support the impact guiding element 5.1 to reciprocate through rolling friction and control an impact direction of the impact guiding element 5.1;

two or more reciprocating impact part 3 may be also provided at a frame part of the frame 19;

two ends of the impact guiding element 5.1 extending out of the supporting box 13 may be also provided with impact heads or only one end is provided with an impact head;

the remaining is the same as the embodiment 74.

Embodiment 76

[0271] As shown in Fig. 109, a wear-resistant impact mining machine comprises a reciprocating impact part 3 etc.; the reciprocating impact part 3 comprises a guiding device 5 and an impact drive device 4 etc.; the impact drive device 4 comprises a crank impact drive device 4.2, a hydraulic impact drive device or the pneumatic impact drive device etc.; the crank impact drive device 4.2, the hydraulic impact drive device or the pneumatic impact drive device comprises a power impact element 4.1 etc.; a damage-prevention mechanism 17 etc. is provided at one end or two ends of the power impact element 4.1; the damage-prevention mechanism 17 comprises a rotating structure and a split structure etc.; the guiding device 5 comprises the guiding roller support 5.2, and the impact guiding element 5.1 etc.; the guiding roller support 5.2 comprises a guiding roller support upper element 5.2.1, and a guiding roller support lower element 5.2.2 etc.; the impact guiding element 5.1 is a U-shaped impact guiding element 28; the U-shaped impact guiding element 28 comprises an impact guiding element upper element 28.1 and a impact guiding element lower element 28.2 etc.; a raceway 16.2 is provided in the guiding roller support upper element 5.2.1, and the guiding roller support lower element 5.2.2; or a raceway 16.2 is provided in the impact guiding element upper element 28.1 and the impact guiding element lower element 28.2; or a raceway 16.2 is provided in the guiding roller support upper element 5.2.1, the guiding roller support lower element 5.2.2, the impact guiding element upper element 28.1 and the impact guiding element lower element 28.2; the guiding rollers 5.3 are provided between the guiding roller support upper element 5.2.1 and the impact guiding element upper element 28.1, and is provided between the guiding roller support lower element 5.2.2 and the impact guiding element lower element 28.2 and is provided in the raceway 16.2; the guiding rollers 5.3 provided in the raceway 16.2, the U-shaped impact guiding element 28 and the guiding roller support 5.2 are matched closely so that the guiding rollers 5.3 support the U-shaped impact guiding element 28 to reciprocate with rolling friction and control a reciprocating direction of the U-shaped impact guiding element 28 and centralize an impact direction of the impact head 6; the U-shaped impact guiding element 28 and the impact head 6 are connected or integrated; the power impact element 4.1 and the impact head 6 are connected or separated; the power impact element 4.1 drives the impact head 6 to impact; the rotating structure of the damage-prevention mechanism 17 is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element 4.1 does not guide the impact head 6 and is not damaged by the damage force;

the raceway 16.2 may be also provided on the impact guiding element upper element 28.1 and the impact guiding element lower element 28.2 or provided on the guiding roller support upper element 5.2.1, the guiding roller support lower element 5.2.2, the impact guiding element upper element 28.1 and the impact guiding element lower element 28.2;

the impact drive device 4 may be also a hydraulic impact drive or a pneumatic impact drive device etc.;

two ends of the power impact element 4.1 may be also

provided with damage-prevention mechanisms and the damage-prevention mechanisms may be also split structures;
the remaining is the same as the embodiment 2.

Embodiment 77

[0272] As shown in Fig. 110, a wear-resistant impact mining machine, the reciprocating impact part 3 comprises a guiding device 5 and an impact drive device 4; the impact drive device 4 comprises a hydraulic impact drive device or a pneumatic impact drive device; the hydraulic impact drive device or the pneumatic impact drive device comprises a power impact element 4.1; a damage-prevention mechanism 17 is provided on one end of the power impact element 4.1; the damage-prevention mechanism 17 comprises a rotating mechanism;
the guiding device 5 comprises an external sleeve 26, an internal body 27 and guiding bodies 5.3; the internal body 27 is a frame-shaped internal body 27, comprising a frame-shaped external sleeve upper element 27.1 and a frame-shaped external sleeve lower element 27.2; the frame-shaped external sleeve upper element 27.1 and the frame-shaped external sleeve lower element 27.2 comprise a raceway 16.2; the external sleeve 26 comprises an external sleeve upper element 26.1 and an external body lower element 26.2; the external sleeve upper element 26.1 and the external body lower element 26.2 comprise a pit 16.1; the guiding rollers 5.3 are provided between the frame-shaped external sleeve upper element 27.1 and the external sleeve upper element 26.1 and are provided between the frame-shaped external sleeve lower element 27.2 and the external body lower element 26.2; the external sleeve 26, the frame-shaped internal body 27 and the guiding rollers 5.3 provided in the pit 16.1 are matched closely so that the guiding rollers 5.3 support the frame-shaped internal body 27 to reciprocate with rolling friction and control a reciprocating direction of the frame-shaped internal body 27 and centralize an impact direction of an impact head 6; the frame-shaped internal body 27 and the impact head 6 are connected or separated or integrated; the power impact element 4.1 and the impact head 6 are connected or separated; the power impact element 4.1 drives the impact head 6 to impact; the rotating structure of the damage-prevention mechanism 17 is stressed to rotate or a split structure isolates an impact reactive damage force in a split manner; the power impact element 4.1 does not guide the impact head 6 and is not damaged by the damage force;
the power impact device 4 may be also a crank impact drive device 4.2;
two ends of the power impact element 4.1 may be also provided with damage-prevention mechanisms; the damage-prevention mechanism may be also split structures;
the remaining is the same as the embodiment 2.

Embodiment 78

[0273] As shown in Fig. 111 to Fig. 112, a wear-resistant impact mining machine, the reciprocating impact part 3 comprises a guiding device 5 and an impact drive device 4; the impact drive device 4 comprises a crank impact drive device 4.2 or a hydraulic impact drive device or a pneumatic impact drive device; the crank impact drive device 4.2 or the hydraulic impact drive device or the pneumatic impact drive device comprises a power impact element 4.1; a damage-prevention mechanism 17 is provided on two ends of the power impact element 4.1; the damage-prevention mechanism 17 comprises a rotating mechanism or a split structure;
the guiding device 5 comprises an external sleeve 26, an internal body 27 and the guiding rollers 5.3; the external sleeve 26 is a cylindrical external sleeve 26.3; the guiding rollers 5.3 are provided between the internal body 27 and the cylindrical external sleeve 26.3; the guiding rollers 5.3, the cylindrical external sleeve 26.3 and the internal body 27 are matched closely so that the guiding rollers 5.3 support the cylindrical external sleeve 26.3 to reciprocate with rolling friction and control a reciprocating direction of the cylindrical external sleeve 26.3; the cylindrical external sleeve 26.3 and an impact head 6 are connected, separated or integrated; the power impact element 4.1 and the impact head 6 are connected, separated or integrated; the power impact element 4.1 drives the impact head 6 to impact; the rotating structure of the damage-prevention mechanism 17 is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element 4.1 does not guide the impact head 6 and is not damaged by the damage force;
the remaining is the same as the embodiment 2.

Embodiment 79

[0274] As shown in Fig. 113, a wear-resistant impact mining machine, the impact drive device 4 is a crank impact drive device 4.2; the crank impact drive device 4.2 comprises a power source element 9.11, a cam shaft 29 and a cam 30; the power source element 9.11 drives the cam shaft 29 to rotate; the cam 30 installed on the cam shaft 29 drives an impact head 6 to reciprocate;
the remaining is the same as the embodiment 2.

Embodiment 80

[0275] As shown in Fig. 114, a wear-resistant impact mining machine, the impact drive device 4 is a crank impact drive device 4.2; the crank impact drive device 4.2 comprises a power source element 9.11, an eccentric shaft 22.1.3 and a power impact element 4.1; the eccentric shaft 22.1.3 is hinged with one end of the power impact element 4.1; the power source element 9.11 drives the eccentric shaft 22.1.3 to rotate; the eccentric shaft 22.1.3 drives the power impact element 4.1 to recipro-

cate;
the remaining is the same as the embodiment 2.

Embodiment 81

[0276] As shown in Fig. 115, a wear-resistant impact mining machine, the impact drive device 4 comprises a crank slider impact drive device 4; the crank slider impact drive device 4 comprises a power source element 9.11, a crank, a slider, an oscillating bar, a connecting rod 22.2 and a power impact element 4.1; one end of the crank is connected with the power source element 9.11 and the other end is hinged with the slider; the slider is connected with the oscillating bar and is capable of sliding on the oscillating bar; the oscillating bar is hinged with the connecting rod 22.2; the connecting rod 22.2 is hinged with one end of the power impact element 4.1; the power source element 9.11 drives the crank to rotate; the crank drives the slider so that the oscillating bar oscillates; through the connecting rod 22.2, the oscillating bar drives the power impact element 4.1 to move;
the remaining is the same as the embodiment 2.

Embodiment 82

[0277] As shown in Fig. 116, a wear-resistant impact mining machine, the guiding device comprises guiding rollers 5.3, a guiding support 5.2 and an impact guiding element 5.1; the section of the guiding support 5.2 is shaped as a circular ring; the section of the impact guiding element 5.1 is shaped as a multi-rhombus key; the guiding support 5.2 with a circular ring-shaped section and the multi-rhombus key-shaped impact guiding element 5.1 are matched to form a guiding roller position-limiting structure; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3, the guiding support 5.2 and the impact guiding element 5.1 are matched closely to have rolling guiding;
as shown in Fig. 117, a wear-resistant impact mining machine, the guiding device comprises guiding rollers 5.3, a guiding support 5.2 and an impact guiding element 5.1; the section of the guiding support 5.2 is shaped as a pentagon; the section of the impact guiding element 5.1 is shaped as a pentagon; the pentagonal guiding support 5.2 and impact guiding element 5.1 are provided with a lug boss; a groove is provided on the guiding rollers 5.3; the guiding support 5.2 with a pentagonal section, the pentagonal impact guiding element 5.1 and the guiding grooves 5.3 with grooves are matched to form a guiding roller position-limiting structure; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3, the guiding support 5.2 and the impact guiding element 5.1 are matched closely to have rolling guiding;
as shown in Fig. 118, a wear-resistant impact mining machine, the guiding device comprises guiding rollers 5.3, a guiding support 5.2 and an impact guiding element 5.1; the section of the guiding support 5.2 is shaped as a circular ring; the section of the impact guiding element 5.1 is circular; the guiding rollers 5.3 are rolling drums; the generatrix radius of the outer surfaces of the rolling drums is the same as the internal diameter of the circular ring-shaped section of the guiding support 5.2; grooves matched with the outer surfaces of the rolling drums are provided in a radial direction of the circular impact guiding element 5.1; the guiding support 5.2 with a circular ring-shaped section, the circular impact guiding element 5.1 and the rolling drums are matched to form a guiding roller position-limiting structure; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3, the guiding support 5.2 and the impact guiding element 5.1 are matched closely to have rolling guiding;
as shown in Fig. 119, the guiding device comprises guiding rollers 5.3, a guiding support 5.2 and an impact guiding element 5.1; the section of the guiding support 5.2 is V-shaped; the section of the impact guiding element 5.1 is triangular; the guiding rollers are concave rolling columns; bumps matched with the outer surfaces of the concave rolling columns are provided on the V-shaped inner side face of the guiding support 5.2 and the outer surface of the triangular impact guiding element 5.1 along a radial direction; the guiding support 5.2 with a V-shaped section, the triangular impact guiding element 5.1 and the concave rolling columns are matched to form a guiding roller position-limiting structure; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3, the guiding support 5.2 and the impact guiding element 5.1 are matched closely to have rolling guiding;
as shown in Fig. 120, a wear-resistant impact mining machine, the guiding device 5 comprises guiding rollers 5.3, a guiding support 5.2 and an impact guiding element 5.1; the section of the guiding support 5.2 is shaped as a semicircular ring; the section of the impact guiding element 5.1 is semicircular; a rolling drum is provided between semicircular tops on which the guiding support 5.2 and the impact guiding element 5.1 are matched and a lug boss rolling column is provided at the lower part; a raceway 16.2 matched with the lug boss rolling column is provided on the guiding support 5.2 and the impact guiding element 5.1; the guiding support 5.2, the raceway 16.2 on the impact guiding element 5.1 and the lug boss rolling column are matched to form a guiding roller position-limiting structure; the guiding rollers 5.3, the guiding support 5.2 and the impact guiding element 5.1 are matched closely to have rolling guiding;
as shown in Fig. 121 and Fig. 122, the reciprocating rolling device comprises guiding rollers 5.3, a guiding support 5.2 and an impact guiding element 5.1; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; a position-limiting structure 16 is provided on the impact guiding element 5.1, the guiding support 5.2 and/or the guiding rollers 5.3; the position-limiting structure 16 is provided as a raceway

16.2; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3 support the impact guiding element 5.1 to reciprocate along the guiding support 5.2; the position-limiting structure 16 limits a rolling space and position of the guiding rollers 5.3; the position-limiting structure 16 and a rolling support are connected, separated or integrated; or the position-limiting structure 16 and the impact guiding element 5.1 are connected, separated or integrated; or the position-limiting structure 16 and the guiding rollers 5.3 are connected, separated or integrated;

as shown in Fig. 123 and Fig. 124, a position-limiting structure 16 is provided on an impact guiding element 5.1; the position-limiting structure 16 is a pit 16.1; guiding rollers 5.3 are provided between a guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3 support the impact guiding element 5.1 to reciprocate along the guiding support 5.2; the position-limiting structure 16 limits a rolling space or position of the guiding rollers 5.3; the position-limiting structure 16 is separated with a rolling support, integrated with the impact guiding element 5.1 and separated with the guiding rollers 5.3;

as shown in Fig. 125 and Fig. 126, a position-limiting structure 16 is provided on an impact guiding element 5.1; the position-limiting structure 16 is a reciprocating stroke section 16.4; guiding rollers 5.3 are provided between a guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3 support the impact guiding element 5.1 to reciprocate along the guiding support 5.2; the position-limiting structure 16 limits a rolling space or position of the guiding rollers 5.3; the position-limiting structure 16 is connected or separated or integrated with a rolling support; or the position-limiting structure 16 is connected or separated or integrated with the impact guiding element 5.1; or the position-limiting structure 16 is connected or separated or separated with the guiding rollers 5.3;

as shown in Fig. 127 and Fig. 128, a position-limiting structure 16 is provided on an impact guiding element 5.1; the position-limiting structure 16 is a retainer 16.3; guiding rollers 5.3 are provided between a guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3 support the impact guiding element 5.1 to reciprocate along the guiding support 5.2; the position-limiting structure 16 limits a rolling space or position of the guiding rollers 5.3; the position-limiting structure 16 is connected or separated or integrated with a rolling support; or the position-limiting structure 16 is connected or separated or integrated with the impact guiding element 5.1; or the position-limiting structure 16 is connected or separated or separated with the guiding rollers 5.3;

as shown in Fig. 129 and Fig. 130, a position-limiting structure 16 is provided on an impact guiding element 5.1; the position-limiting structure 16 is a retaining ring 16.5; guiding rollers 5.3 are provided between a guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3 support the impact guiding element 5.1 to reciprocate along the guiding support 5.2; the position-limiting structure 16 limits a rolling space or position of the guiding rollers 5.3; the position-limiting structure 16 is separated with a rolling support, connected or integrated with the impact guiding element 5.1 and connected or separated or separated with the guiding rollers 5.3;

as shown in Fig. 130 to Fig. 132, a position-limiting structure 16 is provided on an impact guiding element 5.1; the position-limiting structure 16 is a position-limiting platform 16.6; guiding rollers 5.3 are provided between a guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3 support the impact guiding element 5.1 to reciprocate along the guiding support 5.2; the position-limiting structure 16 limits a rolling space or position of the guiding rollers 5.3; the position-limiting structure 16 is connected or separated with a rolling support, or the position-limiting structure 16 is connected or integrated with the impact guiding element 5.1 or the position-limiting structure 16 is connected or separated or separated with the guiding rollers 5.3;

as shown in Fig. 133, a position-limiting structure 16 is provided on an impact guiding element 5.1 and a guiding support 5.2; the position-limiting structure 16 is an internal body 27 matched with an external sleeve 26; the guiding rollers 5.3 are provided between the guiding support 5.2 and the impact guiding element 5.1; the guiding rollers 5.3 support the impact guiding element 5.1 to reciprocate along the guiding support 5.2; the position-limiting structure 16 limits a rolling space or position of the guiding rollers 5.3; the position-limiting structure 16 is connected, separated or integrated with a rolling support; or the position-limiting structure 16 is connected, or separated or integrated with the impact guiding element 5.1; or the position-limiting structure 16 is connected, or separated or integrated with the guiding rollers 5.3;

as shown in Fig. 134 and Fig. 135, the position-limiting structure may be an oval position-limiting structure 16.7;

as shown in Fig. 136 and Fig. 137, the position-limiting structure may be a dumbbell-shaped position-limiting structure 16.8;

as shown in Fig. 138, the position-limiting structure may be a circular column-shaped position-limiting structure 16.9;

as shown in Fig. 139, the position-limiting structure may be a conical position-limiting structure 16.10;

as shown in Fig. 140, the position-limiting structure may be a rolling wheel position-limiting structure 16.11;

as shown in Fig. 141, the position-limiting structure may be a square position-limiting structure 16.12;

as shown in Fig. 142, the position-limiting structure may be a U-shaped position-limiting structure 16.13;

as shown in Fig. 143, the position-limiting structure may be a frame-shaped position-limiting structure 16.14;

as shown in Fig. 144, the position-limiting structure may be an I-shaped position-limiting structure 16.15;

the position-limiting structure further comprises a cylindrical channel or a position-limiting plate or a position-limiting sleeve or a position-limiting rod or a position-lim-

iting shaft or a position-limiting groove or a spherical convex or a lug boss or a bearing or a circular ring or a platform-shaped column or a platform-shaped ball or a platform-shaped drum or a groove-shaped ball or a groove-shaped rolling wheel or a groove-shaped oval or a spline shape or an arc shape or a plate shape or a polygonal shape or a cylinder or a spline housing.

Embodiment 83

[0278] As shown in Fig. 145 and Fig. 146, a wear-resistant impact mining machine, a reciprocating stroke section 16.4 is provided on the impact guiding element; the width of the reciprocating stroke section 16.4 is not larger than the widths of rollers 5.3 rolling in a roller 5.3 rolling direction; the length of the reciprocating stroke section 16.4 is the sum of 1/2 of the stroke of an impact guiding element 5.1 and the maximum radius of the rollers 5.3; the rollers 5.3 are provided between a roller support 5.2 and the impact guiding element 5.1 and are provided in the reciprocating stroke section 16.4; the reciprocating stroke section 16.4 limits a rolling space and position of the rollers 5.3; the rollers 5.3, the roller support 5.2 and the impact guiding element 5.1 are in a rolling friction state during a reciprocating process;
Fig. 147 shows a structure of a reciprocating stroke section 16.4 provided on a roller support 5.2;
the remaining is the same as the embodiment 1.

Embodiment 84

[0279] As shown in Fig. 148, the reciprocating impact part comprises a guiding device 5 and an impact drive device 4; the guiding device 5 comprises an impact guiding element 5.1; the impact drive device comprises a cam impact drive device; the cam impact drive device comprises a cam 30 and a power impact element 4.1; the cam 30 and the power impact element 4.1 are matched to drive the power impact element 4.1 to impact; a bearing 35 is provided between the cam 30 and the power impact element 4.1; the bearing 35 has rolling friction with the power impact element 4.1; the power impact element 4.1 and the impact guiding element 5.1 are separated, connected, or integrated;
the remaining is the same as the embodiment 1.

Embodiment 85

[0280] As shown in Fig. 149 and Fig. 150, the reciprocating impact part comprises a guiding device 5 and an impact drive device 4; the guiding device 5 comprises an impact guiding element 5.1; the impact drive device 4 comprises a crank impact drive device; the crank impact drive device comprises an eccentric shaft 22.1.3 and a power impact element 4.1; the eccentric shaft 22.1.3 and the power impact element 4.1 are matched to drive the power impact element 4.1 to impact; a bearing 35 is provided between the eccentric shaft 22.1.3 and the power impact element 4.1; the bearing 35 has rolling friction with the power impact element; the power impact element 4.1 and the impact guiding element 5.1 are separated, connected, or integrated;
the remaining is the same as the embodiment 1.

Embodiment 86

[0281] As shown in Fig. 151 and Fig. 152, the reciprocating impact part comprises a guiding device 5 and an impact drive device 4; the guiding device 5 comprises an impact guiding element 5.1; the impact drive device 4 comprises a crank impact drive device; the crank impact drive device comprises a crank 31 and a power impact element 4.1; the crank 31 and the power impact element 4.1 are matched to drive the power impact element 4.1 to impact; a bearing 35 is provided between the crank 31 and the power impact element 4.1; the bearing 35 has rolling friction with the power impact element 4.1; the power impact element 4.1 and the impact guiding element 5.1 are separated, connected, or integrated;
the remaining is the same as the embodiment 1.

Embodiment 87

[0282] As shown in Fig. 153 to Fig. 155, a wear-resistant impact mining machine comprises a supporting box 13, a guiding device 5, an impact drive device 4 and an impact head 6 etc.; the supporting box 13 comprises the guiding device 5; the guiding device comprises an impact guiding element 5.1, rubbing body 38 and a rubbing body support 39 etc.; the rubbing body 38 comprise rollers 5.4 etc.; the rollers 5.4 comprise guiding rollers 5.3 etc.; a guiding support 5.2 comprises a guiding roller support etc.; the supporting box 13 and the rubbing body support 39 are separated, or connected in a separated manner or integrated; an end of the impact guiding element 5.1 extending out of the supporting box 13 is connected with an impact head 6 or two ends of the impact guiding element 5.1 are provided with impact heads 6; the impact guiding element 5.1 is connected or integrated with an impact head 6; the impact drive device 4 comprises a crank impact drive device 4.2; the crank impact drive device 4.2 comprises a power impact element 4.1 and a power support 4.3 etc.; the supporting box 13 and the power support 4.3 are connected in a separated manner or integrated; the power support 4.3 and the guiding support 5.2 are separated or connected in a separated manner or integrated; the impact guiding element 5.1 and the power impact element 4.1 are separated, connected in a separated manner or integrated; the power impact element 4.1 is provided in the supporting box 13; the power impact element 4.1 and the impact head 6 are moveably connected or separated; a damage-prevention mechanism 17 is provided on one end of the power impact element 4.1; the damage-prevention mechanism 17 comprises a rotating structure etc.; the power impact element 4.1 drives the impact head 6 to impact; an impact damage

force is applied on the damage-prevention mechanism 17; the rotating structure of the damage-prevention mechanism 17 is stressed to rotate to isolate an impact reactive force; the rubbing body 38 are provided between the guiding support 5.2 and the impact guiding element 5.1 to form the guiding device 5; the rubbing body 38, the rubbing body support 39 and the impact guiding element 5.1 etc. are matched closely to support an impact of the impact head 6 through rolling friction or suspension friction; the guiding device 5 centralizes an impact direction of the impact head 6, thus preventing the impact drive device 4 from being damaged by the damage force and the impact reactive force;

the crank impact drive device 4.2 comprises a multi-throw crank 22.1 multi-rod impact mechanism and a power output component etc.; the multi-throw crank 22.1 multi-rod impact mechanism comprises a multi-throw crank 22.1 and a connecting rod 22.2 etc.; the multi-throw crank 22.1 comprises a power concentric shaft section 22.1.1, connecting handles 22.1.2 and eccentric shafts 22.1.3 etc.; the power concentric shaft section 22.1.1, the connecting handles 22.1.2 and the eccentric shafts 22.1.3 etc. are separated, connected or integrated; one end of the power concentric shaft section 22.1.1 of the multi-throw crank 22.1 is connected with the power output component of the crank impact drive device 4.2; the other end of the power concentric shaft section 22.1.1 is provided with two or more connecting handles 22.1.2 and eccentric shafts 22.1.3 etc.; the power concentric shaft section 22.1.1 of the multi-throw crank 22.1 is installed on the supporting box 13 or the supporting frame 8; an eccentric shaft 22.1.3 of the multi-throw crank 22.1 is hinged with one end of the connecting rod 22.2 and the other end of the connecting rod 22.2 is connected or separated with the impact head 6; one eccentric shaft 22.1.3 drives one or more connecting rods 22.2 to impact in a reciprocating manner;

the eccentric shafts 22.1.3 are one or two or more eccentric shafts 22.1.3; two or more eccentric shafts 22.1.3 are arranged radially at intervals along the power concentric shaft section 22.1.1 to form angular difference;

the impact drive device 4 comprises a power output component; the power concentric shaft section 22.1.1 of the multi-throw crank 22.1 and the power output component are separated, connected or integrated;

the multi-throw crank 22.1 is provided with a liquid channel 37; the liquid channel 37 is provided on the power concentric shaft section 22.1.1, the connecting handle 22.1.2 and/or the eccentric shafts 22.1.3;

the supporting box 13 comprises a lubricating system;

the supporting box 13 comprises a sealing element 14;

the sealing element 14 is provided on a moveable junction of the impact drive device 4 or the guiding device 5 and the supporting box 13;

the junction of the power impact element 4.1 and the impact head 6 is provided with an impact element hood 15; or the junction of the impact guiding element 5.1 and the impact head 6 is provided with a guiding element hood 3615; the power impact element 4.1 and the impact head 6 are connected or separated; the impact guiding element 5.1 and the impact head 6 are connected or integrated; a sealing element 14 is provided between the impact element hood 15 or the guiding element hood 3615 and the supporting box 13;

a sealing element 14 is provided between the impact guiding element 5.1 and the rubbing body support 39 or is provided between the power impact element 4.1 and the power support 4.3;

the sealing element 14 comprises a sealing cavity, a sealing fin, a sealing plug, a sealing ring or a sealing gasket etc.;

the sealing element 14 is made of a rubber material, a polyurethane material, a nylon material, a plastic material, a metal material or a mixed material etc.;

the impact element hood 15 is provided at the junction of the power impact element 4.1 and the impact head 6, or the guiding element hood 3615 is provided at the junction of the impact guiding element 5.1 and the impact head 6; the power impact element 4.1 and the impact head 6 are connected, separated or integrated; the impact guiding element 5.1 and the impact head 6 are connected or integrated;

the impact head 6 comprises impact external layer material teeth 6.5 and impact internal layer material teeth 6.2 etc.; the impact external layer material teeth 6.5 are shaped and arranged so that a material fallen by the impact internal layer material teeth 6.2 can flow out from gaps between the impact external layer material teeth 6.5;

the impact internal layer material teeth 6.2 are shaped or arranged so as to fall an internal layer material of a coal wall or a rock wall to be mined;

the impact external layer material teeth 6.5 and impact internal layer material teeth 6.2 are arranged in parallel to form a multi-layer impact head 6; multiple layers of impact mechanisms are matched with each other to impact, fall and discharge a material; the mining width and mining efficiency are improved by multi-layer impact teeth;

the distances between the tooth heads of impact teeth of two adjacent layers are different; the impact teeth are provided as multi-layer impact teeth to impact a coal wall or a rock wall to be mined into steps; two or more opposite free surfaces are formed on each step layer of the step-shaped coal wall or rock wall; the pressure stress and structural strength of the step-shaped coal wall or rock wall are greatly reduced compared with the original planar coal wall or rock wall; the tooth heads are connected in a separated manner or integrated with the impact teeth; the two opposite free surfaces of the step-shaped coal wall or rock wall are applied to impacting and falling a material when the impact teeth of each layer perform mining again, thus greatly reducing an impact resistance, avoiding lumps of the material fallen by the impact head 6, reducing power consumption, reducing an impact reactive force and improving working efficiency;

an impact external layer material tooth 6.5 frame 6.4 is provided with a discharge hole 6.8;
the discharge hole 6.8 enables a material fallen by the impact internal layer tooth material 6.2 to flow out;
a machine body 1 comprises a frame etc.; the machine body 1 thereon is not provided with a jacking device 9; a reciprocating impact part 3 is provided on the frame; a travelling part 2 is provided at a lower part of the machine body 1 and drives the machine body 1 to travel;
the rubbing body 38 may also comprise suspenders etc.; the rollers 5.4 may also comprise power rollers 4.8 etc.; the impact guiding element 5.1 may be also provided with an impact head 6 on one end or provided with an impact head 6 on one end and a counterweight element on the other end;
the impact drive 4 device may also comprise a hydraulic impact drive device or a pneumatic impact drive device or a solid flowing impact drive device etc.;
damage-prevention mechanisms 17 may be also provided on two ends of the power impact element 4.1; the damage-prevention mechanisms 17 may comprise split structures etc.;
the remaining is the same as the embodiment 1.

Embodiment 88

[0283] As shown in Fig. 156, a wear-resistant impact mining machine comprises a supporting box 13, a guiding device 5, an impact drive device 4 and an impact head 6 etc.; the supporting box 13 comprises the guiding device 5; the guiding device comprises an impact guiding element 5.1, rubbing body 38 and a rubbing body support 39 etc.; the rubbing body 38 comprise rollers 5.4 etc.; the rollers 5.4 comprise linear bearings etc.; the supporting box 13 and the rubbing body support 39 are separated, or connected in a separated manner or integrated; an end of the impact guiding element 5.1 extending out of the supporting box 13 is connected with an impact head 6 or two ends of the impact guiding element 5.1 are provided with impact heads 6; the impact guiding element 5.1 is connected or integrated with an impact head 6; the impact drive device 4 comprises a crank impact drive device 4.2; the crank impact drive device 4.2 comprises a power impact element 4.1 and a power support 4.3 etc.; the supporting box 13 and the power support 4.3 are connected in a separated manner or integrated; the power support 4.3 and the guiding support 5.2 are separated or connected in a separated manner or integrated; the impact guiding element 5.1 and the power impact element 4.1 are separated, connected in a separated manner or integrated; the power impact element 4.1 is provided in the supporting box 13; the power impact element 4.1 and the impact head 6 are moveably connected or separated; the rubbing body 38 are provided between the guiding support 5.2 and the impact guiding element 5.1 to form the guiding device 5; the rubbing body 38, the rubbing body support 39 and the impact guiding element 5.1 etc. are matched closely to support an impact of the impact head 6 through rolling friction or suspension friction; the guiding device 5 centralizes an impact direction of the impact head 6, thus preventing the impact drive device 4 from being damaged by the damage force and the impact reactive force;
the remaining is the same as the embodiment 87.

Embodiment 89

[0284] As shown in Fig. 157 to Fig. 159, a jacking device 9 comprises a rocker arm lifting mechanism; a front part of the rocker arm lifting mechanism is provided with a supporting box 13; a crank impact drive device 4.2 comprises a transmission gear 44; two sides of the transmission gear 44 are provided with crank connecting rods 22.2; a crank connecting rod 22.2 at one side at least drives one impact head 6 to impact; the crank connecting rods 22.2 at two sides of the transmission gear 44 impact simultaneously or impact alternatively; two or more ends of the supporting box 13 are provided with a guiding support 5.2, an impact guiding element 5.1 and rubbing body 38; the rubbing body 38 are provided between the guiding support 5.2 and the impact guiding element 5.1 to form a multi-point support impact head 6 structure; the supporting box 13 and the guiding support 5.2 are connected in a separated manner or integrated; two or more impact guiding elements 5.1 extend out of the box to connect the impact head 6; a connecting rod 22.2 is connected, separated or integrated with the impact head 6; a damage-prevention mechanism 17 is provided at one end or two ends of the connecting rod 22.2; the connecting rod 22.2 drives the impact head 6 to reciprocate; two or more impact guiding elements 5.1 centralize an impact direction of the impact head 6;
the remaining is the same as the embodiment 87.

Embodiment 90

[0285] As shown in Fig. 160, a liquid suspender 40 comprises a liquid medium source 40.1, a control valve 40.2, a transmission pipeline 40.3 and a liquid cavity 40.4 etc.; the liquid cavity 40.4 is provided on a guiding device 5; the liquid suspender 40 is formed between a guiding support 5.2 and an impact guiding element 5.1 and the liquid suspender 40 supports the impact guiding element 5.1 to reciprocate with suspension friction;
the liquid cavity 40.4 may be also provided on an impact drive device 4; the liquid suspender 40 is formed between a power support 4.3 and a power impact element 4.1;
the remaining is the same as the embodiment 87.

Embodiment 91

[0286] As shown in Fig. 161, a gas suspender 41 comprises a gas source 41.1, a control valve 40.2, a transmission pipeline 40.3, and a gas cavity 41.2 etc.; the gas cavity 41.2 is provided on a guiding device 5 or an impact drive device 4; the gas suspender 41 is formed between

a rubbing body support 39 and an impact guiding element 5.1; or the gas suspender 41 is formed between a power support 4.3 and a power impact element 41; the power support 4.3 and the rubbing body support 39 are separated, connected in a separated manner or integrated; the impact guiding element 5.1 and a power impact element 4.1 are separated, connected in a separated manner or integrated; the gas suspender 41 supports the impact guiding element 5.1 to reciprocate with suspension friction or the gas suspender 41 supports the power impact element 4.1 to reciprocate with suspension friction; the remaining is the same as the embodiment 2.

Embodiment 92

[0287] As shown in Fig. 162, an impact guiding element 5.1 and a rubbing body support 39 comprise an N pole permanent magnet 42.1; a power impact element 4.1 and a power support 4.3 comprise an S pole permanent magnet 42.2; N pole permanent magnets 42.1 repel each other or S pole permanent magnets 42.2 repel each other to form a magnetic suspender 42; the power impact element 4.1 drives the impact guiding element 5.1 to reciprocate; the magnetic suspender 42 supports the impact guiding element 5.1 and the rubbing body support 39 to reciprocate oppositely with suspension friction; or the magnetic suspender 42 supports the power impact element 5.1 and the power support 4.3 to reciprocate oppositely with suspension friction;
the power impact element 4.1 and the power support 4.3 may also comprise an N pole permanent magnet 42.1;
the impact guiding element 5.1 and the rubbing body support 39 may also comprise an S pole permanent magnet 42.2;
the remaining is the same as the embodiment 87.

Embodiment 93

[0288] As shown in Fig. 163, an impact guiding element 5.1 and a rubbing body support 39 or a power impact element 4.1 and a power support 4.3 comprise a cathode electromagnet 42.3; or the impact guiding element 5.1 and the rubbing body support 39 or the power impact element 4.1 and the power support 4.3 comprise an anode electromagnet 42.4; cathode electromagnets 42.3 repel each other or anode electromagnets 42.4 repel each other to form a magnetic suspender 42; the power impact element 4.1 drives the impact guiding element 5.1 to reciprocate; the magnetic suspender 42 supports the impact guiding element 5.1 and the rubbing body support 39 to reciprocate oppositely with suspension friction; or the magnetic suspender 42 supports the power impact element 4.1 and the power support 4.3 to reciprocate oppositely with suspension friction;
the remaining is the same as the embodiment 87.

Embodiment 94

[0289] As shown in Fig. 164, a circulating raceway 45 comprises an annular circulating raceway 45.1; an annular plane of the annular circulating raceway 45.1 is arranged along a reciprocating direction; the annular circulating raceway 45.1 is arranged on a guiding support 5.2; the annular circulating raceway 45.1 is arranged peripherally; rollers 5.4 roll in the annular circulating raceway 45.1, thus preventing sliding friction between the rollers 5.4 and the guiding support 5.2;
the annular circulating raceway 45.1 may be also arranged on a power impact element or arranged on an impact guiding element or arranged on a cylinder or arranged on a power roller support; the annular circulating raceway 45.1 is arranged peripherally; the rollers 5.4 roll in the annular circulating raceway 45.1, thus preventing sliding friction between the rollers 5.4 and the guiding support 5.2 or the impact guiding element 5.1 or the cylinder or the power roller support;
the annular circulating raceway 45.1 is arranged individually or symmetrically.

Embodiment 95

[0290] As shown in Fig. 165 to Fig. 167, a spiral circulating raceway 45.2 is provided on a piston 4.5; rollers 5.4 roll along the spiral circulating raceway 45.2; the rollers 5.4 bear the position circulating change of a pressure between the piston 4.5 and a cylinder 4.4, thus reducing the probability that the rollers 5.4 bear a overlarge pressure and is damaged because the rollers 5.4 always partially roll on the piston 4.5 or the cylinder 4.4;
the circulating raceway 45 may be also a wave-shaped circulating raceway;
a wear-resistant material or a high strength material may be provided on a piston rod pressure-bearing section or a guiding roller support pressure-bearing section or a cylinder pressure-bearing section or a piston pressure-bearing section or a roller pressure-bearing part.

Embodiment 96

[0291] As shown in Fig. 168 and Fig. 169, a circulating raceway 45 is provided on an impact guiding element 5.1; the circulating raceway 45 comprises a circulating supporting section 45.3 and a circulating section 45.4; a plane of the circulating raceway 45 is arranged approximately in parallel with the surface of a guiding roller support 5.2; rollers 5.4 the circulating supporting section 45.3 support rolling friction of the guiding support 5.2 while rollers 5.4 in the circulating section 45.4 do not support rolling friction of the guiding support 5.2;
the rollers 5.4 in the circulating supporting section 45.3 support rolling friction of the impact guiding element 5.1 and the guiding support 5.2 or support rolling friction of a power impact element 4.1 and a power support 4.3 while the rollers 5.4 in the circulating section 45.4 do not

support rolling friction of the guiding support 5.2, the impact guiding element 5.1, the power impact element 4.1 and the power support 4.3.

Embodiment 97

[0292] As shown in Fig. 170, a retainer 16.3 is provided in a circulating raceway 45; power rollers 4.8 are provided in the retainer 16.3 and the circulating raceway 45; the thickness of the retainer 16.3 is smaller than the power roller 4.8 diameter; two parts of the power rollers 4.8 higher than the retainer 16.3 are respectively provided in the circulating raceway 45 and a piston 4.5 or a cylinder 4.4, thus preventing reverse friction between the power rollers 4.8 and the power rollers 4.8;
the cylinder 4.4 and the piston 4.5 may be a lightweight material; the lightweight material comprises an aluminum alloy, high strength plastic, ceramics, a titanium alloy, carbon fiber, light steel or a composite material etc.

Embodiment 98

[0293] As shown in Fig. 171, a circulating raceway 45 comprises a pressure-bearing circulating raceway 45.5 and a pressure-free circulating raceway 45.6; the pressure-free circulating raceway 45.6 is connected with a piston 4.5; the pressure-free circulating raceway 45.6 may be detachable, thus facilitating observation and replacement of rollers 5.4;
the pressure-free circulating raceway 45.6 and the piston 4.5 may be also separated or integrated; the pressure-free circulating raceway may be also connected or separated or integrated with an impact guiding element, a rubbing body support or a cylinder.

Embodiment 99

[0294] As shown in Fig. 172, a piston 4.5, rubbing body 38, a cylinder 4.4 and a sealing element 14 etc. are included; the piston 4.5 comprises a circulating raceway 45; the sealing element 14 is provided between front and back circulating raceways 45; the sealing element 14 does not reciprocate on the rubbing body 38, thus preventing a liquid, or a gas or a solid from entering from one side of the piston into the other side;
the sealing element 14 may be also located on one side or two sides of a circulating raceway 45;
the sealing element 14 comprises an O-shaped ring or a sliding ring or an elastic body or a retainer ring or a supporting ring or a sealing ring or a star-shaped ring or a press ring or a V-shaped body or a U-shaped body or a frame-shaped ring or a groove-shaped element or a press spring or an open sealing ring etc.;
the sealing element 14 may be also made of a rubber material, a polyurethane material, a nylon material, a plastic material, a metal material or a mixed material etc.

Embodiment 100

[0295] As shown in Fig. 173, a hydraulic impact drive device or a pneumatic impact drive device 4 or a solid flowing impact drive device comprises a power impact element 4.1, a cylinder 4.4 and a control element 4.6; the power impact element 4.1 comprises a piston 4.5, and a cylinder rod 4.9; the piston 4.5 is provided in the cylinder 4.4; the cylinder rod 4.9 is provided inside the cylinder 4.4 or outside the cylinder 4.4; the cylinder rod 4.9 is the power impact element 4.1 and an impact guiding element 5.1; the piston 4.5 and the cylinder rod 4.9 are separated, connected in a separated manner or integrated; a guiding roller support 5.2 is provided; the guiding roller support 5.2 and the cylinder 4.4 are separated, connected in a separated manner or integrated; the guiding roller support 5.2 is provided inside the cylinder 4.4 or outside the cylinder 4.4; the guiding rollers 5.3 are provided between the guiding roller support 5.2 and the cylinder 4.9; the guiding rollers 5.3, the cylinder rod 4.9 and the guiding roller support 5.2 are matched closely to form a centralizer; the control element 4.6 controls a liquid, a gas or a solid to flow; the piston 4.5 moves under a pressure of the liquid, the gas or the solid; the piston 4.5 drives the cylinder rod 4.9 to reciprocate; the guiding rollers 5.3 rotate against the guiding roller support 5.2 and the cylinder rod 4.9; a moving direction of the cylinder rod 4.9 is controlled by rolling friction.

Embodiment 101

[0296] As shown in Fig. 174, a rubbing body support 39 is integrated with a guiding support 5.2, an impact guiding element 5.1, a cylinder, a piston, a power support 4.3, or a power impact element 4.1, thus reducing a space occupied by the rubbing body support 39; the rubbing body support 39 is integrated with the guiding support 5.2, the impact guiding element 5.1, the cylinder 4.4, the piston 4.5, the power support 4.3 or the power impact element 4.1 to realize high structural strength and high space utilization; a limited space is used for increasing the volumes of rubbing body 38, thus improving the bearing capacity of the rubbing body 38, increasing the contact area of the rubbing body 38 with the guiding support 5.2, the impact guiding element 5.1, the cylinder 4.4, the piston 4.5, the power support 4.3 or the power impact element 4.1, and avoiding an overlarge partial pressure and overlarge damage to the guiding support 5.2, the impact guiding element 5.1, the cylinder, the piston, the power support 4.3 or the power impact element 4.1 due to undersize rubbing body 38.

Embodiment 102

[0297] As shown in Fig. 175 and Fig. 176, a machine body 1, a travelling part 2 and a reciprocating impact part 3 are included; the reciprocating impact part 3 comprises a guiding device 5, an impact drive device 4 and an impact

head 6; the guiding device 5 and the impact drive device 4 are separated, or connected in a separated manner or integrated; the impact drive device 4 comprises a power support 4.3; the guiding device 5 comprises a guiding support 5.2; the power support 4.3 and the guiding support 5.2 are separated, connected in a separated manner or integrated; the power support 4.3 and/or the guiding support 5.2 comprise/comprises a rubbing body support 39; the rubbing body support 39 and the power support 4.3 or the rubbing body support 39 and the guiding support 5.2 are separated, connected in a separated manner or integrated; the rubbing body support 39 comprises a roller support or a suspender support; the roller support and the suspender support are separated or connected in a separated manner or integrated; the roller support comprises a guiding roller support and/or a power roller support; the guiding roller support and the power roller support are separated, connected in a separated manner or integrated; the suspender support comprises a guiding suspender support and/or a power suspender support; the suspender support and the power suspender support are separated, connected in a separated manner or integrated; the guiding device 5 comprises an impact guiding element 5.1, rubbing body 38 and a rubbing body support 39; the rubbing body 38 comprise rollers 5.4 and suspenders; the rollers 5.4 comprise guiding rollers 5.3 and/or power rollers 4.8; the guiding rollers 5.3 and the power rollers 4.8 are separated, connected in a separated manner or integrated; the suspenders comprise guiding suspenders and/or power suspenders; the guiding suspenders and the power suspenders are separated, connected in a separated manner or integrated;
the impact drive device 4 comprises a power impact element 4.1 and a power support 4.3; the impact guiding element 5.1 and the power impact element 4.1 are separated, connected in a separated manner or integrated; the impact guiding element 5.1 and the impact head 6 are connected in a separated manner or integrated; the power impact element 4.1 and the impact head 6 are moveably connected, or separated or integrated; the rubbing body 38 are provided between the guiding support 5.2 and the impact guiding element 5.1 or are provided between the power support 4.3 and the power impact element 4.1; the guiding support 5.2 or the power support 4.3 comprises a rubbing body support 39; the power impact element 4.1 drives the impact guiding element 5.1 or the impact head 6 to reciprocate; the rubbing body 38, the rubbing body support 39 and the impact guiding element 5.1 are matched closely to support the impact head 6 to impact through rolling friction or suspension friction;
the machine body 1 comprises a frame; the frame thereon is provided a jacking device 9 or is not provided with a jacking device 9; the reciprocating impact part 3 is provided on the frame or is provided on the jacking device 9; the frame is provided on the machine body 1 or the frame is combined with the jacking device 9 in the machine body 1;
the machine body 1 supports the impact head 6 to impact in a reciprocating manner to fall a material;
the travelling part 2 is provided at a lower part of the machine body 1; the travelling part 2 drives the machine body 1 to travel.

Embodiment 103

[0298] As shown in Fig. 177 to Fig. 178, a piston 4.5 comprises a guiding part etc.; rubbing body 38 are rolling wheels; the rolling wheels are provided on the guiding part of the piston 4.5; the guiding part is a square structure, thus reducing the material and volume of the piston 4.5, reducing the weight of the piston 4.5 and reducing energy consumption of reciprocating;
the guiding part may be also a rhombic structure or a V-shaped structure or a plate structure or a rib plate structure or an oval structure or an arc-shaped structure or a rod structure or a cross structure or a polygonal structure or an irregular structure etc.;
the remaining is the same as the embodiment 102.

Claims

1. A rolling friction or suspension friction impact mining method, wherein the method is implemented by the following steps:

   an impact drive device, a guiding device and an impact head are provided; the impact drive device, the guiding device and the impact head are formed into a reciprocating impact part; a power support is provided on the impact drive device; a guiding support is provided on the guiding device; the power support and the guiding support are separated, connected in a separated manner or integrated; a rubbing body support is provided on the power support and/or the guiding support; the rubbing body support and the power support are separated, or connected in a separated manner or integrated, or the rubbing body support and the guiding support are separated, or connected in a separated manner or integrated; a roller support or a suspender support is provided on the rubbing body support; the roller support and the suspender support are separated, connected in a separated manner or separated; a guiding roller support and/or a power roller support are/is provided on the roller support; the guiding roller support and the power roller support are separated, connected in a separated manner or integrated; a guiding suspender support and/or a power suspender support are/is provided on the suspender support; the guiding suspender support and the power suspender support are separated, connected in a separated manner or integrated; an impact guid-

ing element, a rubbing body and the rubbing body support are provided on the guiding device; the rubbing body is provided as a roller or a suspender; the roller is provided as a guiding roller and/or a power roller; the guiding roller and the power roller are separated, connected in a separated manner or integrated; the suspender is provided as a guiding suspender and/or a power suspender; the guiding suspender and the power suspender are separated, connected in a separated manner or integrated;

the impact drive device is provided as a crank impact drive device, or a hydraulic impact drive device or a pneumatic impact drive device or a solid flowing impact drive device; a power impact element and the power support is provided on the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device; a cylinder is provided on the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device; the cylinder and the power support or the guiding support are separated, connected in a separated manner or integrated; the impact guiding element and the power impact element are separated, connected in a separated manner or integrated;

the impact guiding element and the impact head are connected in a separated manner or integrated; the power impact element and the impact head are connected moveably, connected separately or integrated; the rubbing body is provided between the guiding support and the impact guiding element, or between the cylinder and the impact guiding element, or between the power support and the power impact element; the rubbing body support is provided on the guiding support, or the cylinder or the power support; the power impact element drives the impact guiding element or the impact head to reciprocate; the rubbing body, the rubbing body support and the impact guiding element are matched closely to support an impact of the impact head through rolling friction or suspension friction;

a frame is provided; the frame thereon is provided or is not provided with a jacking device; the reciprocating impact part is provided on the frame or provided on the jacking device; the frame is provided in a machine body or the frame and the jacking device are combined and provided in the machine body;

the machine body supports the impact head to impact in a reciprocating manner to fall a material;

a travelling part is provided; the travelling part is provided at a lower portion of the machine body; the travelling part drives the machine body to travel.

2. A rolling friction or suspension friction impact mining method according to claim 1, wherein
the rubbing body, the rubbing body support and the impact guiding element are matched closely to support an impact of the impact head through rolling friction or suspension friction and centralize an impact direction of the impact head; the impact drive device is protected by the guiding device from being damaged by damage, thus improving impact efficiency.

3. A rolling friction or suspension friction impact mining method according to claim 1, wherein
one or two ends of the power impact element is provided with a damage-prevention mechanism; the damage-prevention mechanism is provided as a rotating structure or a split structure; the rotating structure or the split structure of the damage-prevention mechanism is used in a matched manner with the guiding device; the rotating structure is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner.

4. A rolling friction or suspension friction impact mining method according to claim 1, wherein
the guiding support is provided on two or more ends of the power support to form two or more guiding support points; the two or more ends are two or more ends of a guiding support main body or two or more end spatial positions out of the guiding support main body; the two or more guiding support points both support the gravity of the impact head; the rubbing body, the impact guiding element and the rubbing body support are matched closely to form a multi-point support impact head structure; the multi-point support impact head structure supports the impact head through multiple points to centralize an impact direction of the impact head, thus maximally increasing a centralizing width to the impact head, strengthening centralizing on the impact head, maximally controlling the impact direction of the impact head, preventing the impact drive device from being damaged by an impact damage force and a reactive force, and extending the service life of the device.

5. A rolling friction or suspension friction impact mining method according to claim 1, wherein two or more rows of rubbing bodies are provided around one impact guiding element; two or more rows of rubbing bodies bear a gravitational load of the impact head and/or the impact guiding element; at least one or more rubbing bodies of one row of rubbing bodies support the impact head to impact in a reciprocating manner, thus preventing centralized damage on the rubbing bodies caused by a gravitational load of the impact head and/or the impact guiding element on

only one row of rubbing bodies.

6. A rolling friction or suspension friction impact mining method according to claim 1, wherein
the impact guiding element is provided on the rubbing body support; a liquid suspender or a gas suspender is provided on the impact guiding element or the rubbing body support; or a liquid suspender or a gas suspender is provided on the power impact element or the power support, or a magnetic suspender is provided on the impact guiding element or the rubbing body support, or a magnetic suspender is provided on the power impact element and the power support; the magnetic suspender is provided as an electromagnetic or a permanent magnetic suspender; suspension friction is formed between the impact guiding element and the rubbing body support or between the power impact element and the power support by a suspender; a frictional resistance and frictional damage between the impact guiding element and the rubbing body support or between the power impact element and the power support are reduced by the suspension friction, thus improving the service life of the impact drive device or the guiding device.

7. A rolling friction or suspension friction impact mining method according to claim 6, wherein
an N pole permanent magnet is provided on the impact guiding element or the guiding support; or an S pole permanent magnet is provided on the impact guiding element or the guiding support; N pole permanent magnets repel each other and S pole permanent magnets repel each other to form a magnetic suspender; the power impact element drives the impact guiding element to reciprocate; the magnetic suspender supports the impact guiding element and the guiding support to reciprocate oppositely with suspension friction; or an N pole permanent magnet is provided on the power impact element and the power support; or an S pole permanent magnet is provided on the power impact element and the power support; an N pole permanent magnet and an N pole permanent repel each other and an S pole permanent magnet and an S pole permanent magnet repel each other to form a magnetic suspender; the magnetic suspender supports the power impact element and the power support to reciprocate oppositely with suspension friction.

8. A rolling friction or suspension friction impact mining method according to claim 6, wherein
a cathode electromagnet is provided on the impact guiding element and the guiding support, or an anode electromagnetic is provided on the impact guiding element and the guiding support; cathode electromagnets repel each other and anode electromagnets repel each other to form a magnetic suspender; the power impact element drives the impact guiding element to reciprocate; the magnetic suspender supports the impact guiding element and the guiding support to reciprocate oppositely with suspension friction; or a cathode electromagnet is provided on the power impact element and the power support; or an anode electromagnet is provided on the power impact element and the power support; cathode electromagnets repel each other and anode electromagnets repel each other to form a magnetic suspender; the magnetic suspender supports the power impact element and the power support to reciprocate oppositely with suspension friction.

9. A rolling friction or suspension friction impact mining method according to claim 6, wherein
a gas source, a control valve, a transmission pipeline and a gas cavity are provided; the gas cavity is provided on the guiding device; a gas suspender is formed between the guiding support and the impact guiding element; the gas suspender supports the impact guiding element to reciprocate with suspension friction; or the gas cavity is provided on the impact drive device; a gas suspender is formed between the power support and the power impact element; the gas suspender supports the power impact element to reciprocate with suspension friction.

10. A rolling friction or suspension friction impact mining method according to claim 6, wherein
a liquid medium source, a control valve, a transmission pipeline and a liquid cavity are provided; the liquid cavity is provided on the guiding device; a liquid suspender is formed between the guiding support and the impact guiding element; or the liquid suspender supports the impact guiding element to reciprocate with suspension friction; the liquid cavity is provided on the impact drive device; a liquid suspender is formed between the power support and the power impact element; the liquid suspender supports the power impact element to reciprocate with suspension friction.

11. A rolling friction or suspension friction impact mining method according to claim 1, wherein
a position-limiting structure is provided on the reciprocating impact part; the position-limiting structure is provided as a guiding position-limiting structure or a power position-limiting structure;
the guiding position-limiting structure and the rubbing body support are connected, separated or integrated; or the guiding position-limiting structure and the impact guiding element are connected, separated or integrated; or the guiding position-limiting structure and the guiding rollers are connected, separated or integrated; or the power position-limiting structure and the power support are connected, separated or integrated; or the power position-limiting structure and the power impact element are connect-

ed, separated or integrated; or the power position-limiting structure and the power rollers are connected, separated or integrated;
guiding rubbing body is provided in the guiding position-limiting structure; the guiding rubbing body supports the impact guiding element to reciprocate along the rubbing body support in the guiding position-limiting structure; the guiding position-limiting structure limits a motion space and a position of the guiding rubbing body and/or the guiding support; power rubbing body is provided in the power position-limiting structure; the power rubbing body supports the power impact element to reciprocate along the power support in the power position-limiting structure; the power position-limiting structure limits a motion space and a position of the power rubbing body and/or the power impact element; the rubbing body supports the impact guiding element and/or the power impact element to reciprocate.

12. A rolling friction or suspension friction impact mining method according to claim 1, wherein
a guiding circulating raceway is provided on the impact guiding element or the roller support; the guiding circulating raceway and the impact guiding element or the roller support are connected in a separated manner or integrated; the impact guiding element is provided in the roller support; the guiding roller is provided in the guiding circulating raceway; one part of the guiding roller exposed out of the guiding circulating raceway is in contact with the surface of the roller support or the surface of the impact guiding element; an impact guiding element main body is not in contact with the surface of the roller support; the guiding rollers support the impact guiding element and the roller support to reciprocate oppositely with rolling friction; or a power circulating raceway is provided on the power impact element or the power support; the power circulating raceway and the power impact element or the power support are connected in a separated manner or integrated; the power impact element is provided in the power support; the power rollers are provided in the power circulating raceway; power rollers exposed out of the power circulating raceway are in contact with the surfaces of the power rollers or the surface of the power support; a power impact element main body is not in contact with the surface of the power support; the power rollers support the power impact element and the power support to reciprocate oppositely with rolling friction.

13. A rolling friction or suspension friction impact mining method according to claim 12, wherein
the rollers roll in a circulating manner, in a reciprocating manner or in situ in the circulating raceway to support the impact guiding element and the rubbing body support or to support the power impact element and the power support to reciprocate oppositely.

14. A rolling friction or suspension friction impact mining method according to claim 1, wherein
a reciprocating stroke section is provided on the roller support, the impact guiding element, the power support or the power impact element; the rollers are provided between the roller support and the impact guiding element, or between the power support and the power impact element and are provided in the reciprocating stroke section; the reciprocating stoke section limits a rolling space and the positions of the rollers; the rollers and the impact guiding element have rolling friction with the roller support or the rollers and the power impact element have rolling friction with the power support while moving.

15. A rolling friction or suspension friction impact mining method according to claim 14, wherein
the width of the reciprocating stroke section is not larger than or equal to or close to the width of the rollers in a roller rolling direction; the length of the reciprocating stroke section is equal to or close to the sum of 1/2 of the stroke of the impact guiding element or the power impact element and the roller diameter; the rollers are provided between the roller support and the impact guiding element, or provided between the power support and the power impact element and provided in the reciprocating stroke section; the reciprocating stroke section limits the rolling space and the positions of the rollers; the reciprocating stroke section ensures that the rollers and the impact guiding element have rolling friction with the roller support or the rollers and the power impact element have rolling friction with the power support while moving.

16. A rolling friction or suspension friction impact mining method according to claim 1, wherein
the rubbing body support and the impact guiding element are provided on the guiding device; two ends of the impact guiding element are provided with impact heads or one end is provided with an impact head, or one end is provided with an impact head and the other end is provided with a counterweight element;
a guiding section is provided on the impact guiding element; the guiding section is provided at an impact guiding element with one end provided with an impact head and the other end provided with a counterweight element, or an impact guiding element with two ends provided with impact heads; the setting method is that two ends of the guiding section are equal or substantially equal in weight besides an overlapped section with the impact guiding element; the guiding section is provided in the rubbing body support; the guiding section is matched with the rubbing body support so that the guiding section is always located on the rubbing body support when moving, thus maintaining gravitational equilibrium of

the impact guiding element in a static state or in a moving state;
the rubbing body support, the rubbing body and the impact guiding element are matched closely to support the impact guiding element to reciprocate; the power impact element and the impact guiding element are separated, connected or integrated; the impact head is supported by the impact guiding element to reciprocate; the impact head impacts a coal wall or a rock wall to fall a material.

17. A rolling friction or suspension friction impact mining method according to claim 1, wherein
a rolling wheel is provided between the power support and the power impact element or a rolling wheel is provided between the guiding support and the impact guiding element;
when an axis of the rolling wheel is fixed to the power impact element, the rolling wheel rolls against the power support; or when the axis of the rolling wheel is fixed to the power support, the rolling wheel rolls against the power impact element; or when the axis of the rolling wheel is fixed to the roller support, the rolling wheel rolls against the impact guiding element; or when the axis of the rolling wheel is fixed to the impact guiding element, the rolling wheel rolls against the roller support, thus preventing fitting sliding friction of the power impact element and the power support, or preventing fitting sliding friction of the roller support and the impact guiding element, and reducing wear of the guiding device and/or wear of the impact drive device; the power impact element and the impact guiding element are separated, connected in a separated manner or integrated; the power support and the roller support are separated, connected in a separated manner or integrated.

18. A rolling friction or suspension friction impact mining method according to claim 17, wherein
the surface of the rolling wheel is manufactured into a convex, a recess, a V groove or a curve; the shape of the roller support or the shape of a contact surface between the impact guiding element and the rolling wheel is locked with the shape of the surface of the rolling wheel; or the shape the power support or the shape of a contact surface between the power impact element and the rolling wheel is locked with the shape of the surface of the rolling wheel; the rolling wheel, the roller support and the impact guiding element are matched closely or the rolling wheel, the power support and the power impact element are matched closely to control a motion of the impact guiding element and/or the power impact element to be a straight line reciprocating motion through rolling friction.

19. A rolling friction or suspension friction impact mining method according to claim 1, wherein
when the rubbing body support is provided as an external sleeve, the impact guiding element is provided as an internal body; when the rubbing body support is provided as an internal body, the impact guiding element is provided as an external sleeve; the rubbing body is provided between the external sleeve and the internal body; the external sleeve, the internal body and the rubbing body is matched closely so that the external sleeve or the internal body reciprocates oppositely through rolling friction or suspension friction;
the impact head is supported by the reciprocating external sleeve or internal body to reciprocate with rolling friction or suspension friction.

20. A rolling friction or suspension friction impact mining method according to claim 1, wherein
a raceway guiding device, or a recess guiding device, or a guiding device with a bracket, or a circulating raceway guiding device or a reciprocating stroke section guiding device, or a position-limiting guiding device, or a cylindrical guiding device, or a U-shaped guiding device, or a frame-shaped guiding device, or an irregular guiding device is provided; the rubbing body support, the rubbing body and the impact guiding element are matched closely to enable the impact guiding element to reciprocate through rolling friction or suspension friction; a reactive damage force generated by an impact of the impact head on a coal wall or a rock wall is applied to the guiding device, thus preventing the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device from being damaged by the impact reactive damage force; the guiding device centralizes an impact direction of the impact head and ensures that the next impact of the impact head is applied to an object to be mined; the travelling part drives the machine body to travel to realize reciprocating impact and continuous mining.

21. A rolling friction or suspension friction impact mining method according to claim 1, wherein
the guiding device is combined with a crank component of the crank impact drive device, or the guiding device is combined with the hydraulic impact drive device, or the guiding device is combined with the pneumatic impact drive device and provided in a supporting box; the supporting box and the power support are separated, connected in a separated manner or integrated; the power support comprises a crank support or a cylinder; the supporting box and the guiding support are separated, connected in a separated manner or integrated;
two ends of the impact guiding element provided in the supporting box are provided with impact heads, or one end of the impact guiding element is provided with an impact head and the other end is provided with a counterweight element, or one end of the im-

pact guiding element is provided with an impact head; an end of the power impact element extending out of the support box is connected or integrated with the impact head;
the supporting box supports the power impact element and the impact guiding element to reciprocate, thus protecting components in the box from being polluted and corroded by dust, etchant gases and waste water.

22. A rolling friction or suspension friction impact mining method according to claim 1, wherein
a fixing support and a buffering support are provided on the jacking device, the reciprocating impact part or the frame; or when the fixing support is provided on the jacking device, the buffering support is provided on the reciprocating impact part; or when the fixing support is provided on the frame, the buffering support is provided on the jacking device;
a buffering element and a buffering guiding element are provided; the buffering element is provided between the fixing support and the buffering support, or provided between the jacking device and the frame, or is provided between the jacking device and the reciprocating impact part; the buffering guiding element is separated, connected in a separated manner or integrated with the fixing support or the buffering support or the jacking device or the frame or the reciprocating impact part;
the power impact element drives the impact head or the impact guiding element to impact so that an impact reactive force is applied on the buffering support and the fixing support, or is applied on the jacking device and the frame, or is applied on the jacking device and the reciprocating impact part; the buffering element is damaged to absorb the impact reactive force; the buffering guiding element controls a buffering direction so that buffering is reciprocating straight line buffering, thus preventing the impact head from oscillating non-directionally during buffering.

23. A rolling friction or suspension friction impact mining method according to claim 22, wherein
when the fixing support is provided as a buffering guiding element, the buffering support is provided as a buffering guiding sleeve; or when the buffering support is provided as a buffering guiding element, the fixing support is provided as a buffering guiding sleeve;
the buffering guiding element is locked glidingly with the buffering guiding sleeve; when a guiding lug boss or a guiding groove is provided on the buffering guiding element, a guiding groove or a guiding lug boss is correspondingly provided on the buffering guiding sleeve; two sides of a convex portion of the guiding lug boss are provided with buffering elements; the buffering guiding sleeve is locked on the buffering guiding element; the buffering guiding element, the buffering elements and the buffering guiding sleeve are matched to form a bi-directional guiding buffering structure to have a bi-directional buffering function;
the buffering guiding element supports the buffering guiding sleeve to slide in a reciprocating manner in a straight line along the buffering guiding element, or the buffering guiding sleeve supports the buffering guiding element to slide in a reciprocating manner in a straight line along the buffering guiding sleeve to form bi-directional guiding buffering;
the power impact element drives the impact head or the impact guiding element to impact; an impact reactive damage force is applied on a bi-directional guiding buffering mechanism; the bi-directional guiding buffering mechanism absorbs the impact reactive force;
the bi-directional guiding buffering mechanism is provided on the frame, or is provided on the jacking device, or is provided on the reciprocating impact part, or is provided on the jacking device and the frame, or is provided on the jacking device and the reciprocating part;
the power impact element drives the impact head or the impact guiding element to reciprocate; a buffering element at a front portion of the guiding lug boss and a buffering element at a back portion of the guiding lug boss absorbs an impact reactive force of the impact head; the buffering guiding sleeve and the buffering guiding element slide oppositely in a straight line; the buffering guiding element, the buffering guiding sleeve and the buffering elements are matched to absorb the impact reactive force of the impact head and control a buffering direction to be reciprocating straight line buffering, thus preventing the impact drive device and the guiding device from oscillating non-directionally and stabilizing an impact direction of the impact head.

24. A rolling friction or suspension friction impact mining method according to claim 23 or 24, wherein
a retaining structure is provided on the fixing support and the buffering support, or a retaining structure is provided on the buffering guiding element or the buffering guiding sleeve; a retaining element is provided on the retaining structure; the retaining element is separated, or connected in a separated manner or integrated with the fixing support, the buffering support, the buffering guiding element or the buffering guiding sleeve;
the retaining element prevents the fixing support and the buffering support from being detached during reciprocating sliding, or the retaining element prevents the buffering guiding element and the buffering guiding sleeve from being detached during opposite reciprocating sliding.

25. A rolling friction or suspension friction impact mining

method according to claim 1, wherein
a fixing support and a buffering support are provided on the jacking device, the reciprocating impact part or the frame; or when the fixing support is provided on the jacking device, the buffering support is correspondingly provided on the reciprocating impact part; or when the fixing support is provided on the frame, the buffering support is correspondingly provided on the jacking device; or when the fixing support is provided on the frame, the buffering support is correspondingly provided on the reciprocating impact part;
a spline shaft and a spline housing are provided; a sliding reciprocating stroke section is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force to form a sliding stroke spline shaft housing buffering mechanism; or a driving pulley is fixed on the fixing support and the driving pulley is connected with a drive shaft of an electric machine, a hydraulic motor or a pneumatic motor; a driven pulley is provided on the buffering support; a belt is provided on the driving pulley and the driven pulley; the driven pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force to form a belt buffering mechanism; the sliding stroke spline shaft housing buffering mechanism or the belt buffering mechanism forms a rotation power buffering mechanism;
an electric machine or a hydraulic motor or a pneumatic motor of a rotation power source element of the reciprocating impact part is provided on the jacking device, or is provided on the frame, or is provided on the reciprocating impact part, or is provided on the jacking device, or is provided on the jacking device and the frame, or is provided on the reciprocating impact part and the jacking device;
a rotation power buffering mechanism is provided on the rotation power source element and a rotation impact transmission element, or is provided on the rotation impact transmission element or is provided on the jacking device and the reciprocating impact part, or is provided on the jacking device and the frame, or is provided on the fixing support and the buffering support, or is provided on the frame and the reciprocating impact part; the rotation power buffering mechanism prevents the electric machine, the hydraulic motor or the pneumatic motor from being damaged by an impact reactive force;
a buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part; the buffering guiding element is provided on the frame and the reciprocating impact part, or the buffering guiding element is provided on the fixing support and the buffering support, or the buffering guiding element is provided on the jacking device and the reciprocating impact part to form a structural buffering mechanism; the structural buffering mechanism absorbs an impact reactive force through the buffering element while controlling a buffering direction with the buffering guiding element;
the rotation power buffering mechanism and the structural buffering mechanism are used independently or used in combination;
the rotation power buffering mechanism and/or the structural buffering mechanism are/is provided on the frame and the jacking device, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or provided on the frame and the reciprocating impact part; the structural buffering mechanism is matched with the sliding stroke spline shaft housing buffering mechanism and the belt buffering mechanism to absorb and buffer an impact reactive force of the impact head and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame from being damaged by the impact reactive force and ensuring that an impact direction of the impact head faces an object to be mined.

26. A rolling friction or suspension friction impact mining method according to claim 1, wherein
the jacking device is provided as a rocker arm lifting mechanism; the rocker arm lifting mechanism is provided with a rocker arm; the rocker arm is provided as a parallelogram rocker arm or a single rocker arm; the parallelogram rocker arm is provided with a main rocker arm and a secondary rocker arm;
a supporting box or a supporting frame is provided the reciprocating impact part; one end of the main rocker arm is hinged with the machine body and the other end is hinged with the supporting box or the supporting frame; one end of the secondary rocker arm is hinged with the machine body and the other end is hinged with the supporting box or the supporting frame;
the reciprocating impact part is supported by the main rocker arm and/or the secondary rocker arm; the main rocker arm and the secondary rocker arm are matched to adjust a mining direction or position of the impact head, thus ensuring that the next impact of the impact head is applied to an object to be mined.

27. A rolling friction or suspension friction impact mining method according to claim 1, wherein
a power concentric shaft section, connecting handles and eccentric shafts are provided to form a multi-throw crank; the multi-throw crank and connecting rods form a multi-throw crank multi-rod impact head; one end of the power concentric shaft section of the multi-throw crank is connected with a power output

component of the crank impact drive device;
the other end of the power concentric shaft section is provided with two or more connecting handles and eccentric shafts;
the power concentric shaft section of the multi-throw crank is installed on a supporting box or a supporting frame;
an eccentric shaft of the multi-throw crank is hinged with one end of a connecting rod and the other end of the connecting rod is connected, separated or integrated with the connecting rod; one eccentric shaft drives one or more connecting rods to impact in a reciprocating manner to form a multi-throw crank impact drive device, thus improving mining efficiency.

28. A rolling friction or suspension friction impact mining method according to claim 1, wherein
impact external layer material teeth and impact internal layer material teeth are provided; the impact external layer material teeth are shaped and arranged so that a material fallen by the impact internal layer material teeth can flow out from gaps between the impact external layer material teeth;
the impact internal layer material teeth are shaped or arranged so that an internal layer material of a coal wall or a rock wall to be mined can be fallen;
the impact external layer material teeth and impact internal layer material teeth are arranged in parallel to form a multi-layer impact head; multiple layers of mechanisms are matched with each other to fall and discharge a material; the mining width and mining efficiency are improved by multi-layer impact teeth.

29. A rolling friction or suspension friction impact mining method according to claim 1, wherein
impact teeth are provided; tooth heads are provided on the impact teeth; the distances between tooth heads of two adjacent layers of impact teeth are different; the impact teeth are provided as multi-layer impact teeth to impact a coal wall or a rock wall to be mined into steps; two or more opposite free surfaces are formed on each step of the step-shaped coal wall or rock wall; the pressure stress and structural strength of the step-shaped coal wall or rock wall are greatly reduced compared with the original planar coal wall or rock wall; the tooth heads and impact teeth are connected in a separated manner or integrated;
after the coal wall or the rock wall is impacted into steps, a material is fallen by using the two opposite free surfaces of the step-shaped coal wall or rock wall when impact teeth of each layer perform mining again, thus greatly reducing impact resistance, avoiding oversize lumps of the material fallen by the impact head, reducing power consumption, reducing an impact reactive force, and improving impact efficiency.

30. A rolling friction or suspension friction impact mining method according to claim 1, wherein
an impact external layer material tooth frame is provided; the impact external layer material tooth frame is provided with a discharge hole;
impact external layer material teeth are provided on the impact external layer material tooth frame; the impact external layer material teeth are provided on the impact external layer material tooth frame and face a to-be-mined surface; the impact external layer material teeth and the impact external layer material tooth frame are connected in a separated manner or integrated; the impact external layer material teeth are shaped or arranged to fall an external layer material of a layer to be mined;
an impact internal layer material tooth frame and impact internal layer material teeth are provided; the impact internal layer material teeth and the an impact internal layer material tooth frame are connected in a separated manner or integrated etc.; the impact internal layer material teeth are shaped or arranged to fall an internal layer material of the layer to be mined;
the discharge hole enables a material fallen by the impact internal layer material teeth to flow out.

31. A rolling friction or suspension friction impact mining method according to claim 1, wherein
the jacking device is provided as a vertical lifting mechanism; the vertical lifting mechanism is provided with a lifting platform and a lifting platform support; the lifting platform is driven by a rope and rope coiler, a gear and rack, a screw pole, a shaft coupling, a chain wheel and chain, a hydraulic element or a pneumatic element to ascend and descend vertically;
the lifting platform is located and locked by a bolt, a lock tongue, a cushion block, a pull rope, a hydraulic cylinder, or a pneumatic cylinder;
the vertical lifting mechanism drives the reciprocating impact part to move up and down vertically.

32. A rolling friction or suspension friction impact mining method according to claim 1, wherein
the hydraulic impact drive device, the pneumatic impact drive device or the solid flowing impact drive device are provided with a piston, the power rollers, and a cylinder; the power rollers are provided around the piston, or the power rollers are provided at one side of the piston, or the power rollers are provided at two or more sides of the piston; the piston and the power rollers are provided in the cylinder;
supported by the power rollers, the piston and the cylinder reciprocate oppositely with rolling friction to form a rolling piston hydraulic impact drive device or a rolling piston pneumatic impact drive device;
the power impact element is provided as a cylinder rod and a piston; one end of the cylinder rod is con-

nected, separated or integrated with the piston; a control element is provided; the control element controls a liquid, a gas or a solid to flow; the piston is pushed by a flowing pressure of the liquid, the gas or the solid so that the piston and the cylinder reciprocate with rolling friction.

33. A rolling friction or suspension friction impact mining method according to claim 1, wherein the power impact element, a cylinder and a control element are provided; a piston and a cylinder rod are provided on the power impact element; the piston is provided in the cylinder; the cylinder rod is provided inside or outside the cylinder; the piston and the cylinder rod are separated, connected in a separated manner or integrated; the guiding roller support is provided; the guiding roller support and the cylinder are separated, connected in a separated manner or integrated; the guiding roller support is provided inside or outside the cylinder; the guiding roller is provided between the guiding roller support and the cylinder; the guiding rollers, the cylinder rod and the guiding roller support are matched closely to form a centralizer; the control element controls a liquid, a gas or a solid to flow; the piston moves under a pressure of the liquid, the gas or the solid; the piston drives the cylinder rod to reciprocate; the guiding rollers rotate against the guiding roller support and the cylinder rod; a moving direction of the cylinder rod is controlled by rolling friction.

34. A rolling friction or suspension friction impact mining method according to claim 1, wherein the roller support is integrated with the guiding support, the impact guiding element, the cylinder, the piston, the power support, or the power impact element, thus reducing a space occupied by the roller support; the roller support is integrated with the guiding support, the impact guiding element, the cylinder, the piston, the power support or the power impact element to realize high structural strength and high space utilization; a limited space is used for increasing the volumes of the rollers, thus improving the bearing capacity of the rollers, increasing the contact area of the rollers with the guiding support, the impact guiding element, the cylinder, the piston, the power support or the power impact element, and avoiding an overlarge partial pressure and overlarge damage to the guiding support, the impact guiding element, the cylinder, the piston, the power support or the power impact element due to undersize rollers.

35. A rolling friction or suspension friction impact mining method according to claim 3, 11 or 22, wherein the guiding position-limiting structure is provided on the rubbing body support, the rubbing body and/or the impact guiding elements; the rubbing body is provided between the rubbing body support and the impact guiding element and is provided in the guiding position-limiting structure; the guiding position-limiting structure limits a moving space and position of the rubbing body; or the power position-limiting structure is provided on the power support, the rubbing body and/or the power impact element; the rubbing body is provided in the power position-limiting structure; the e power position-limiting structure limits a moving space and position of the rubbing body; one end or two ends of the power impact element are provided with a damage-prevention mechanism; the damage-prevention mechanism is matched with the guiding device; an reactive damage force generated by an impact of the impact head on a coal wall or a rock wall is applied to the damage-prevention mechanism; the damage-prevention mechanism isolates the reactive damage force through rotation or split isolation so that the reactive damage force is applied to the guiding device, thus preventing the impact drive device from being damaged by the impact reactive damage force; the guiding device centralizes an impact direction of the impact head; the buffering element is provided between the frame and the jacking device, or is provided between the jacking device fixing support and the jacking device buffering support, or is provided on the jacking device and the reciprocating impact part or is provided on the frame and the reciprocating impact part; the buffering guiding element is arranged on the frame and the jacking device, or the buffering guiding element is arranged on the jacking device fixing support and the jacking device buffering support, or the buffering guiding element is arranged on the frame and the reciprocating impact part to form a structural buffering mechanism; the structural buffering mechanism buffers an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element.

36. A wear-resistant impact mining machine using the rolling friction or suspension friction impact mining method according to claim 1, wherein comprising a machine body, a travelling part, and a reciprocating impact part; the reciprocating impact part comprises a guiding device, an impact drive device and an impact head; the guiding device and the impact drive device are separated, connected in a separated manner or integrated; the impact drive device comprises a power support; the guiding device comprises a guiding support; the power support and the guiding support are separated, connected in a separated manner or integrated; the power support and/or the guiding support comprise/comprises a rubbing body support; the rubbing body support and the power support or the rubbing body support and the guiding support are separated, connected in a separated manner or integrated; the rubbing body support comprises a roller support or a suspender support; the

roller support and the suspender support are separated, connected in a separated manner or integrated; the roller support comprises a guiding roller support and/or a power roller support; the guiding roller support and the power roller support are separated, connected in a separated manner or integrated; the suspender support comprises a guiding suspender support and/or a power suspender support; the guiding suspender support and the power suspender support are separated, connected in a separated manner or integrated; the guiding device comprises an impact guiding element, a rubbing body and a rubbing body support; the rubbing body comprises a roller or a suspender; the roller comprises a guiding roller and/or a power roller; the guiding roller and the power roller is separated, connected in a separated manner or integrated; the suspender comprises a guiding suspender and/or a power suspender; the guiding suspender and the power suspender are separated, connected in a separated manner or integrated;

the impact drive device comprises a power impact element and a power support; the impact guiding element and the power impact element are separated, connected in a separated manner or integrated; the impact guiding element and the impact head are connected in a separated manner or integrated; the power impact element and the impact head are moveably connected, separated or integrated; the rubbing body is provided between the guiding support and the impact guiding element, or provided between the power support and the power impact element; the guiding support or the power support comprises the rubbing body support; the power impact element drives the impact guiding element or the impact head to reciprocate; the rubbing body, the rubbing body support and the impact guiding element are matched closely to support the impact head to impact through rolling friction or suspension friction; the machine body comprises a frame; the frame thereon is provided or is not provided with a jacking device; the reciprocating impact part is provided on the frame or provided on the jacking device; the frame is provided in the machine body or the frame is provided in the machine body combined with the jacking device;

the machine body supports the impact head to impact in a reciprocating manner to fall a material;

the travelling part is provided at a lower portion of the machine body; the travelling part drives the machine body to travel.

37. A wear-resistant impact mining machine according to claim 36, wherein the rubbing body support, the impact guiding element and the rubbing body are matched closely to support an impact of the impact head through rolling friction or suspension friction and centralize an impact direction of the impact head; the impact drive device is protected by the guiding device from being damaged by damage, thus improving impact efficiency.

38. A wear-resistant impact mining machine according to claim 36, wherein the impact drive device comprises a crank impact drive device, or a hydraulic impact drive device, or a pneumatic impact drive device or a solid flowing impact drive device; the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises the power impact element and the power support; the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises a cylinder; the cylinder is separated, connected in a separated manner or integrated with the power support or the guiding support; the impact guiding element and the power impart element are separated, connected in a separated manner or integrated.

39. A wear-resistant impact mining machine according to claim 36, wherein the impact drive device comprises a crank impact drive device, or a hydraulic impact drive device, or a pneumatic impact drive device or a solid flowing impact drive device; the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises the power impact element and the power support; the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises a cylinder; the cylinder is separated, connected in a separated manner or integrated with the power support or the guiding support.

40. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part further comprises a supporting box; the guiding device and the impact drive device are combined and provided in the supporting box; two ends of the impact guiding element provided in the supporting box are provided with impact heads, or one end of the impact guiding element is provided with an impact head and the other end is provided with a counterweight element for preventing the impact head from damaging the guiding device, the impact drive device and/or the machine body due to gravity unbalance or one end of the impact guiding element is provided with an impact head; an end of the power impact element is connected or separated with the impact head; the power support and the supporting box are separated, integrated or connected; the supporting box protects components in the box from being polluted and corroded by dust, etchant gases and waste water.

41. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part further comprises a supporting frame; the impact drive device or the guiding device is provided on the supporting frame.

42. A wear-resistant impact mining machine according to claim 36, wherein a position-limiting structure is provided on the reciprocating impact part; the position-limiting structure is provided as a guiding position-limiting structure or a power position-limiting structure; the guiding position-limiting structure and the power position-limiting structure are separated, connected in a separated manner or integrated;
the guiding position-limiting structure and the rubbing body support are connected, separated or integrated; or the guiding position-limiting structure and the impact guiding element are connected, separated or integrated; or the guiding position-limiting structure and the guiding rollers are connected, separated or integrated; or the power position-limiting structure and the power support are connected, separated or integrated; or the power position-limiting structure and the power impact element are connected, separated or integrated; or the power position-limiting structure and the power rollers are connected, separated or integrated;
the guiding rollers or the guiding suspenders are provided in the guiding position-limiting structure; the guiding rollers or the guiding suspenders support the impact guiding element to reciprocate along the rubbing body support in the guiding position-limiting structure; the guiding position-limiting structure limits a moving space and position of the guiding rollers, or the guiding suspenders or the impact guiding element; the power rollers or the power suspenders are provided in the power position-limiting structure; the power rollers or the power suspenders support the power impact element to reciprocate along the power support in the power position-limiting structure; the power position-limiting structure limits a moving space and position of the power rollers, the power suspenders and the power impact element; the rubbing body supports the impact guiding element or the power impact element to reciprocate.

43. A wear-resistant impact mining machine according to claim 42, wherein the position-limiting structure comprises a raceway, or a circulating raceway, or a cylindrical channel, or a pit, or a reciprocating stroke section, or a retainer, or a position-limiting plate, or a position-limiting ring, or a position-limiting sleeve, or a position-limiting platform, or a position-limiting rod, or a position-limiting shaft, or a position-limiting groove, or a spherical bump, or a lug boss, or a bearing, or an internal body matched with an external sleeve, or an oval, or a dumbbell, or a circular column, or a zone, or a circular ring, or a rolling wheel, or a platform-shaped column, or a platform-shaped ball, or a platform-shaped drum, or a groove-shaped column, or a groove-shaped ball, or a groove-shaped rolling wheel, or a groove-shaped oval, or a square, or a U shape, or a frame, or an I shape, or a spline, or an arc, or an V shape, or a reversed V shape, or a circular shape, or a plate, or a polygonal, or a cylinder, or a spline housing or a multi-rhombus key.

44. A wear-resistant impact mining machine according to claim 43, wherein the raceway comprises a reciprocating stroke section, or a circulating raceway, or a spiral raceway, or a wave-shaped raceway, or an annular raceway, or a straight line raceway or an irregular raceway.

45. A wear-resistant impact mining machine according to claim 44, wherein the circulating raceway comprises an annular circulating raceway, or a spiral circulating raceway, or a wave-shaped circulating raceway, or an irregular circulating raceway.

46. A wear-resistant impact mining machine according to claim 36, wherein through rolling in a circulating raceway, or rolling in a reciprocating manner, or rolling in situ, or rolling in a pit, or rolling in a raceway, or rolling in a retainer, the rollers supports the impact guiding element and the guiding roller support to reciprocate oppositely.

47. A wear-resistant impact mining machine according to claim 36, wherein a roller or multiple rollers are arranged longitudinally in a reciprocating direction, or a roller or multiple rollers are arranged transversely in a reciprocating direction.

48. A wear-resistant impact mining machine according to claim 36, wherein the guiding roller or the power roller fills a raceway space besides an effective stroke, or fill a raceway space.

49. A wear-resistant impact mining machine according to claim 36, wherein the guiding roller or the power roller is arranged in parallel or in a staggered manner along a reciprocating impact direction.

50. A wear-resistant impact mining machine according to claim 36, wherein the impact drive device comprises the power support and the power impact element; the guiding device comprises the guiding roller, the guiding support and the impact guiding element; the guiding roller comprises a rolling wheel; the rolling wheel is provided between the power support and the power impact element, or is provided between the guiding support and the impact guiding element; the rolling wheel comprises an axis of the rolling wheel; the rolling wheel is separated, connected in a separated manner or integrated with the axis

of the rolling wheel; when the axis of the rolling wheel is fixed to the power impact element, the rolling wheel rolls against the power support; when the axis of the rolling wheel is fixed to the power support, the rolling wheel rolls against the power impact element, thus preventing fitting sliding friction of the power impact element and the power support; or when the axis of the rolling wheel is fixed to the guiding support, the rolling wheel rolls against the impact guiding element; when the axis of the rolling wheel is fixed to the impact guiding element, the rolling wheel rolls against the guiding support, thus preventing fitting sliding friction of the guiding support and the impact guiding element and reducing wear of the impact drive device.

51. A wear-resistant impact mining machine according to claim 50, wherein the impact drive device comprises the power support and the power impact element; the guiding device comprises the guiding roller, the guiding support, and the impact guiding element; the guiding roller comprises a rolling wheel; the surface of the rolling wheel is manufactured into a convex, a recess, a V groove or a curve; the shape of the roller support or the shape of a contact surface between the impact guiding element and the rolling wheel is locked with the shape of the surface of the rolling wheel; or the shape the power support or the shape of a contact surface between the power support and the rolling wheel is locked with the shape of the surface of the rolling wheel; a motion of the impact guiding element or the power impact element is controlled to be a straight line reciprocating motion through rolling friction, thus reducing wear of the impact drive device.

52. A wear-resistant impact mining machine according to claim 36, wherein the guiding support or the power support, or the impact guiding element, or the power impact element comprises a reciprocating stroke section; the width of the reciprocating stroke section is not larger than or equal to or close to the width of the rubbing body in a rolling direction; the length of the reciprocating stroke section is equal to or close to the sum of 1/2 of the stroke of the impact guiding element or the power impact element and the roller diameter; the rollers are provided between the roller support and the impact guiding element, or provided between the power support and the power impact element and provided in the reciprocating stroke section; the reciprocating stroke section limits a rolling space and position of the rollers; the reciprocating stroke section ensures that the rollers have rolling friction with the guiding support, or the power support, or the impact guiding element, or the power impact element while moving.

53. A wear-resistant impact mining machine according to claim 36, wherein the rubbing body support comprises a pit, or the impact guiding element comprises a pit, or the power support comprises a pit or the power impact element comprises a pit; the rubbing body is provided between the rubbing body support and the impact guiding element and are provided in the pit; or the rubbing body is provided between the power support and the power impact element and are provided in the pit; the pit limits a rolling space and position of the rubbing body.

54. A wear-resistant impact mining machine according to claim 36, wherein the rubbing body support comprises a raceway, or the impact guiding element comprises a raceway, or the rubbing body support and the impact guiding element comprise a raceway; the rubbing body support, the impact guiding element and the rubbing body rolling in the raceway are locked closely to enable the impact guiding element to reciprocate through rolling friction of the rubbing body; the raceway limits a rolling space and position of the rubbing body.

55. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises the roller support, the impact guiding element, a retainer, and the guiding rollers; the retainer is provided between the roller support and the impact guiding element; the guiding roller is provided in the retainer; the thickness of the retainer is smaller than the diameter of the guiding rollers; two parts of the guiding rollers higher than the retainer are respectively provided in the roller support and the impact guiding element; the retainer is provided independently, or is fixed to the roller support, or is fixed to the impact guiding element; the roller support and the impact guiding element are matched closely with the guiding rollers in the retainer so that the impact guiding element reciprocates through rolling friction; the retainer limits a rolling space and position of the guiding rollers.

56. A wear-resistant impact mining machine according to claim 36, wherein the guiding device further comprises a guiding section; the guiding section is provided in the impact guiding element; two ends of the guiding section besides an overlapped section with the impact guiding element are equal or substantially equal in weight; the guiding section and the impact guiding element are connected in a separated manner, or integrated; the guiding section is provided in the rubbing body support; the guiding section is always located on the rubbing body support when moving, thus maintaining gravitational equilibrium at two ends of the impact guiding element in a static state or in a moving state; the rubbing body support, the rubbing body and the impact guiding element are matched closely to support the impact guiding ele-

ment to reciprocate with rolling friction or suspension friction; the power impact element drives the impact head or the impact guiding element to reciprocate.

57. A wear-resistant impact mining machine according to claim 36, wherein the impact drive device comprises a crank impact drive device, or a hydraulic impact drive device or a pneumatic impact drive device or a solid flowing impact drive device; when the rubbing body support comprises an external sleeve, the impact guiding element comprises an internal body; or when the rubbing body support comprises an internal body, the impact guiding element comprises an external body; the rubbing body is provided between the external sleeve and the internal body; the external sleeve, the internal body and the rubbing body are matched closely to reciprocate oppositely through rolling friction or suspension friction; the impact head is supported by the reciprocating external sleeve or internal body to reciprocate with rolling friction; the power impact element drives the impact head to impact.

58. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises a guiding rubbing body support and/or a guiding impact guiding element and/or guiding rubbing body; the guiding impact guiding element, the guiding rubbing body and the guiding rubbing body support are matched closely to ensure that the impact head impacts in a reciprocating manner in a straight line and/or prevent the impact head from rotating; the guiding rubbing body support and the guiding support are separated, connected in a separated manner or integrated; the guiding impact guiding element and the impact guiding element are separated, connected in a separated manner or integrated; or the impact drive device comprises a guiding power support and/or a guiding power impact element and/or guiding rubbing body; the guiding power impact element, the guiding rubbing body and the guiding power support are matched closely to ensure that the power impact element reciprocates in a straight line and/or prevent the power impact element from rotating; the guiding power support and the power support are separated, connected in a separated manner or integrated; the guiding power impact element and the power impact element are separated, connected in a separated manner or integrated.

59. A wear-resistant impact mining machine according to claim 58, wherein the guiding rubbing body support comprises a quadrangular rubbing body support, or a U-shaped rubbing body support, or a frame-shaped rubbing body support, or a box rubbing body support, or a triangular rubbing body support, or an oval rubbing body support, or a polygonal rubbing body support, or an irregular rubbing body support, or a raceway rubbing body support, or a pit rubbing body support, or a reciprocating stroke section rubbing body support, or a retainer rubbing body support, or a circulating raceway rubbing body support, or a groove-shaped rubbing body support, or an I-shaped rubbing body support, or a spline housing rubbing body support, or an arc-shaped rubbing body support, or a V-shaped rubbing body support, or a reversed V-shaped rubbing body support, or a plate-shaped rubbing body support, or a cylindrical rubbing body support, or a multi-rhombus key rubbing body support; the guiding rubbing body support is separated, connected in a separated manner or integrated with the power support, or the guiding rubbing body support is separated, connected in a separated manner or integrated with the guiding support.

60. A wear-resistant impact mining machine according to claim 58, wherein the guiding impact guiding element comprises a quadrangular impact guiding element, or a U-shaped impact guiding element, or a frame-shaped impact guiding element, or a V-shaped impact guiding element, or a triangular impact guiding element, or an oval impact guiding element, or a polygonal impact guiding element, or an irregular impact guiding element, or a raceway impact guiding element, or a pit impact guiding element, or a reciprocating stroke section impact guiding element, or a retainer impact guiding element, or a circulating raceway impact guiding element, or a groove-shaped impact guiding element, or an I-shaped impact guiding element, or a spline housing impact guiding element, or an arc-shaped impact guiding element, or a V-shaped impact guiding element, or a reversed V-shaped impact guiding element, or a plate-shaped impact guiding element, or a cylindrical impact guiding element, or a multi-rhombus key impact guiding element; the guiding impact guiding element is separated, connected in a separated manner or integrated with the impact guiding element, or the guiding impact guiding element is separated, connected in a separated manner or integrated with the power impact element.

61. A wear-resistant impact mining machine according to claim 36, wherein the roller comprises a spherical roller, or an oval roller, or a dumbbell-shaped roller, or a circular column roller, or a conical roller, or a circular ring-shaped roller, or a rolling wheel roller, or a platform-shaped column roller, or a platform-shaped ball roller, or a platform-shaped drum roller, or a groove-shaped drum roller, or a groove-shaped column roller, or a groove-shaped ball roller, or a groove-shaped rolling wheel roller, or a groove-shaped oval roller, or a roller with an axe, or a roller with a hole, or a multi-rhombus key roller, a multi-rhombus sleeve roller, or a rolling drum-shaped roller, or a rolling bear roller, or a rolling needle roller or

a rolling barrel roller, or a linear bearing; the roller and the guiding roller are separated, connected in a separated manner or integrated.

62. A wear-resistant impact mining machine according to claim 36, wherein the shapes/shape of the impact guiding element and/or the rubbing body support are/is locked closely with the shape of the rubbing body to form a guiding position-limiting structure; or the shape of the power impact element or the power support is locked closely with the shape of the rubbing body to form a power position-limiting structure; the position-limiting structure controls a moving direction of the impact guiding element or the power impact element, and/or prevents the impact guiding element or the power impact element from rotating; the guiding position-limiting structure and the power position-limiting structure are separated, connected in a separated manner or integrated.

63. A wear-resistant impact mining machine according to claim 36, wherein the power support comprises a cylinder; the power impact element comprises a piston; the cylinder comprises a square cylinder, or a spline housing cylinder, or an arc-shaped cylinder, or an oval cylinder, or a circular cylinder or a polygonal cylinder or a cylindrical cylinder; the shapes/shape of the piston and/or the power rollers are/is locked closely with the shape of the cylinder to form a power position-limiting structure; a moving direction of the piston is controlled through rolling friction or suspension friction.

64. A wear-resistant impact mining machine according to claim 36, wherein the power support comprises a cylinder; the power impact element comprises a piston; the piston comprises a square piston, or a U-shaped piston, or a frame-shaped piston, or a groove-shaped piston, or a spline-shaped piston, or an arc-shaped piston, or a V-shaped piston, or an oval piston, or a circular piston, or a plate-shaped piston, or a polygonal piston, or a multi-rhombus key piston, or an E-shaped piston; the shapes/shape of the cylinder and/or the power rollers are locked closely with the shape of the piston to form a power position-limiting structure; a moving direction of the piston is controlled through rolling friction or suspension friction.

65. A wear-resistant impact mining machine according to claim 36, wherein the impact guiding element comprises a raceway impact guiding element, or a pit impact guiding element, or an impact guiding element with a bracket, or a circulating raceway impact guiding element, or a stroke section impact guiding element, or a position-limiting impact guiding element, or a cylindrical impact guiding element, or a U-shaped impact guiding element, or a V-shaped impact guiding element, or a polygonal impact guiding element, or a frame-shaped impact guiding element, or an irregular impact guiding element, or an E-shaped impact guiding element.

66. A wear-resistant impact mining machine according to claim 36, wherein the rubbing body support comprises a raceway rubbing body support, or a pit rubbing body support, or a rubbing body support with a bracket, or a circulating raceway rubbing body support, or a stroke section rubbing body support, or a position-limiting rubbing body support, or a cylindrical rubbing body support, or a U-shaped rubbing body support, or a V-shaped rubbing body support, or a polygonal rubbing body support, or a frame-shaped rubbing body support, or a box-shaped rubbing body support, or an irregular rubbing body support.

67. A wear-resistant impact mining machine according to claim 36, wherein the power impact element comprises a raceway power impact element, or a pit power impact element, or a power impact element with a bracket, or a circulating raceway power impact element, or a stroke section power impact element, or a position-limiting power impact element, or a cylindrical power impact element, or a U-shaped power impact element, or a frame-shaped power impact element, or an irregular power impact element, or an E-shaped power impact element, or a polygonal power impact element.

68. A wear-resistant impact mining machine according to claim 36, wherein the power support comprises a raceway power support, or a pit power support, or a power support with a bracket, or a circulating raceway power support, or a stroke section power support, or a position-limiting power support, or a cylindrical power support, or a U-shaped power support, or a E-shaped power support, or a polygonal power support, or a box-shaped power support, or a frame-shaped power support, or an irregular power support.

69. A wear-resistant impact mining machine according to claim 36, wherein the rubbing body is provided around the impact guiding element, or provided at one side of the impact guiding element, or provided at two or more sides of the impact guiding element; or the rubbing body is provided around the power impact element, or provided at one side of the power impact element, or provided at two or more sides of the power impact element; the power impact element comprises a piston, a cylinder, a piston rod or a guiding rod.

70. A wear-resistant impact mining machine according to claim 36, wherein a circulating raceway is provided

on the impact guiding element or the guiding roller support; the circulating raceway is connected in a separated manner, or integrated with the impact guiding element or the guiding roller support; the impact guiding element is provided in the guiding roller support or is provided outside the guiding roller support; the guiding roller is provided in the circulating raceway; one part of the guiding roller exposed out of the circulating raceway is in contact with the surface of the guiding roller support or the surface of the impact guiding element; an impact guiding element main body is not in contact with the surface of the guiding roller support; the guiding rollers support the impact guiding element and the guiding roller support to reciprocate oppositely through rolling friction.

71. A wear-resistant impact mining machine according to claim 70, wherein the circulating raceway comprises an annular circulating raceway; an annular plane of the annular circulating raceway is arranged along a reciprocating direction; the annular circulating raceway is arranged around the impact guiding element, or is arranged individually on the impact guiding element or is arranged symmetrically on the impact guiding element; the guiding rollers roll in a reciprocating and circulating manner in the annular circulating raceway.

72. A wear-resistant impact mining machine according to claim 70, wherein the circulating raceway comprises a spiral circulating raceway or a wave-shaped circulating raceway; the spiral circulating raceway or the wave-shaped circulating raceway is provided on the impact guiding element or the guiding roller support; the guiding rollers roll in a circulating manner in the spiral circulating raceway or the wave-shaped circulating raceway; positions of the guiding rollers bearing a pressure between the impact guiding element and the guiding roller support change in a circulating manner, thus reducing the probability that the guiding rollers always partially roll on the impact guiding element and the guiding roller support to bear a overlarge pressure and to be damaged.

73. A wear-resistant impact mining machine according to claim 70, wherein a circulating supporting section and a circulating section of the circulating raceway are arranged along the surface of the impact guiding element or the guiding roller support; the guiding roller in the circulating supporting section supports the guiding roller support to have rolling friction with the impact guiding element; the guiding roller in the circulating sections does not support the impact guiding element to have rolling friction with the guiding roller support.

74. A wear-resistant impact mining machine according to claim 70, wherein the retainer is provided in the circulating raceway; the guiding roller is provided in the retainer and the circulating raceway; the thickness of the retainer is smaller than the guiding roller diameter; two parts of the guiding rollers higher than the retainer are respectively provided in the circulating raceway and the impact guiding element or the guiding roller support, thus preventing reverse friction between the guiding roller.

75. A wear-resistant impact mining machine according to claim 70, wherein the circulating raceway is connected or integrated with the guiding support, or the impact guiding element, or the power support, or the power impact element.

76. A wear-resistant impact mining machine according to claim 36, wherein a circulating raceway is provided on the power impact element or the power support; the circulating raceway is connected in a separated manner or integrated with the power impact element or the power support; the power impact element is provided in the power support or is provided out of the power support; the power roller is provided in the circulating raceway; the power roller exposed out of the circulating raceway is in contact with the surface of the power support or the surface of the power impact element; a power impact element main body is not in contact with the surface of the power support; the power roller supports the power impact element and the power support to reciprocate oppositely with rolling friction.

77. A wear-resistant impact mining machine according to claim 76, wherein the circulating raceway comprises an annular circulating raceway; an annular plane of the annular circulating raceway is arranged along a reciprocating direction; the annular circulating raceway is arranged around the power impact element, or is arranged individually on the power impact element or is arranged symmetrically on the power impact element; the power roller rolls in a reciprocating and circulating manner in the annular circulating raceway.

78. A wear-resistant impact mining machine according to claim 76, wherein the circulating raceway comprises a spiral circulating raceway or a wave-shaped circulating raceway; the spiral circulating raceway or the wave-shaped circulating raceway is provided on the power impact element or the power support; the power roller rolls in a circulating manner in the spiral circulating raceway or the wave-shaped circulating raceway; position of the power roller bearing a pressure between the power impact element and the power support changes in a circulating manner, thus reducing the probability that the power roller always partially rolls on the power impact element and the

power support to bear a overlarge pressure and to be damaged.

79. A wear-resistant impact mining machine according to claim 76, wherein a plane of the circulating raceway is arranged vertical to the surface of the guiding roller support or the impact guiding element or the power impact element or the cylinder or the power roller support; or the plane of the circulating raceway is arranged approximately in parallel with the surface of the guiding roller support or the impact guiding element or the power impact element or the cylinder or the power roller support; the circulating raceway comprises a circulating supporting section and a circulating section; the roller in the circulating supporting section supports rolling friction of the impact guiding element and the guiding roller support, or rolling friction of the power impact element an the cylinder, or rolling friction of the power impact element and the power roller support, while the roller in the circulating section does not support rolling friction of the guiding roller support, the impact guiding element, the power impact element, the cylinder, and the power roller support.

80. A wear-resistant impact mining machine according to claim 76, wherein the roller is arranged densely in the circulating raceway; the length of the circulating raceway enables the roller to support rolling friction of the guiding roller support and the impact guiding element or enables the roller to support rolling friction of the piston and the cylinder, or enables the rollers to support rolling friction of the power impact element and the power roller support, thus preventing partial sliding friction or collision of the guiding roller support and the impact guiding element, or the piston and the cylinder, or the power impact element and the power roller support.

81. A wear-resistant impact mining machine according to claim 76, wherein a retainer is provided in the circulating raceway; the retainer comprises a flexible retainer and a chain link retainer etc.; the power rollers is provided in the retainer and is provided in the circulating raceway; the thickness of the retainer is smaller than the power roller diameter; two parts of the power roller higher than the retainer are respectively provided in the circulating raceway and the power impact element or the power support, thus preventing reverse friction between the power rollers.

82. A wear-resistant impact mining machine according to claim 76, wherein the circulating raceway comprises a pressure-bearing circulating raceway and a pressure-free circulating raceway; the pressure-free circulating raceway is provided in a separated manner with the power support, or the power impact element, or the guiding roller support, or the impact guiding element; the pressure-free circulating raceway is detachable, thus facilitating observation, maintenance and replacement of the power roller.

83. A wear-resistant impact mining machine according to claim 76, wherein a pressure-bearing section of the circulating raceway is provided with a wear-resistant material or a high strength material, thus improving the wear resistance of the circulating raceway, improving resistance of the circulating raceway on a pressure generated by the guiding support and the impact guiding element on the circulating raceway through the guiding roller, or improving the resistance of the circulating raceway on a pressure generated by the power support and the power impact element on the circulating raceway through the power rollers, reducing massive use of the wear-resistant material and the high strength material by the impact guiding element, or the guiding support, or the power impact element, or the power support, and lowering the requirement on the integral wear resistance or strength of the guiding support, or the impact guiding element, or the power support, or the power impact element.

84. A wear-resistant impact mining machine according to claim 36, wherein the impact guiding element, or the guiding support, or the power impact element or the power support is a lightweight material; the lightweight material comprises an aluminum alloy, high strength plastic, ceramics, a titanium alloy, carbon fiber, light steel or a composite material.

85. A wear-resistant impact mining machine according to claim 36, wherein the hydraulic impact drive device, or the pneumatic impact drive device, or the solid flowing impact drive device comprises a sealing element; the sealing element is provided between the power impact element and the power support, thus preventing a liquid or a gas or a solid from entering from one side of the power impact element to the other side.

86. A wear-resistant impact mining machine according to claim 85, wherein the sealing element is provided on the power impact element; the sealing element is located at one side or two sides of the roller or located between a front roller and a back roller, thus preventing a liquid, a gas, or a solid from entering from one side of the power impact element to the other side.

87. A wear-resistant impact mining machine according to claim 85, wherein the power impact element thereon is provided with a sealing element; the sealing element is provided at one side or two sides of the circulating raceway, or is provided between a front

circulating raceway and a back raceway; the sealing piece does no reciprocate on the rollers, thus preventing a liquid, a gas or a solid from entering from one side of the power impact element into the other side; the rollers support the power impact element or the impact guiding element to reciprocate through rolling friction, thus reducing a running resistance of the power impact element or the impact guiding element and improving a moving speed of the power impact element or the impact guiding element; the sealing element is used for sealing.

88. A wear-resistant impact mining machine according to claim 36, wherein the hydraulic impact drive device, or the pneumatic impact drive device, or the solid flowing impact drive device comprises a piston, the rubbing body, a cylinder, and the rubbing body support; the rubbing body is provided around the piston or is provided at one side or are provided at two or more sides of the piston; the piston and the rubbing body are provided in the cylinder; the rubbing body supports the piston and the cylinder to reciprocate with rolling friction or suspension friction; the piston comprises a piston rod; the piston and the piston rod are separated, connected in a separated manner or integrated; the rubbing body support and the cylinder are separated, connected in a separated manner or integrated; or the rubbing body support and the piston are separated, connected or integrated; the rubbing body support comprises the roller support and/or the suspender support; the roller support comprises the guiding roller support and/or a piston roller support; the suspender support comprises the guiding suspender support and/or a piston suspender support; the guiding roller support and the piston roller support are separated, connected in a separated manner or integrated; the guiding suspender support and the piston suspender support are separated, connected in a separated manner, or integrated; the roller support and the suspender support are separated, connected in a separated manner or integrated.

89. A wear-resistant impact mining machine according to claim 88, wherein the rubbing body and the piston are integrated; the piston is a spherical piston; the cylinder is a cylindrical cylinder matched with the diameter of the spherical piston; the spherical piston and the cylindrical cylinder form sealing; the spherical piston does not use a sealing element to isolate a cavity into a pressure relief area and a pressure charging area.

90. A wear-resistant impact mining machine according to claim 36, wherein the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises the power impact element, a cylinder and a control element; the power impact element comprises a piston and a cylinder rod; the piston is provided in the cylinder; the cylinder rod is provided inside or outside the cylinder; the cylinder rod is the power impact element and the impact guiding element; the piston and the cylinder rod are separated, connected in a separated manner or integrated; the guiding roller support is provided; the guiding roller support and the cylinder are separated, connected in a separated manner or integrated; the guiding roller support is provided inside or outside the cylinder; the guiding roller is provided between the guiding roller support and the cylinder rod; the guiding roller, the cylinder rod and the guiding roller support are matched closely to form a centralizer; the control element controls flowing of a liquid, a gas or a solid; the piston moves under a pressure of the liquid, the gas or the solid; the piston drives the cylinder rod to reciprocate; the guiding roller rotates against the guiding roller support and the cylinder rod; a moving direction of the cylinder rod is controlled by the control element.

91. A wear-resistant impact mining machine according to claim 36, wherein the rubbing body support is integrated with the guiding support, or the impact guiding element, or a cylinder, or a piston, or the power support, or the power impact element, thus reducing a space occupied by the rubbing body support; the rubbing body support is integrated with the guiding support, or the impact guiding element, or the cylinder, or the piston, or the power support or the power impact element, thus realizing high structural strength and high space utilization; a limited space is used for increasing the volume of the rubbing body, thus improving the bearing capacity of the rubbing body, increasing the contact area of the rubbing body and the guiding support or the impact guiding element, or the cylinder, or the piston, or the power support or the power impact element, and avoiding an overlarge partial pressure and overlarge damage to the guiding support or the impact guiding element, or the cylinder, or the piston, or the power support or the power impact element due to undersize rubbing body.

92. A wear-resistant impact mining machine according to claim 36, wherein the guiding support is provided at two or more ends of the power support to form two or more guiding support points; the two or more ends comprise two or more ends of a guiding support main body or spatial positions comprising two or more ends out of the guiding support main body; the two or more guiding support points all support the gravity of the impact head; the rubbing body, the impact guiding element and the rubbing body support are matched closely to form a multi-point support impact head structure; the multi-point support impact head structure supports the impact head through multiple

points to centralize an impact direction of the impact head, thus maximally increasing a centralizing width to the impact head, strengthening centralizing on the impact head, maximally controlling the impact direction of the impact head, preventing the impact drive device from being damaged by an impact damage force and a reactive force, and extending the service life of the device.

93. A wear-resistant impact mining machine according to claim 36, wherein two or more rows of rubbing bodies are provided around the impact guiding element or the power impact element; the two or more rows of rubbing bodies bear a gravitational load of the impact guiding element and/or the power impact element; at least one or more rubbing bodies of one row of rubbing bodies support the impact guiding element or the power impact element to impact in a reciprocating manner, thus preventing centralized damage on the rubbing bodies or the rubbing body support caused by a gravitational load of the impact guiding element or the power impact element on only one row of rubbing bodies.

94. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises the impact guiding element; the impact guiding element comprises an upper impact guiding element and a lower impact guiding element or a left impact guiding element and a right impact guiding element; the impact drive device comprises the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device; the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises the power impact element; the power impact element is provided between the upper impact guiding element or the lower impact guiding element, or is provided between the left impact guiding element or the right impact guiding element; the upper impact guiding element or the lower impact guiding element or the left impact guiding element or the right impact guiding element forms a multi-point support impact head structure.

95. A wear-resistant impact mining machine according to claim 36, wherein the rubbing body is closely locked with the rubbing body support and/or the impact guiding element through a contact surface; the contact surfaces of the rubbing body with the rubbing body support and/or the impact guiding element are as large as possible; or the contact surfaces of the rubbing body and a cylinder and/or a piston etc. are closely locked; the contact surfaces of the rubbing body and the cylinder and/or the piston etc. are as large as possible, thus preventing an overlarge partial stress on the rubbing body, reducing partial friction of the rubbing body on the rubbing body support and/or the impact guiding element, or reducing partial friction of the rubbing body on the cylinder and/or the piston, and strengthening centralizing on the impact guiding element or the piston; the rubbing body support and/or the impact guiding element are/is closely locked with the rubbing body through the contact surfaces to limit a moving space and position of the rubbing body; or the cylinder and/or the piston are/is closely locked with the rubbing body through the contact surfaces to limit a moving space and position of the rubbing body.

96. A wear-resistant impact mining machine according to claim 36, wherein the rubbing body is provided between the guiding support and the impact guiding element, or is provided between a cylinder and the impact guiding element, or is provided between the power support and the power impact element; the rubbing body, the impact guiding element and the rubbing body support are matched closely to support the impact head at multiple points through rolling friction or suspension friction to impact; the impact guiding element is actually an extension and damage of the power impact element; through the extension and damage of the impact guiding element, a centralizing width on the impact head is increased maximally, centralizing on the impact head is strengthened, and the impact head is controlled maximally to prevent the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device from being damaged by an impact damage force and a reactive force.

97. A wear-resistant impact mining machine according to claim 36, wherein
the impact guiding element is provided on the rubbing body support; the impact guiding element or the rubbing body support comprises a liquid suspender or a gas suspender; or the power impact element or the power support comprises a liquid suspender or a gas suspender; or the impact guiding element and the rubbing body support comprise a magnetic suspender; or the power impact element and the power support comprises a magnetic suspender; the magnetic suspender comprises an electromagnetic suspender, or a permanent magnet suspender; the suspender enables the impact guiding element and the rubbing body support or the power impact element and the power support to form suspension friction; the suspension friction reduces a frictional resistance or friction damage between the impact guiding element and the rubbing body support or between the power impact element and the power support, thus improving the service life of the impact drive device or the guiding device.

98. A wear-resistant impact mining machine according to claim 97, wherein the suspender comprises a gas source, a control valve, a transmission pipeline, and a gas cavity; the gas cavity is provided on the guiding device or the impact drive device; a gas suspender is formed between the guiding support and the impact guiding element; or a gas suspender is formed between the power support and the power impact element; the gas suspender supports the impact guiding element to reciprocate with suspension friction; or the gas suspender supports the power impact element to reciprocate with suspension friction.

99. A wear-resistant impact mining machine according to claim 97, wherein the liquid suspender comprises a liquid medium source, a control valve, a transmission pipeline and a liquid cavity; the liquid cavity is provided on the guiding device or the impact drive device; a liquid suspender is formed between the guiding support and the impact guiding element; or a liquid suspender is formed between the power support and the power impact element; the liquid suspender supports the impact guiding element to reciprocate with suspension friction or the liquid suspender supports the power impact element to reciprocate with suspension friction.

100. A wear-resistant impact mining machine according to claim 97, wherein the magnetic suspender comprises an electromagnetic suspender, or a permanent magnet suspender; the electromagnetic suspender comprises an electromagnet; the permanent magnet suspender comprises a permanent magnet; the electromagnet or the permanent magnet is provided on the impact guiding element and the guiding support or is provided on the power impact element and the power support.

101. A wear-resistant impact mining machine according to claim 100, wherein the impact guiding element and the guiding support or the power impact element and the power support comprise an N pole permanent magnet; or the impact guiding element and the guiding support or the power impact element and the power support comprise an S pole permanent magnet; N pole permanent magnets repel each other and S pole permanent magnets repel each other to form a magnetic suspender; the power impact element drives the impact guiding element to reciprocate; the magnetic suspender supports the impact guiding element and the guiding support to reciprocate oppositely with suspension friction; or the magnetic suspender supports the power impact element and the power support to reciprocate oppositely with suspension friction.

102. A wear-resistant impact mining machine according to claim 100, wherein the impact guiding element and the guiding support or the power impact element or the power support comprise a cathode electromagnet; or the impact guiding element and the guiding support or the power impact element or the power support comprise an anode electromagnet; cathode electromagnets repel each other and anode electromagnets repel each other to form a magnetic suspender; the power impact element drives the impact guiding element to reciprocate; the magnetic suspender supports the impact guiding element and the guiding support to reciprocate oppositely with suspension friction; or the magnetic suspender supports the power impact element or the power support to reciprocate oppositely with suspension friction.

103. A wear-resistant impact mining machine according to claim 36, wherein one end or two ends of the power impact element are provided with a damage-prevention mechanism; the damage-prevention mechanism is provided as a rotating structure or a split structure; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner.

104. A wear-resistant impact mining machine according to claim 103, wherein the damage-prevention mechanism comprises an arc-shaped catching groove type or a rotating joint; the arc-shaped catching groove type comprises an arc-shaped raised head and a groove moveably locked with the arc-shaped raised head; the groove and the power impact element are connected in a separated manner or integrated; the arc-shaped raised head moveably locked with the groove and the impact head are connected in a separated manner or integrated; the rotating joint comprises a flexible universal joint rotating joint or a universal bearing rotating joint, or a platform-type rotating joint with multiple degrees of freedom or a universal coupling rotating joint; the flexible universal joint rotating joint comprises an elastic element and a universal joint; when the universal joint is stressed, an relative motion of the universal joint is adjusted by the elastic body; the universal joint bearing rotating joint comprises a universal joint base, and a rotating joint; the rotating joint is fixed on the universal joint base; when the universal joint bearing is stressed, a relative motion is adjusted by the universal joint base; the platform-type rotating joint with multiple degrees of freedom is composed of a moving cylinder, an upper universal hinge, a lower universal hinge, an upper platform and a lower platform; when the upper platform and the lower platform are stressed, the upper platform moves in multiple de-

grees of freedom in a space through a telescopic movement of the moving cylinder; the universal coupling rotating joint is a cross shaft rotating joint; the cross shaft rotating joint comprises a cross shaft and a cross universal joint fork; the cross universal joint fork moves relatively through connection of the cross shaft.

105. A wear-resistant impact mining machine according to claim 103, wherein the damage-prevention mechanism comprises a rotating structure; the rotating structure comprises a ball-end catching groove type; the ball-end catching groove type comprises a ball end and a ball end groove moveably locked with the ball end; the ball end and the power impact element are connected in a separated manner or integrated; the ball end groove moveably locked with the ball end and the impact head are connected in a separated manner or integrated; the power impact element and the impact head are connected or separated; the power impact element drives the impact head to impact; an impact damage force is applied on the damage-prevention mechanism; the rotating structure of the damage-prevention mechanism is stressed to rotate.

106. A wear-resistant impact mining machine according to claim 36, wherein a buffering mechanism is provided between the jacking device or the reciprocating impact part or the machine body or the jacking device and the reciprocating impact part, or between the jacking device and the machine body.

107. A wear-resistant impact mining machine according to claim 36, wherein the buffering mechanism comprises a structural buffering mechanism or a power buffering mechanism.

108. A wear-resistant impact mining machine according to claim 107, wherein the structural buffering mechanism comprises a fixing support, a buffering support and a buffering element.

109. A wear-resistant impact mining machine according to claim 107, wherein the power buffering mechanism comprises a sliding stroke spline shaft housing buffering mechanism and a belt buffering mechanism.

110. A wear-resistant impact mining machine according to claim 36, wherein the jacking device or the reciprocating impact part or the frame comprises a structural buffering mechanism; the structural buffering mechanism comprises a fixing support and a buffering support; when the fixing support is provided on the jacking device, the buffering support is correspondingly provided on the reciprocating impact part; or when the fixing support is provided on the frame, the buffering support is correspondingly provided on the jacking device; or when the buffering support is provided on the frame, the fixing support is provided on the reciprocating impact part; a buffering element is provided between the fixing support and the buffering support, or is provided between the jacking device and the frame, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; a buffering guiding element is provided on the fixing support and the buffering support, or is provided on the jacking device and the frame, or is provided on the jacking device and the reciprocating part, or is provided on the frame and the reciprocating impact part; the power impact element drives the impact head to impact; when an impact reactive force is applied on the buffering support and the fixing support, or is applied on the jacking device and the frame, or is applied on the jacking device and the reciprocating impact part, or is applied on the frame and the reciprocating impact part, the buffering element is damaged to absorb the impact reactive force and the buffering guiding element controls a buffering direction to be reciprocating straight line buffering, thus preventing the impact head from oscillating non-directionally during buffering.

111. A wear-resistant impact mining machine according to claim 36, wherein the jacking device or the reciprocating impact part or the frame comprises a structural buffering mechanism; the structural buffering mechanism comprises a fixing support and a buffering support; or when the fixing support is provided on the jacking device, the buffering support is correspondingly provided on the reciprocating impact part; or when the fixing support is provided on the machine body, the buffering support is correspondingly provided on the jacking device; or when the buffering support is provided on the frame, the fixing support is provided on the reciprocating impact part; when the fixing support comprises a buffering guiding element, the buffering support comprises a buffering guiding sleeve; or when the buffering support comprises a buffering guiding element, the fixing support comprises a buffering guiding sleeve; when a guiding lug boss or a guiding groove is provided on the buffering guiding element, a guiding groove or a guiding lug boss locked with the guiding lug boss and the guiding groove is provided on the buffering guiding sleeve; two sides of a convex part of the guiding lug boss are provided with a buffering element; the buffering guiding element supports the buffering guiding sleeve to slide in a reciprocating manner in a straight line along the buffering guiding sleeve or the buffering guiding sleeve supports the buffering guiding element to slide in a reciprocating manner in a straight line along the buffering guiding sleeve;

the buffering guiding element, the buffering element and the buffering guiding sleeve form a bi-directional buffering mechanism; the power impact element drives the impact head to impact; an impact reactive damage force is applied on the bi-directional buffering mechanism; the bi-directional buffering mechanism absorbs the impact reactive force; the power impact element drives the impact head to reciprocate; the buffering elements of the front part of the guiding lug boss and the back part of the guiding lug boss absorb an impact reactive force of the impact head; the buffering guiding element, the buffering guiding sleeve and the buffering elements are matched with each other to absorb the impact reactive force of the impact head and control a buffering direction to be reciprocating straight line buffering; the buffering guiding sleeve slides oppositely in a straight line against the buffering guiding element, thus preventing the jacking device, the impact drive device and the guiding device from oscillating non-directionally and stabilizing an impact direction of the impact head.

112. A wear-resistant impact mining machine according to claim 110 or 111, wherein the fixing support and the buffering support comprise a retaining structure or the buffering guiding element and the buffering guiding sleeve comprise a retaining structure; the retaining structure comprises a retaining element; the retaining element prevents the fixing support and the buffering support from being detached during opposite reciprocating sliding or the retaining element prevents the buffering guiding element and the buffering guiding sleeve from being detached during opposite reciprocating sliding; the retaining element and the fixing support are provided separately, or connected or integrated; or the retaining element and the buffering support are provided separately, or connected or integrated; or the retaining element and the buffering guiding element are provided separately or connected or integrated; or the retaining element and the buffering guiding sleeve are provided separately or connected or integrated.

113. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor; the jacking device or the reciprocating impact part or the frame comprises a structural buffering mechanism; the structure buffering mechanism comprises a fixing support and a buffering support; or when the fixing support is provided on the jacking device, the buffering support is correspondingly provided on the reciprocating impact part; or when the fixing support is provided on the frame, the buffering support is correspondingly provided on the jacking device; or when the buffering support is provided on the frame, the fixing support is provided on the reciprocating impact part; a buffering element is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; a power buffering mechanism is provided between the rotation power source element and the rotation impact transmission element, or is provided on the rotation impact transmission element; the power buffering mechanism comprises a sliding stroke spline shaft housing buffering mechanism or a belt buffering mechanism; the sliding stroke spline shaft housing buffering mechanism comprises a spline shaft and a spline housing; a sliding reciprocating stroke section is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the belt buffering mechanism comprises a driving pulley, a driven pulley and a belt; the driving pulley is fixed on the fixing support; the driving pulley is connected with a drive shaft of the electric machine, the hydraulic motor, or the pneumatic motor; the driven pulley is provided on the buffering support; the belt is provided on the driving pulley and the driven pulley; the driven pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force; the belt buffering device prevents the electric machine, the hydraulic motor or the pneumatic motor from being damaged; the structural buffering mechanism further comprises a buffering guiding element; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device; the structural buffering mechanism absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the struc-

tural buffering mechanism and is matched with the sliding stroke spline shaft housing buffering mechanism or the belt buffering mechanism to absorb and buffer an impact reactive force of the impact head and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame from being damaged by buffering non-directional oscillation, and ensuring that an impact direction of the impact head faces an objected to be mined.

114. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises a buffering device; the buffering device comprises a rotation power buffering mechanism; the rotation power buffering mechanism comprises a sliding stroke spline shaft housing buffering mechanism; the sliding stroke spline shaft housing buffering mechanism comprises a spline shaft and a spline housing; a sliding reciprocating stroke section is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the spline shaft and the spline housing are connected glidingly with reciprocating buffering; the impact drive device comprises a rotation power source element and a rotation impact transmission element; the rotation power source element comprises an electric machine, or a hydraulic motor or a pneumatic motor; the electronic machine, or the hydraulic motor or the pneumatic motor comprises a drive shaft; the spline housing or the spline shaft is connected or integrated with the drive shaft; the spline shaft or the spline housing is connected or integrate with the rotation impact transmission element.

115. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises a buffering device; the buffering device comprises a rotation power buffering mechanism; the rotation power buffering mechanism comprises a belt buffering mechanism; the jacking device comprises a rocker arm; the rocker arm comprises a rocker arm buffering element and a rocker arm fixing element; the buffering device further comprises a buffering element; the buffering element is provided between the rocker arm buffering element and the rocker arm fixing element; the belt buffering mechanism comprises a driving pulley, a belt and a driven pulley; the driving pulley is fixed on the rocker arm fixing element; the driving pulley is connected with a drive shaft of an electric machine, or a hydraulic motor or a pneumatic motor; the driven pulley is provided on the rocker arm buffering element; the belt is provided on the driving pulley and the driven pulley; the driven pulley buffers as the rocker arm buffering element is impacted; the belt absorbs an impact reactive force to prevent the electric machine, or the hydraulic motor or the pneumatic motor from being damaged; the belt buffering device comprises a tensioner.

116. A wear-resistant impact mining machine according to claim 115, wherein the tensioner is provided at an inner side or an outer side of the belt; the tensioner comprises a tensioning wheel, a tensioning wheel bracket, a tensioning spring, a tensioning adjusting rod, and a tensioner base; the tensioning wheel is provided on the tensioning wheel bracket; a guiding hole is provided on the tensioning wheel bracket; one end of the tensioning adjusting rod is a polished rod and the other end is a screw rod and the middle is provided with a shoulder; the tensioning wheel bracket is matched with the polished rod end of the tensioning adjusting rod through the guiding hole; the screw rod end of the tensioning adjusting rod is in threaded connection with the tensioning base; the tensioning spring is provided between the tensioning wheel bracket and the shoulder; the tensioning wheel tightly presses the belt with an elastic force of the spring; a tensioning force is adjusted with a screwing length of the screw rod and the tensioning base.

117. A wear-resistant impact mining machine according to claim 115, wherein the belt buffering device comprises the tensioner; the tensioner comprises a sliding base and a tensioning spring; the driving pulley and the electric machine, or the hydraulic motor or the pneumatic motor are installed on the sliding base; the sliding base is matched glidingly with the rocker arm fixing element; one end of the tensioning spring is connected with the sliding base and the other end is connected with the rocker arm fixing element; a certain acting force is applied on the sliding base by the spring to tension the belt.

118. A wear-resistant impact mining machine according to claim 36, wherein the jacking device comprises a rocker arm lifting mechanism or a vertical lifting mechanism.

119. A wear-resistant impact mining machine according to claim 118, wherein the rocker arm lifting mechanism is a parralellagram rocker arm or a single rocker arm; the parralellagram rocker arm includes a main rocker arm and a secondary rocker arm; the reciprocating impact part includes a supporting box or a supporting frame; one end of the main rocker arm is hinged with the machine body and the other end is hinged with the supporting box or the supporting frame; one end of the secondary rocker arm is hinged with the machine body and the other end is hinged with the supporting box or the supporting frame; the main rocker arm and/or the secondary rocker arm support/supports the reciprocating impact part; the

main rocker arm and the secondary rocker arm are matched with each other to adjust a mining direction or position of the impact head and ensure that the next impact of the impact head is applied on an object to be mined; the travelling part drives the machine body to travel to realize reciprocating impact and continuous mining.

120. A wear-resistant impact mining machine according to claim 118, wherein the vertical lifting mechanism drives the reciprocating impact part to move up and down vertically; the vertical lifting mechanism comprises a lifting platform, a lifting platform support and a vertical lifting driver; the vertical lifting driver comprises a rope and rope coiler, or a gear and rack, or a screw pole, or a shaft coupling, or a chain wheel and chain, or a hydraulic element or a pneumatic element; the vertical lifting driver drives the vertical lifting platform to ascend and descend vertically; the vertical lifting mechanism further comprises a locating locker; the locating locker comprises a bolt, a lock tongue, a cushion block, a pull rope, a hydraulic cylinder, or a pneumatic cylinder; the locating locker locks the lifting platform.

121. A wear-resistant impact mining machine according to claim 36, wherein the jacking device comprises a rocker arm; the machine body comprises a rotating disc; the rocker arm is provided on the rotating disc; the rotating disc drives the rocker arm to rotate at a front part of the machine body.

122. A wear-resistant impact mining machine according to claim 36, wherein the jacking device comprises a rocker arm; the machine body comprises a rotating disc; the jacking device comprises a rocker arm lifting cylinder; one end of the rocker arm lifting cylinder is fixed on the rotating disc and the other end is hinged with the rocker arm; the rocker arm lifting cylinder drives the rocker arm to move up and down.

123. A wear-resistant impact mining machine according to claim 36, wherein the jacking device comprises a rocker arm; the machine body comprises a rotating disc; the jacking device comprises a rocker arm lifting cylinder; the rocker arm lifting cylinder drives the rocker arm to move up and down; the rotating disc drives the rocker arm to move left and right; the rotating disc and the rocker arm lifting cylinder are matched to adjust the to impact a material impact head on multiple positions in multiple directions.

124. A wear-resistant impact mining machine according to claim 36, wherein the jacking device comprises a translation lifting mechanism; the translation lifting mechanism is provided at a front part of the machine body; the translation lifting mechanism enables translation of the reciprocating impact part relative to the machine body.

125. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises a supporting box or a supporting frame; the impact drive device comprises a crank impact drive device; the crank impact drive device comprises a multi-throw crank multi-rod impact mechanism, and a power output component; the multi-throw crank multi-rod impact mechanism comprises a multi-throw crank and connecting rods; the multi-throw crank comprises power concentric shaft sections, connecting handles and eccentric shafts; the power concentric shaft section, the connecting handles and the eccentric shafts are separated, connected or integrated; one end of the power concentric shaft section of the multi-throw crank is connected with the power output component of the crank impact drive device; the other end of the power concentric shaft section is provided with two or more connecting handles and eccentric shafts; the power concentric shaft section of the multi-throw crank is installed on the supporting box or the supporting frame; an eccentric shaft of the multi-throw crank is connected with one end of the connecting rod and the other end of the connecting rod is connected or separated with the impact head; one eccentric shaft drives one or more connecting rods to impact in a reciprocating manner.

126. A wear-resistant impact mining machine according to claim 125, wherein the eccentric shafts are one or more than two eccentric shafts; more than two eccentric shafts are arranged radially at intervals along the power concentric shaft section to form angular difference; the impact drive device includes a power output component; the power concentric shaft section of the multi-throw crank and the power output component are separated, connected or integrated.

127. A wear-resistant impact mining machine according to claim 125, wherein the multi-throw crank is provided with a liquid channel; the liquid channel is provided on the power concentric shaft section, the connecting handle and/or the eccentric shafts.

128. A wear-resistant impact mining machine according to claim 36, wherein the impact drive device is the crank impact drive device; the crank impact drive device comprises a power source element, a cam shaft and a cam; the cam shaft and the cam are connected in a separated manner or integrated; the power source element drives the cam shaft to rotate; the cam installed on the cam shaft drives the impact head to impact.

129. A wear-resistant impact mining machine according to claim 36, wherein the crank impact drive device comprises a crank impact drive mechanism; the

crank impact drive mechanism comprises a power source element, an eccentric shaft and the power impact element; the eccentric shaft is hinged with one end of the power impact element; the power source element drives the eccentric shaft to rotate; the eccentric shaft drives the power impact element to impact in a reciprocating manner.

130. A wear-resistant impact mining machine according to claim 36, wherein the crank impact drive device comprises a crank slider impact drive mechanism; the crank slider impact drive mechanism comprises a power source element, a crank, a slider, an oscillating bar, a connecting rod and the power impact element; one end of the crank is connected with the power source element and the other end is hinged with the slider; the slider is connected with the oscillating bar and capable of sliding on the oscillating bar; the oscillating bar is hinged with the connecting rod; the connecting rod is hinged with one end of the power impact element; the connecting rod and the power impact element are separated, connected in a separated manner or integrated; the power source element drives the crank to rotate; the crank drives the slider to enable the oscillating bar to oscillate; through the connecting rod, the oscillating bar drives the power impact element to move.

131. A wear-resistant impact mining machine according to claim 36, wherein the crank impact drive device comprises a crank oscillating bar impact drive mechanism; the crank oscillating bar impact drive mechanism comprises a rotating part, a slider, an oscillating bar and a straightening connecting rod; the rotating part comprises a rotating handle or a rotating wheel; an end of the rotating handle or the rotating wheel is installed with the slider; the slider is connected glidingly with the oscillating bar; one end of the oscillating bar is hinged and fixed; through the slider, the rotating handle or the rotating wheel drives the other end of the oscillating bar to oscillate in a reciprocating manner; one end of the straightening connecting rod is connected with the oscillating end of the oscillating bar and the other end is hinged with the power impact element or the impact guiding element; the straightening connecting rod and the power impact element are separated, or connected in a separated manner, or integrated; the straightening connecting rod and the impact guiding element are separated, or connected in a separated manner, or integrated; the oscillating bar oscillates to drive the straightening connecting rod to oscillate; the straightening connecting rod drives the impact guiding element or the power impact element to impact in a reciprocating manner.

132. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the impact head; the impact guiding element is provided with setting teeth; the impact drive device is a transmission device; the transmission device comprises a gear transmission device; the gear transmission device comprises a power wheel and a transmission wheel; the transmission wheel is provided with setting teeth; the power wheel drives the transmission wheel; the setting teeth on the transmission wheel are meshed with the setting teeth on the impact guiding element; when the setting teeth on the transmission wheel are rotated to be meshed with the setting teeth on the impact guiding element, the impact guiding element is driven to impact a coal wall or a rock wall; when the setting teeth on the impact guiding element correspond to a toothless portion of the setting teeth on the transmission wheel, the impact guiding element is separated from the transmission wheel; at the moment, the impact head is held back by the coal wall or the rock wall when the machine body travels; the impact head draws back the impact guiding element; when the setting teeth on the transmission wheel are rotated to be meshed with setting teeth of the impact guiding element again, the impact guiding element is driven again to impact the coal wall or the rock wall.

133. A wear-resistant impact mining machine according to claim 36, wherein the impact drive device comprises the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device; the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises two or more power impact elements; two or more power impact elements and the impact head are connected, separated or integrated.

134. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises a supporting box; the impact drive device comprises a rotation power source element; the rotation power source element comprises a transmission component; the transmission component comprises a variable transmission component; the variable transmission component is a gear transmission component; when there are multiple gear transmission components, a part of the gear transmission components are provided in the supporting box while the other part of the gear transmission components are provided inside the supporting box or outside the supporting box.

135. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises a supporting box; the impact drive device comprises a rotation power source element; the rotation power source element comprises a transmis-

sion component; the transmission component comprises a variable transmission component; the variable transmission component comprises a gear transmission component or a combination of a gear transmission component and a belt transmission component.

136. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises one or more guiding devices.

137. A wear-resistant impact mining machine according to claim 36, wherein the guiding device is composed of two or more guiding devices; the impact drive device drives two or more power impact elements and two or more guiding devices to match with each other; two or more power impact elements drive two or more impact heads.

138. A wear-resistant impact mining machine according to claim 36, wherein the guiding device is composed of two or more guiding devices; the impact drive device drives one power impact element and two or more guiding devices to be matched with each other.

139. A wear-resistant impact mining machine according to claim 36, wherein the impact guiding element is provided at one side, a front part, two or more sides or the periphery of the impact drive device.

140. A wear-resistant impact mining machine according to claim 36, wherein the impact head comprises impact external layer material teeth and impact internal layer material teeth; the impact internal layer material teeth are shaped or arranged so as to fall an internal layer material of a coal wall or a rock wall to be mined; the impact external layer material teeth are shaped and arranged so that a material fallen by the impact internal layer material teeth can flow out from gaps between the impact external layer material teeth; the impact external layer material teeth and impact internal layer material teeth are arranged in parallel to form a multi-layer impact head; the mining width and mining efficiency are improved by multi-layer impact teeth.

141. A wear-resistant impact mining machine according to claim 36, wherein the impact head comprises a step tooth impact cutting mechanism; the step tooth impact cutting mechanism comprises impact teeth; the impact teeth are multi-layer impact teeth; tooth heads are provided on the impact teeth; the tooth heads and the impact teeth are connected in a separated manner or integrated; the distances between tooth heads of two adjacent layers of impact teeth are different; a coal wall or a rock wall to be mined is impacted into steps; two or more opposite free surfaces are formed on each step of the step-shaped coal wall or rock wall; the pressure stress and structural strength of the step-shaped coal wall or rock wall are greatly reduced compared with the original planar coal wall or rock wall; after the coal wall or the rock wall is impacted into steps, a material is fallen by reasonably using the two opposite free surfaces of the step-shaped coal wall or rock wall when impact teeth of each layer perform mining again, thus greatly reducing impact resistance, avoiding oversize lumps of the material fallen by the impact head, reducing power consumption and improving impact efficiency.

142. A wear-resistant impact mining machine according to claim 36, wherein the impact head comprises an impact external layer material tooth frame and impact external layer material teeth; the impact external layer material tooth frame is provided with a discharge hole; the impact external layer material teeth are provided on the impact external layer material tooth frame and face a to-be-mined surface; the impact external layer material teeth are shaped or arranged to fall an external layer material of a layer to be mined; the impact head comprises an impact internal layer material tooth frame and impact internal layer material teeth; the impact internal layer material teeth and the impact internal layer material tooth frame are connected in a separated manner or integrated; the impact internal layer material teeth are shaped or arranged to fall an internal layer material of the layer to be mined; the discharge hole enables the material fallen by the impact internal layer material teeth to flow out; multiple layers of impact mechanisms are matched with each other to fall and discharge a material simultaneously.

143. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the impact head; the impact head comprises an impact tooth frame and impact teeth; impact guiding elements are arranged on the impact tooth frame symmetrically or asymmetrically; the impact teeth and the impact tooth frame connected in a separated manner or integrated.

144. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises an impact head; the impact head comprises an impact tooth frame and impact teeth; the impact teeth are multi-layer impact teeth; tooth heads are provided on the impact teeth; the impact teeth and the tooth heads are connected in a separated manner or integrated; the tooth heads are arranged into spherical impact heads, or conical impact heads, or hemispherical impact heads, or shovel-shaped impact heads, or trapezoidal impact heads, or triangular impact heads, or step-shaped impact heads.

145. A wear-resistant impact mining machine according to claim 143 or 144, wherein the impact tooth frame comprises an arc-shaped plate, or a trapezoidal bracket, or a semicircular bracket, or a triangular bracket, or a conical bracket, or a plat plane bracket, or a frame-shaped bracket or a V-shaped bracket.

146. A wear-resistant impact mining machine according to claim 143 or 144, wherein the impact head comprises the impact teeth; the impact teeth comprise top surface cleaning teeth, bottom surface cleaning teeth or side cleaning teeth.

147. A wear-resistant impact mining machine according to claim 143 or 144, wherein the impact head comprises the impact tooth frame and the impact teeth; top surface cleaning teeth, bottom surface cleaning teeth and side cleaning teeth are provided on the same impact tooth frame.

148. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the impact head; the impact head comprises shovel teeth; the impact head is composed of one or more shovel teeth; the shovel teeth comprise long shovel teeth or short shovel teeth; the sides of the shovel teeth are provided with or not provided with cutting edges.

149. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the impact head; the impact head comprises shovel teeth; the shovel teeth comprise conical teeth, wedged teeth, axe teeth, cutter teeth or chisel teeth.

150. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the impact head; the impact head comprises shovel teeth and fixing components; the shovel teeth and the fixing components are integrated or moveably connected; the moveable connection comprises a splicing type, a catching groove type, a step type, a spherical surface type, a pin tooth type, or a bolt fixing type.

151. A wear-resistant impact mining machine according to claim 36, wherein the impact head completes coal falling and surface cleaning or coal impacting and falling at the same time by a reciprocating impact.

152. A wear-resistant impact mining machine according to claim 36, wherein the impact guiding element is provided at two sides of the impact drive device; one end of the impact guiding element is provided with an impact head and the other end is provided with the same or different impact heads; different impact heads comprise impact heads with different shapes or different weights.

153. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the impact head; the impact head is installed at a front part of the machine body, or at one side or two or more sides of the machine body.

154. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the impact head; the jacking device comprises a rocker arm; an angle adjuster is provided between the impact head and the rocker arm or between the impact head and the machine body; the angle adjuster adjusts an impact direction of the impact head.

155. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises a supporting box or a supporting frame; the supporting box or the supporting frame comprises a lubricating system.

156. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises a supporting box or a supporting frame; the supporting box is fully sealed or partly sealed; the supporting box or the supporting frame comprises a sealing element; the sealing element is provided on a moveable junction of the impact drive device or the guiding device and the supporting box; or the sealing element is provided on a moveable junction of the impact drive device or the guiding device and the supporting frame.

157. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises the impact guiding element; the reciprocating impact part comprises a supporting box; the junction of the power impact element and the impact head is provided with an impact element hood; or the junction of the impact guiding element and the impact head is provided with a guiding element hood; the power impact element and the impact head are connected or separated; the impact guiding element and the impact head are connected or integrated; a sealing element is provided between the impact element hood or the guiding element hood and the supporting box.

158. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises the impact guiding element and the rubbing body support; the impact drive device comprises the power impact element and the power support; a sealing element is provided between the impact guiding element and the rubbing body support, or is provided between the power impact element and the power

support.

159. A wear-resistant impact mining machine according to claim 85, 86, 87, 156, 157 and 158, wherein the sealing element comprises a sealing cavity, a sealing fin, a sealing plug, a sealing ring or a sealing gasket.

160. A wear-resistant impact mining machine according to claim 85, 86, 87, 156, 157 and 158, wherein the sealing element is made of a rubber material, a polyurethane material, a nylon material, a plastic material, a metal material or a mixed material.

161. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises the impact guiding element; the junction of the power impact element and the impact head is provided with an impact element hood; or the junction of the impact guiding element and the impact head is provided with a guiding element hood; the power impact element and the impact head are connected or separated; the impact guiding element and the impact head are connected, separated or integrated; the impact guiding element and the impact head are connected or integrated.

162. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises the impact guiding element; the impact guiding element and the power impact element are separated; the power impact element and the impact head are separated; the power impact element drives the impact head to impact; the impact head is provided on the impact guiding element; the machine body is provided on the traveling part; the traveling part drives the machine body to travel; the machine body travels to hold back the impact head by a coal wall or a rock wall.

163. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises the rubbing body support and the impact guiding element; the impact guiding element is provided on the rubbing body support; the rubbing body support is provided on the frame or is provided on the jacking device; the power impact element comprises a power impact cylinder; the impact guiding element is separated with the power impact cylinder; the power impact cylinder and the impact head are separated; the impact head are provided on the impact guiding element; the machine body is provided on the travelling part; the traveling part drives the machine body to travel; the machine body travels to hold back the impact head by a coal wall or a rock wall; the power impact cylinder drives the impact head to impact.

164. A wear-resistant impact mining machine according to claim 36, wherein the guiding rollers, or the rubbing body support, or the impact guiding element or the power impact element or the retainer is of a high strength wear-resistant material; the high strength wear-resistant material is a hard alloy, wear-resistant plastic, wear-resistant steel, wear-resistant rubber, wear-resistant ceramics, a self-lubricating wear-resistant material or a mixed wear-resistant material.

165. A wear-resistant impact mining machine according to claim 36, wherein the machine body comprises a control device, a dragging cable device, an atomizing device, a water spraying device or a cooling device.

166. A wear-resistant impact mining machine according to claim 36, wherein the frame or the jacking device comprises a crushing device or a material guiding device.

167. A wear-resistant impact mining machine according to claim 36, wherein the machine body comprises a shovel plate.

168. A wear-resistant impact mining machine according to claim 167, wherein the shovel plate comprises a star wheel setting claw or a crab claw setting claw or a rolling rake.

169. A wear-resistant impact mining machine according to claim 36, wherein the machine body comprises a conveyor.

170. A wear-resistant impact mining machine according to claim 169, wherein the conveyor is provided on the machine body to convey a material mined by the reciprocating impact part to a back part of the machine body; the conveyor comprises a scraper conveyor, a belt conveyor or an armored belt conveyor.

171. A wear-resistant impact mining machine according to claim 43, wherein the retainer comprises a cylindrical retainer, or a plate retainer, or a U-shaped retainer, or a V-shaped retainer, or a polygonal retainer, or an irregular retainer, or a triangular retainer, or a square retainer, or a chain link retainer.

172. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises the guiding roller, the guiding roller support and the impact guiding element; a circulating raceway is provided on the impact guiding element or the guiding roller support; the circulating raceway comprises an annular circulating raceway, or a spiral circulating raceway, or a wave-shaped circulating raceway, or an irregular circulating raceway; the circulating raceway and the impact guiding element or the guiding roller support are connected in a separated manner or integrated; the impact guiding element is provided in the guiding roller support; the guiding roller support

is provided in the circulating raceway; one part of the guiding roller exposed out of the circulating raceway is in contact with the surface of the guiding roller support or the surface of the impact guiding element; an impact guiding element main body is not in contact with the surface of the guiding roller support; the guiding rollers support the impact guiding element and the guiding roller support to reciprocate oppositely through rolling friction; the guiding device and the crank impact drive device are combined and provided in the jacking device or the frame; one end or two ends of the power impact element are provided with a damage-prevention mechanism; the damage-prevention mechanism comprises a rotating structure or a split structure; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type; the rotating structure or the split structure of the damage-prevention mechanism is matched with the guiding device; the power impact element drives the impact head to impact; an impact reactive force of the impact head on a coal wall or a rock wall is applied to the rotating structure or the split structure; the rotating structure is stressed to rotate or the split structure isolates a reactive damage force in a split manner, thus preventing the crank impact drive device from being damaged by the impact reactive damage force; the reciprocating impact part, or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor; the jacking device or the reciprocating impact part or the frame comprises a fixing support and a buffering support; or when the frame comprises the fixing support, the jacking device comprises the buffering support; or when the jacking device comprises the fixing support, the reciprocating impact part comprises the buffering support; or when the frame comprises the fixing support, the buffering support is correspondingly provided on the reciprocating impact part; a buffering device is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; the buffering device comprises a rotation power buffering device and a structure guiding buffering device; the rotation power buffering device is provided between the rotation power source element and the rotation impact transmission element or is provided in the rotation impact transmission element; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering device or a belt buffering device; the sliding stroke spline shaft housing buffering device comprises a spline shaft and a spline housing; a sliding reciprocating stroke section is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the belt buffering device comprises a driving pulley, a driven pulley and a belt; the driving pulley is fixed on the fixing support; the driving pulley is connected with a drive shaft of the electric machine, the hydraulic motor, or the pneumatic motor; the driven pulley is provided on the buffering support; the belt is provided on the driving pulley and the driven pulley; the driving pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force; the belt buffering device prevents the electric machine, the hydraulic motor, or the pneumatic motor from being damaged; the structure guiding buffering device comprises a buffering element and a buffering guiding element; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device; the structure guiding buffering device absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering device or the belt buffering device to absorb and buffer an impact reactive force of the reciprocating impact part and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.

173. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises the guiding rollers, the guiding roller support and the guiding impact element; the guiding roller is provided between the guiding roller support and the impact

guiding element; the guiding device comprises an external sleeve and an internal body; a raceway is provided on the external sleeve or the internal body; the guiding roller is provided in the raceway and between the external sleeve and the internal body; the external sleeve, the internal body and the guiding rollers are matched closely so that the external sleeve or the internal body reciprocates oppositely through rolling friction of the guiding rollers; the rolling friction controls an impact direction of the external sleeve or the internal body; the impact head and the reciprocating external sleeve or internal body are integrated or connected.

174. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises an external sleeve and an internal body; a retainer is provided between the external sleeve and the internal body; the guiding roller is provided in the retainer and provided between the external sleeve and the internal body; when the guiding roller support is the external sleeve, the impact guiding element is the internal body; the external sleeve supports the guiding rollers and the internal body; when the guiding roller support is the internal body, the impact guiding element is the external sleeve; the internal body supports the guiding rollers and the external sleeve; the external sleeve, the internal body and the guiding rollers are matched closely so that the external sleeve or the internal body reciprocates oppositely through rolling friction of the guiding rollers; an impact direction of the external sleeve or the internal body is controlled by rolling friction.

175. A wear-resistant impact mining machine according to claim 36, wherein the guiding device and the crank impact drive device are combined and provided in the jacking device or the frame; one end or two ends of the power impact element are provided with an damage-prevention mechanism; the damage-prevention mechanism comprises a rotating structure or a split structure; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type; the rotating structure or the split structure of the damage-prevention mechanism is matched with the guiding device; the power impact element drives the impact head to impact; an impact reactive damage force of the impact head on a coal wall or a rock wall is applied to the rotating structure or the split structure; the rotating structure is stressed to rotate or the split structure isolates the reactive damage force in a split manner, thus preventing the crank impact drive device from being damaged by the impact reactive damage force; the reciprocating impact part, or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor; the jacking device or the reciprocating impact part or the frame comprises a fixing support and a buffering support; or when the frame comprises the fixing support, the jacking device comprises the buffering support; or when the jacking device comprises the fixing support, the reciprocating impact part comprises the buffering support; or when the frame comprises the fixing support, the buffering support is correspondingly provided on the reciprocating impact part; a buffering device is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; the buffering device comprises a rotation power buffering device and a structure guiding buffering device; the rotation power buffering device is provided between the rotation power source element and the rotation impact transmission element or is provided in the rotation impact transmission element; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering device or a belt buffering device; the sliding stroke spline shaft housing buffering device comprises a spline shaft and a spline housing; a sliding reciprocating stroke section is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the belt buffering device comprises a driving pulley, a driven pulley and a belt; the driving pulley is fixed on the fixing support; the driving pulley is connected with a drive shaft of the electric machine, the hydraulic motor, or the pneumatic motor; the driven pulley is provided on the buffering support; the belt is provided on the driving pulley and the driven pulley; the driving pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force; the belt buffering device prevents the electric machine, the hydraulic motor, or the pneumatic motor from being damaged; the structure guiding buffering device comprises a buffering element and a buffering guiding element; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided

between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device; the structure guiding buffering device absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering device or the belt buffering device to absorb and buffer an impact reactive force of the reciprocating impact part and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.

176. A wear-resistant impact mining machine according to claim 36, wherein the guiding device comprises the guiding rollers, the guiding roller support and the impact guiding element; the guiding roller is provided between the guiding roller support and the impact guiding element; the guiding device further comprises a retainer; the guiding rollers comprise rolling shafts; the retainer is provided between the guiding roller support and the impact guiding element; the rolling shafts are provided in the retainer; the thickness of the retainer is smaller than the guiding roller diameter; two parts of the guiding rollers higher than the retainer are respectively provided in the guiding roller support and the impact guiding element; a raceway is provided on the guiding roller support or the impact guiding element; the guiding roller is provided in the retainer and the raceway; the retainer and the raceway limit a rolling space of the guiding rollers; the guiding rollers roll against the raceway; the guiding roller support, the impact guiding element and the guiding rollers in the retainer and the raceway are matched closely to enable the impact guiding element to reciprocate with rolling friction; an impact direction of the impact guiding element is controlled by rolling friction; the impact guiding element and the impact head are connected, or integrated or separated; one end or two ends of the power impact element are provided with an damage-prevention mechanism; the damage-prevention mechanism comprises a rotating structure or a split structure; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type; the rotating structure or the split structure of the damage-prevention mechanism is matched with the guiding device; the power impact element drives the impact head to impact; an impact reactive damage force of the impact head on a coal wall or a rock wall is applied to the rotating structure or the split structure; the rotating structure is stressed to rotate, or the split structure isolates the reactive damage force in a split manner; a structure guiding buffering device is provided on the jacking device, or is provided between the jacking device and the frame, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; the structure guiding buffering device absorbs and buffers the impact reactive damage force generated by the impact head.

177. A wear-resistant impact mining machine according to claim 36, wherein the hydraulic impact drive device or the pneumatic impact drive device comprises a cylinder, a piston, and the power rollers; the cylinder, the piston and/or the power rollers comprise/comprises a power position-limiting structure; the power rollers are provided in the piston and in the cylinder; the power rollers support rolling fiction of the piston and the cylinder in the power position-limiting structure; the power position-limiting structure limits a moving space and position of the power rollers and/or the piston; the guiding device comprises the impact guiding element, the roller support and the guiding rollers; the impact guiding element, the rubbing body support and/or the guiding rollers comprise a guiding position-limiting structure; the guiding rollers support the impact guiding element to reciprocate along the rubbing body support in the guiding position-limiting structure; the guiding position-limiting structure limits a rolling space and position of the guiding rollers; the power position-limiting structure and the cylinder are connected, or separated, or integrated; or the power position-limiting structure and the piston are connected, or separated or integrated; or the power position-limiting structure and the power rollers are connected, or separated or integrated; or the guiding position-limiting structure and the rubbing body support are connected, or separated or integrated; or the guiding position-limiting structure and the impact guiding element are connected, or separated or integrated; or the guiding position-limiting structure and the guiding rollers are connected, or separated or integrated.

178. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the guiding device and the impact drive device; the impact drive device comprises the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device; the reciprocating impact part further comprises a supporting box or a supporting frame; the supporting box or

the supporting frame supports the guiding device; the impact drive device comprises a crank multi-throw eccentric shaft mechanism and a power output component; the crank multi-throw eccentric shaft mechanism comprises a multi-throw crank and the power impact element; the multi-throw crank comprises a power concentric shaft section, connecting handles and eccentric shafts; the power concentric shaft section, the connecting handles and the eccentric shafts are combined in a separated manner or integrated; one end of the power concentric shaft section of the multi-throw crank is connected with the power output component and the other end is provided with two or more connecting handles and eccentric shafts; two or more eccentric shafts are arranged radially at intervals along the power concentric shaft section to form angular difference; the power concentric shaft section of the multi-throw crank is installed on the supporting box or the supporting frame; two or more eccentric shafts of the multi-throw crank are connected with one end of two or more power impact elements; the other end of the power impact element is provided with an impact head; a damage-prevention mechanism is provided between the power impact element and the impact head; the damage-prevention mechanism is a split structure or a rotating structure; the guiding device comprises an external sleeve, an internal body and the guiding rollers; the internal body comprises an internal body upper element and an internal body lower element; the external sleeve is a frame-shaped external sleeve; the frame-shaped external sleeve comprises a frame-shaped external sleeve upper element and a frame-shaped external sleeve lower element; the frame-shaped external sleeve upper element and the frame-shaped external sleeve lower element comprise a reciprocating stroke section or a raceway; the guiding roller is provided between the internal body upper element and the frame-shaped external sleeve upper element and is provided between the internal body lower element and the frame-shaped external sleeve lower element; the frame-shaped external sleeve, the internal body and the guiding rollers provided in the reciprocating stroke section or in the raceway are matched closely so that the guiding rollers support the frame-shaped external sleeve to reciprocate with rolling friction and prevent the frame-shaped external sleeve from rotating; the external sleeve and the impact head are connected or integrated; two or more power impact elements alternatively drive the impact head to impact; the rotating structure of the damage-prevention mechanism is stressed to rotate, or the split structure isolates an impact reactive damage force in a split manner; the external sleeve, the internal body and the guiding rollers are matched closely to centralize an impact direction of the impact head; the power impact element does not guide the impact head and is not damaged by the damage force.

179. A wear-resistant impact mining machine according to claim 36, wherein the impact drive device comprises a rolling piston hydraulic impact drive device or a rolling piston pneumatic impact drive device; the rolling piston hydraulic impact drive device or the rolling piston pneumatic impact drive device comprises a cylinder, a piston, piston rollers, a control element and the power impact element; the piston rollers are provided in the piston to form a rolling piston; the rolling piston is provided in the cylinder; the rolling piston and the cylinder are supported by the piston rollers to have rolling friction; the control element controls a liquid or a gas to flow; the rolling piston is pushed by the liquid or the gas to reciprocate; one end of the power impact element is separated, connected or integrated with the piston; the other end of the power impact element is connected or separated with the impact head; one end or two ends of the power impact element are provided with a damage-prevention mechanism; the damage-prevention mechanism is provided as a rotating structure or a split structure; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type; the rotating structure or the split structure of the damage-prevention mechanism is matched with the guiding device; the rotating structure is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element drives the impact head to impact; an impact reactive damage force of the impact head on a coal wall or a rock wall is applied to the guiding device; the reciprocating impact part, or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor; the jacking device or the reciprocating impact part or the frame comprises a fixing support and a buffering support; or when the frame comprises the fixing support, the jacking device comprises the buffering support; or when the jacking device comprises the fixing support, the reciprocating impact part comprises the buffering support; or when the frame comprises the fixing support, the reciprocating impact part comprises the buffering

support; a buffering device is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; the buffering device comprises a structure guiding buffering device; the structure guiding buffering device comprises a buffering element and a buffering guiding element; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device; the structure guiding buffering device absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structure guiding buffering device absorbs and buffers an impact reactive force of the impact head while guiding a buffering direction, thus preventing the rotation power source element or the jacking device or the frame from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.

180. A wear-resistant impact mining machine according to claim 36, wherein the guiding device is combined with the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device to form two or more reciprocating impact parts; one end or two ends of the power impact element are provided with a damage-prevention mechanism; the damage-prevention mechanism comprises a rotating structure or a split structure; the rotating structure of the damage-prevention mechanism is provided as a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type; the rotating structure or the split structure of the damage-prevention mechanism is matched with the guiding device; the power impact element drives the impact head to impact; an impact reactive damage force of the impact head on a coal wall or a rock wall is applied to the rotating structure or the split structure; the rotating structure is stressed to rotate or the split structure isolates the impact reactive damage force in a split manner; the power impact element drives the impact head to impact; the impact reactive damage force of the impact head on the coal wall or the rock wall is applied to the guiding device, thus preventing the crank impact drive device, or the hydraulic impact drive device or the pneumatic impact drive device from being damaged by the impact reactive damage force; the guiding device centralizes an impact direction of the impact head, thus ensuring that the next impact of the impact head is applied to an objected to be mined; the reciprocating impact part, or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor; the jacking device or the reciprocating impact part or the frame comprises a fixing support and a buffering support; or when the frame comprises the fixing support, the jacking device comprises the buffering support; or when the jacking device comprises the fixing support, the reciprocating impact part comprises the buffering support; or when the frame comprises the fixing support, the reciprocating impact part comprises the buffering support; a buffering device is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; the buffering device comprises a rotation power buffering device and a structure guiding buffering device; the rotation power buffering device is provided between the rotation power source element and the rotation impact transmission element or is provided in the rotation impact transmission element; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering device or a belt buffering device; the sliding stroke spline shaft housing buffering device comprises a spline shaft and a spline housing; a sliding reciprocating stroke section is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the belt buffering device comprises a driving pulley, a driven pulley and a belt; the driving pulley is fixed on the fixing support; the driving pulley is connected with a drive shaft of the electric machine, the hydraulic motor, or the pneumatic motor; the driven pulley is provided on the buffering support; the belt is provided on the driving pulley and the driven pulley; the driving pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force; the belt buffering

device prevents the electric machine, the hydraulic motor, or the pneumatic motor from being damaged; the structure guiding buffering device comprises a buffering element and a buffering guiding element; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device; the structure guiding buffering device absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering device or the belt buffering device to absorb and buffer an impact reactive force of the reciprocating impact part and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.

181. A wear-resistant impact mining machine according to claim 36, wherein the impact drive device comprises a crank impact drive device; the crank impact drive device comprises the power impact element; the guiding device and the crank impact drive device are combined into two or more reciprocating impact parts; two or more reciprocating impact parts are provided at a front part of the jacking device or the frame; the guiding device comprises the guiding rollers, the guiding roller support and the impact guiding element; the guiding roller is provided between the guiding roller support and the impact guiding element; the reciprocating impact part comprises a supporting box; the crank impact driving device comprises a crank component; the crank component drives the power impact element; the guiding device and the crank component are combined and provided in the supporting box; two ends of the impact guiding element extending out of the supporting box are provided with impact heads; or one end of the impact guiding element is provided with an impact head and the other end is provided with a counterweight element for preventing the impact head from being damaged with the guiding device, the impact drive device and/or the machine body due to gravity unbalance or one end of the impact guiding element is provided with an impact head; an end of two or more power impact elements extending out of the supporting box is connected or separated with the impact head; the supporting box supports a crank component, the guiding device and the impact head; the supporting box is provided at a front part of the jacking device or the frame; a guiding roller position-limiting structure is provided on the guiding roller support or the impact guiding element; the guiding roller position-limiting structure limits a rolling space of the guiding rollers; the guiding rollers, the guiding roller support and the impact guiding element are matched closely so that the guiding rollers provided in the guiding roller position-limiting structure support through rolling friction the impact guiding element to reciprocate and control an impact direction of the impact guiding element; one end or two ends of the power impact element are provided with a damage-prevention mechanism; the damage-prevention mechanism comprises a rotating structure or a split structure; the rotating structure of the damage-prevention mechanism comprises a joint bearing, or a turning joint, a ball cage universal joint, a cross universal joint, a ball-end catching groove type, or an arc-shaped catching groove type; the rotating structure or the split structure of the damage-prevention mechanism is matched with the guiding device; the power impact element drives the impact head to impact; an impact reactive damage force of the impact head on a coal wall or a rock wall is applied to the rotating structure or the split structure; the rotating structure is stressed to rotate or the split structure isolates the reactive damage force in a split manner; the guiding device centralizes an impact direction of the impact head; the power impact element drives the impact head; the impact reactive damage force of the impact head on the coal wall or the rock wall is applied to the guiding device, thus preventing the impact drive device from being damaged by the impact reactive damage force; the reciprocating impact part, or the jacking device or the frame comprises a rotation power source element and a rotation impact transmission element; or when the frame comprises the rotation power source element, the jacking device comprises the rotation impact transmission element; or when the jacking device comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; or when the frame comprises the rotation power source element, the reciprocating impact part comprises the rotation impact transmission element; the rotation power source element comprises an electric machine, or a hydraulic motor, or a pneumatic motor; the jacking device or the reciprocating impact part or the frame comprises a fixing support and a buffering support; or when the frame comprises the fixing support, the jacking device comprises the buffering support; or when the jacking device comprises the fixing support, the reciprocating impact part comprises the buffering support; or when the frame comprises the fixing support, the reciprocating impact part

comprises the buffering support; a buffering device is provided between the frame and the jacking device, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the reciprocating impact part; the buffering device comprises a rotation power buffering device and a structure guiding buffering device; the rotation power buffering device is provided between the rotation power source element and the rotation impact transmission element or is provided in the rotation impact transmission element; the rotation power buffering device comprises a sliding stroke spline shaft housing buffering device or a belt buffering device; the sliding stroke spline shaft housing buffering device comprises a spline shaft and a spline housing; a sliding reciprocating stroke section is provided between the spline shaft and the spline housing; when impacted, the sliding reciprocating stroke section slides in a reciprocating manner to absorb an impact reactive force; the belt buffering device comprises a driving pulley, a driven pulley and a belt; the driving pulley is fixed on the fixing support; the driving pulley is connected with a drive shaft of the electric machine, the hydraulic motor, or the pneumatic motor; the driven pulley is provided on the buffering support; the belt is provided on the driving pulley and the driven pulley; the driving pulley moves as the buffering support is impacted; the belt absorbs an impact reactive force; the belt buffering device prevents the electric machine, the hydraulic motor, or the pneumatic motor from being damaged; the structure guiding buffering device comprises a buffering element and a buffering guiding element; the buffering element is provided between the frame and the reciprocating impact part, or is provided between the fixing support and the buffering support, or is provided between the jacking device and the reciprocating impact part, or is provided between the frame and the jacking device; the buffering guiding element is provided on the frame and the reciprocating impact part, or is provided on the fixing support and the buffering support, or is provided on the jacking device and the reciprocating impact part, or is provided on the frame and the jacking device; the structure guiding buffering device absorbs an impact reactive force through the buffering element while controlling a buffering direction through the buffering guiding element; the structure guiding buffering device is matched with the sliding stroke spline shaft housing buffering device or the belt buffering device to absorb and buffer an impact reactive force of the reciprocating impact part and guide a buffering direction, thus preventing the rotation power source element or the jacking device or the frame from being damaged by oscillating non-directionally during buffering and ensuring that an impact direction of the impact head faces an object to be mined.

182. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the guiding device, the impact drive device, the supporting box, and the impact head; the supporting box supports the guiding device; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device comprises the power impact element; the power impact element is provided in the supporting box; the power impact element and the impact head are connected, separated or integrated; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure; the guiding device comprises the guiding roller support, the guiding rollers, and the impact guiding element; the guiding roller support comprises a raceway; the impact guiding element comprises a raceway; the guiding rollers comprise rollers; the rollers roll against the raceway; the impact guiding element is supported by the rollers to roll; the power impact element drives the impact head to impact; the rotating structure the damage-prevention mechanism is stressed to rotate or the split structure isolates a reactive damage force in a split manner; the guiding roller support, the impact guiding element and the rollers provided in the raceway are matched closely to centralize an impact direction of the impact head and prevent the impact head from rotating; the power impact element does not guide the impact head and is not damaged by the damage force.

183. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the guiding device and the impact drive device; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device comprises the power impact element; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure; the guiding device comprises the guiding roller support, and the impact guiding element; the guiding roller support comprises a guiding roller support upper element, and a guiding roller support lower element; the impact guiding element is a U-shaped impact guiding element; the U-shaped impact guiding element comprises an impact guiding element upper element and a impact guiding element lower element; a raceway is provided in the

guiding roller support upper element, and the guiding roller support lower element; or a raceway is provided in the impact guiding element upper element and the impact guiding element lower element; or a raceway is provided in the guiding roller support upper element, the guiding roller support lower element, the impact guiding element upper element and the impact guiding element lower element; the guiding roller is provided between the guiding roller support upper element and the impact guiding element upper element, and is provided between the guiding roller support lower element and the impact guiding element lower element and is provided in the raceway; the guiding roller provided in the raceway, the U-shaped impact guiding element and the guiding roller support are matched closely so that the guiding roller supports the U-shaped impact guiding element to reciprocate with rolling friction and control a reciprocating direction of the U-shaped impact guiding element and centralize an impact direction of the impact head; the U-shaped impact guiding element and the impact head are connected, separated or integrated; the power impact element and the impact head are connected or separated; the power impact element drives the impact head to impact; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element does not guide the impact head and is not damaged by the damage force.

184. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the guiding device and the impact drive device; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device comprises the power impact element; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure; the guiding device comprises an external sleeve, an internal body and the guiding rollers; the internal body comprises an internal body upper element and an internal body lower element; the external sleeve is a frame-shaped external sleeve; the frame-shaped external sleeve comprises a frame-shaped external sleeve upper element and a frame-shaped external sleeve lower element; the guiding roller is provided between the internal body upper element and the frame-shaped external sleeve upper element and is provided between the internal body lower element and the frame-shaped external sleeve lower element; the frame-shaped external sleeve, the internal body and the guiding rollers are matched closely so that the guiding roller support supports the frame-shaped external sleeve to reciprocate with rolling friction and control a reciprocating direction of the frame-shaped external sleeve and centralizes an impact direction of the impact head; the frame-shaped external sleeve and the impact head are connected, separated or integrated; the power impact element and the impact head are connected or separated; the power impact element drives the impact head to impact; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element does not guide the impact head and is not damaged by the damage force.

185. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the guiding device and the impact drive device; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device comprises the power impact element; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure; the guiding device comprises an external sleeve, an internal body and the guiding rollers; the external sleeve is a cylindrical external sleeve; the guiding roller is provided between the internal body and the cylindrical external sleeve; the guiding rollers, the cylindrical external sleeve and the internal body are matched closely so that the guiding rollers support the cylindrical external sleeve to reciprocate with rolling friction and control a reciprocating direction of the cylindrical external sleeve; the cylindrical external sleeve and the impact head are connected, separated or integrated; the power impact element and the impact head are connected, separated or integrated; the power impact element drives the impact head to impact; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element does not guide the impact head and is not damaged by the damage force.

186. A wear-resistant impact mining machine according to claim 36, wherein the reciprocating impact part comprises the guiding device, the impact drive device, a supporting box, and the impact head; the supporting box supports the guiding device; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device comprises the power im-

pact element; the power impact element is provided in the supporting box; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure; the guiding device comprises a wear-resistant traveling wheel; the wear-resistant traveling wheel comprises a rolling wheel, the guiding roller support and the impact guiding element; the rolling wheel is provided on the guiding roller support; the power impact element and the impact guiding element are connected, separated or integrated; the power impact element is provided with a bump, a recess, a V groove or a curve locked with the rolling wheel; the rolling wheel is provided at one side of the power impact element or is provided in the power impact element; the rolling wheel supports the power impact element to impact in a reciprocating manner with rolling friction while having a rolling guiding function; the power impact element drives the impact head to impact; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the impact guiding element, the guiding roller support and the rolling wheel are matched closely to centralize an impact direction of the impact head; the power impact element does not guide the impact head and is not damaged by the damage force.

187. A wear-resistant impact mining machine according to claim 36, wherein the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device comprises the power impact element; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure; the guiding device comprises a linear bearing; the impact guiding element is provided on the linear bearing; the power impact element and the impact head are connected or separated; the power impact element drives the impact head to impact in a reciprocating manner; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates an impact reactive damage force in a split manner; the power impact element does not guide the impact head and the guiding device centralizes an impact direction of the impact head.

188. A wear-resistant impact mining machine according to claim 36, wherein it comprises a box, the guiding device, the impact drive device and the impact head; the box supports the guiding device; the guiding device comprises the impact guiding element, the rubbing body, and the rubbing body support; the rubbing body comprises the roller and the suspender; the roller comprises the guiding roller and/or the power roller; the suspender comprises the guiding suspender and/or the power suspender; the suspender comprises magnetic suspender, liquid suspender or gas suspender; the guiding support comprises the guiding roller support or the guiding suspender support; the box and the rubbing body support are separated, connected in a separated manner or integrated; an end of the impact guiding element extending out of the box is connected with the impact head; one end of the impact guiding element is provided with an impact head or two ends are provided with impact heads or one end is provided with an impact head while the other end is provided with a counterweight element; the impact guiding element and the impact head are connected or integrated; the impact drive device comprises the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device; the crank impact drive device, the hydraulic impact drive device or the pneumatic impact drive device or the solid flowing impact drive device comprises the power impact element and the power support; the box and the power support are connected in a separated manner or integrated; the power support and the guiding support are separated, connected in a separated manner or integrated; the power support comprises the power roller support or the power suspender support; the impact guiding element and the power impact element are separated, connected in a split manner or integrated; the power impact element is provided in the box; the power impact element and the impact head are moveably connected or separated; a damage-prevention mechanism is provided at one end or two ends of the power impact element; the damage-prevention mechanism comprises a rotating structure and a split structure; the power impact element drives the impact head to impact; an impact damage force is applied on the damage-prevention mechanism; the rotating structure of the damage-prevention mechanism is stressed to rotate or the split structure isolates the impact reactive damage force in a split manner; the rubbing body is provided between the guiding support and the impact guiding element to form the guiding device; the rubbing body, the rubbing body support and the impact guiding element are matched closely to support impact head to impact through rolling friction or suspension friction; the guiding device centralizes an impact direction of the impact head, thus preventing the impact drive device from being damaged by a damage force and an impact reactive force.

189. A wear-resistant impact mining machine according to claim 36, wherein the jacking device comprises a rocker arm lifting mechanism; a front part of the rock-

er arm lifting mechanism is provided with a supporting box; the crank impact drive device comprises a transmission gear; two sides of the transmission gear are provided with crank connecting rods; a crank connecting rod at one side at least drives one impact head to impact; the crank connecting rods at two sides of the transmission gear impact simultaneously or impact alternatively; two or more ends of the supporting box are provided with the guiding support, the impact guiding element and the rubbing body; the rubbing body is provided between the guiding support and the impact guiding element to form a multi-point supporting impact head structure; the supporting box and the guiding support are connected in a separated manner or integrated; two or more impact guiding elements extend out of the box to connect the impact head; a connecting rod is connected, separated or integrated with the impact head; a damage-prevention mechanism is provided at one end or two ends of the connecting rod; the connecting rod drives the impact head to reciprocate; two or more impact guiding elements centralize an impact direction of the impact head.

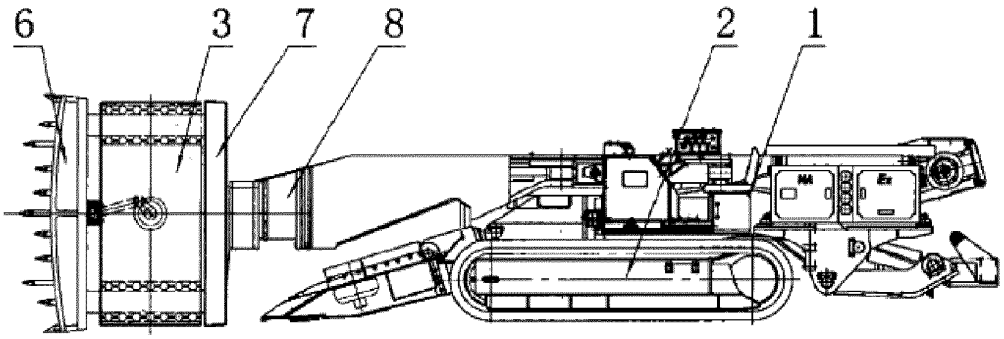


Fig. 1

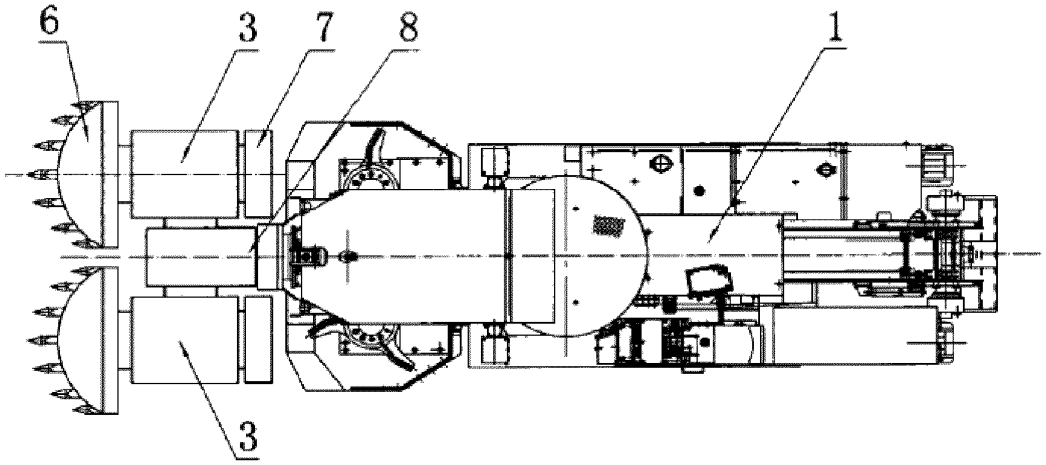


Fig. 2

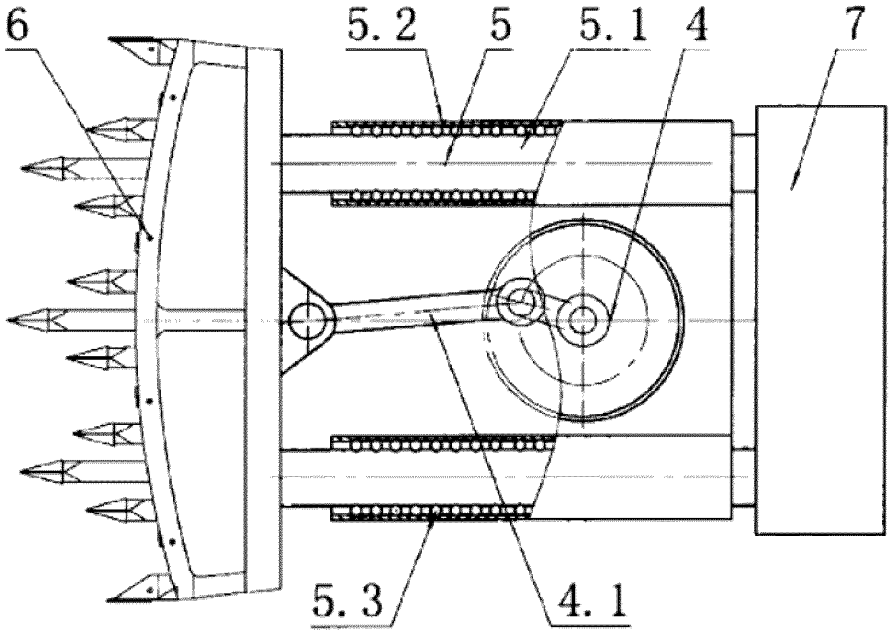


Fig. 3

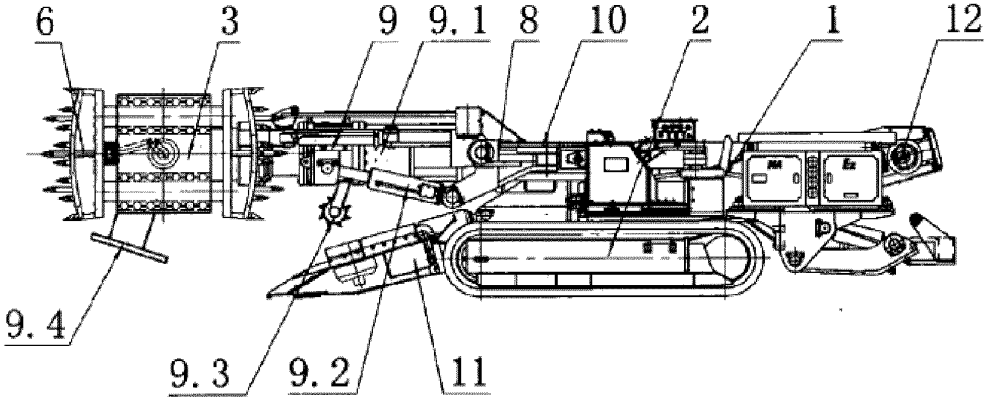


Fig. 4

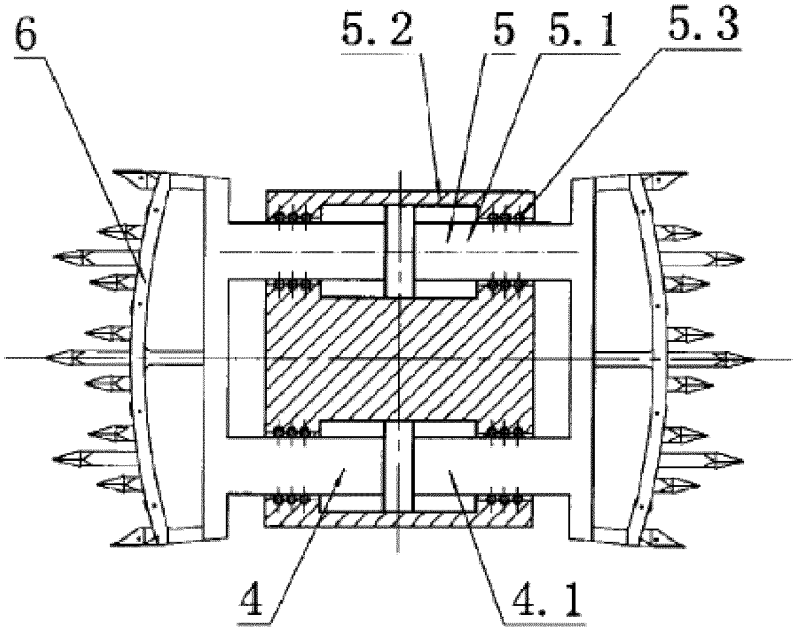


Fig. 5

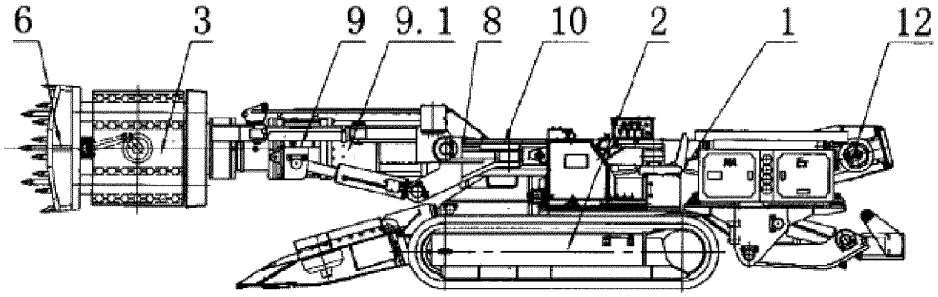


Fig. 6

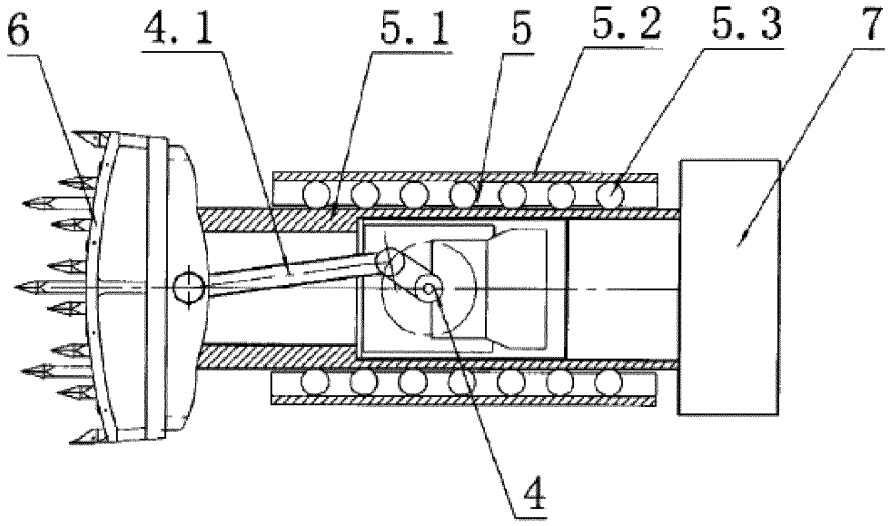


Fig. 7

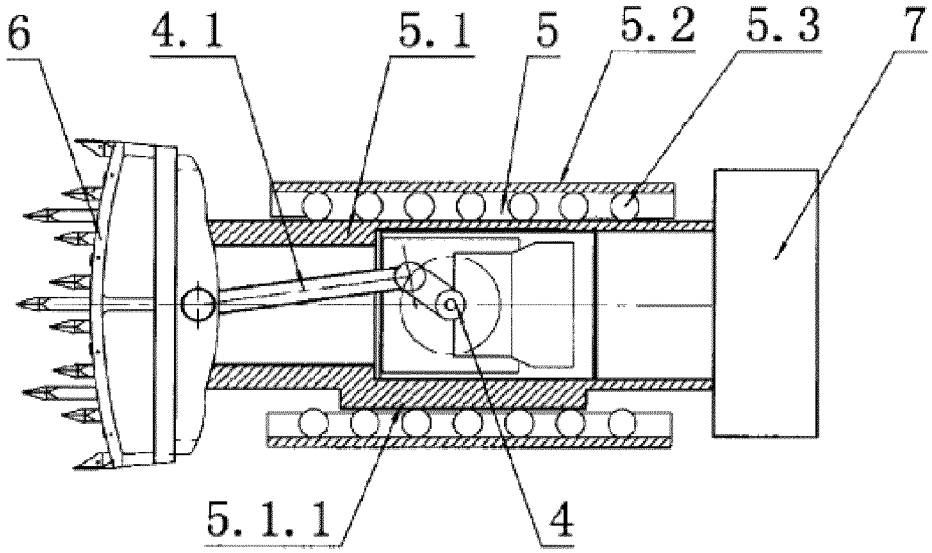


Fig. 8

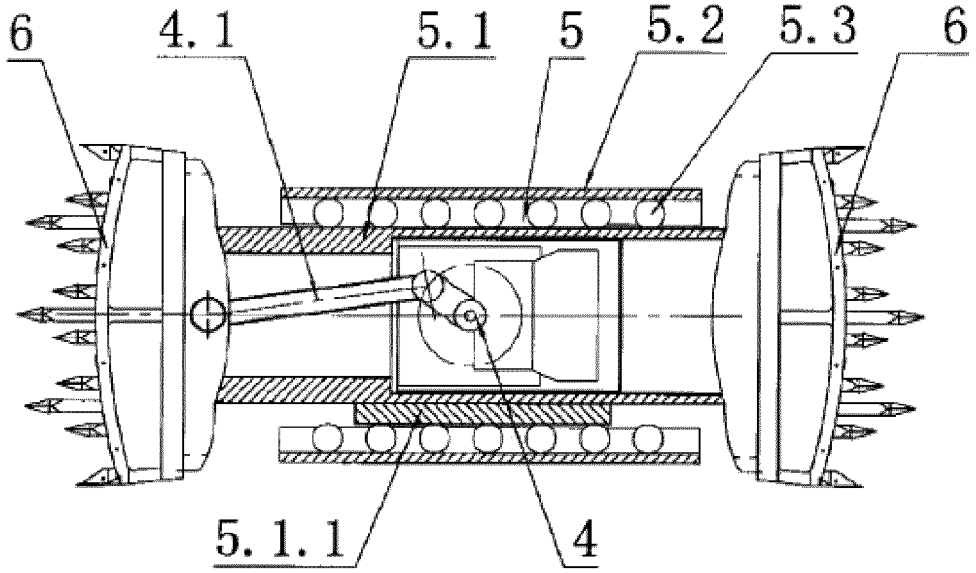
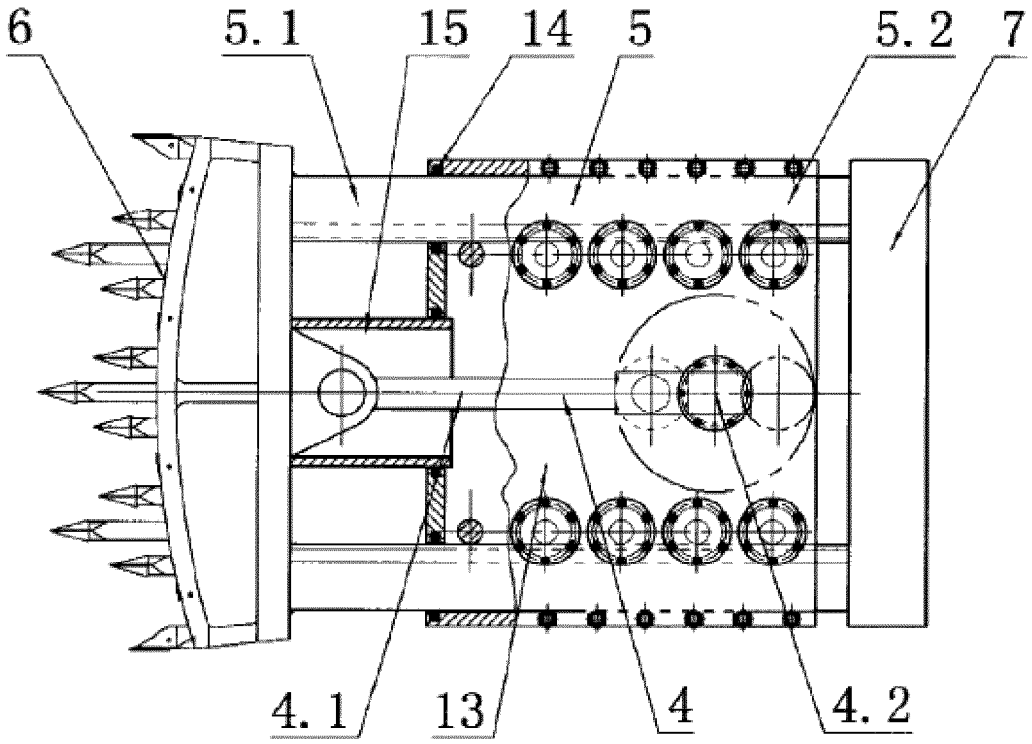


Fig. 9



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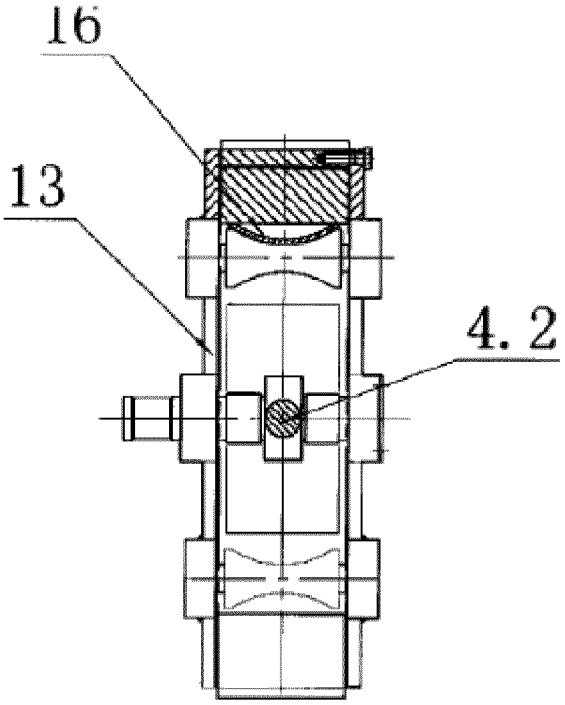

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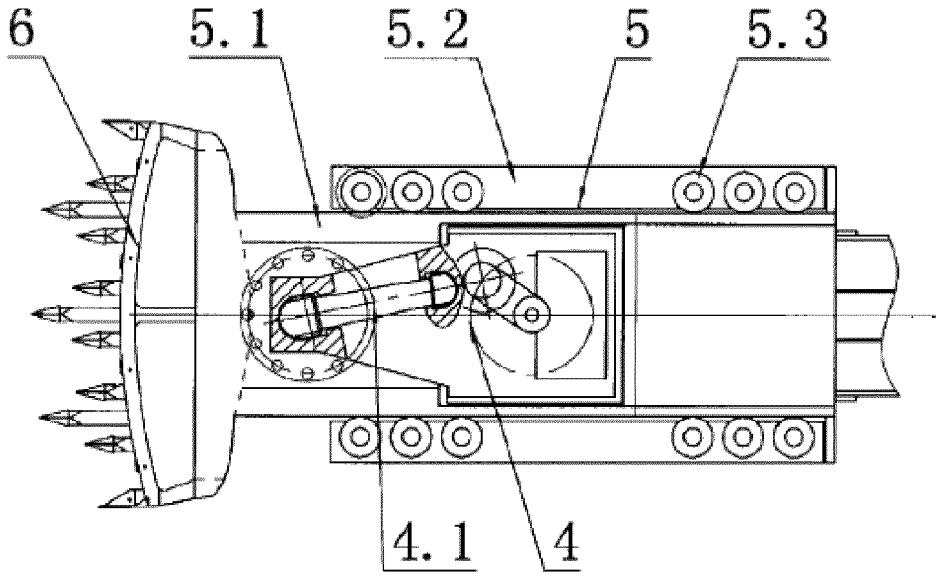

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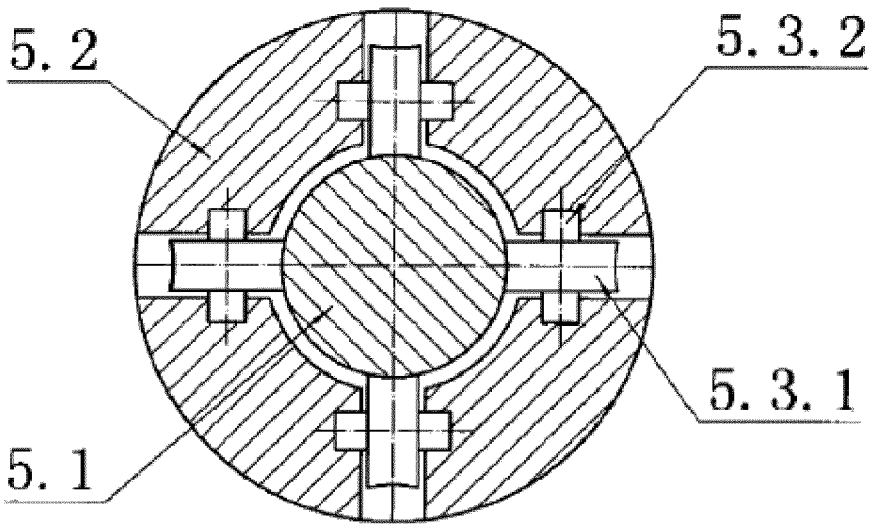

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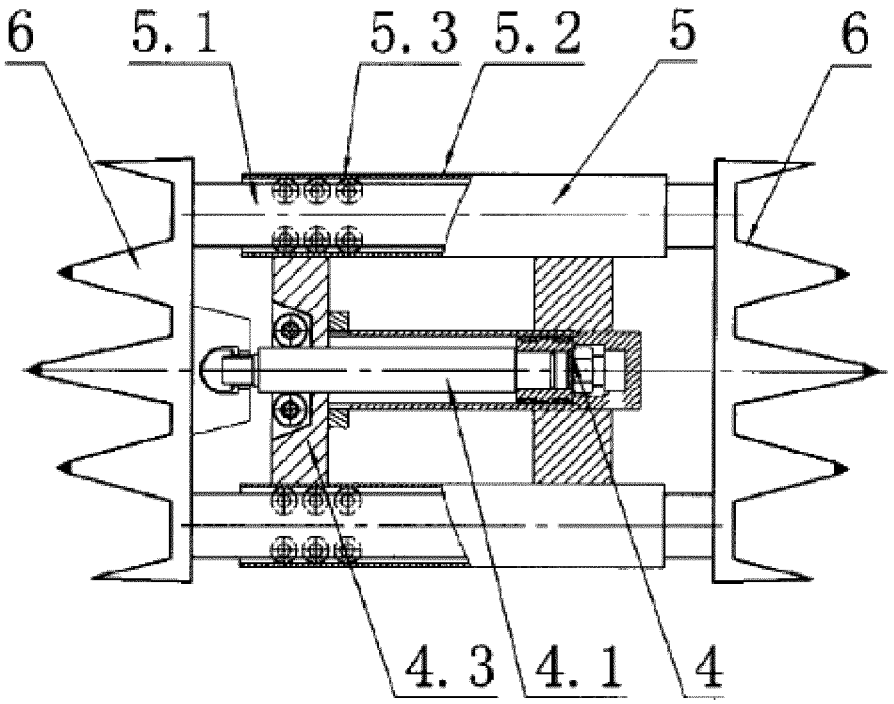

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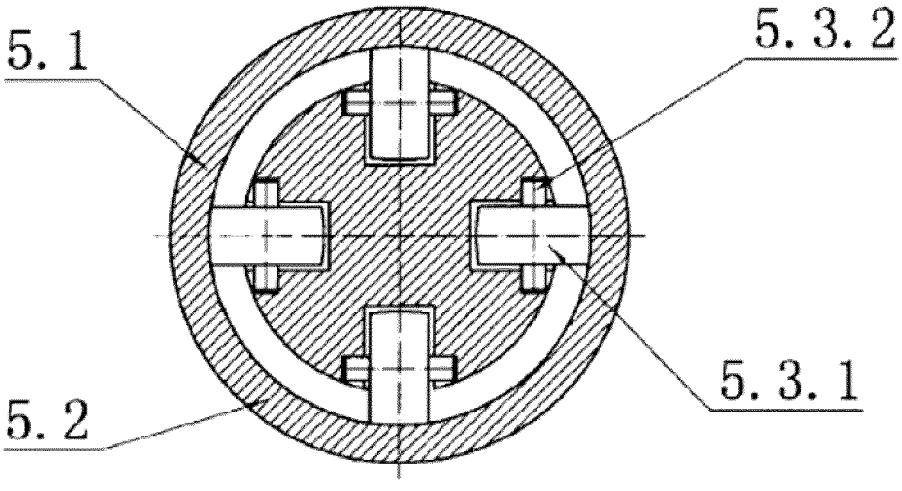

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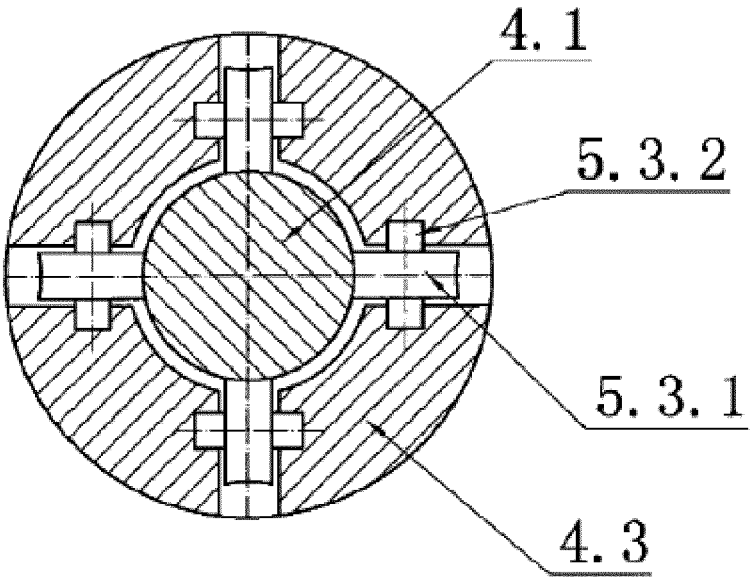

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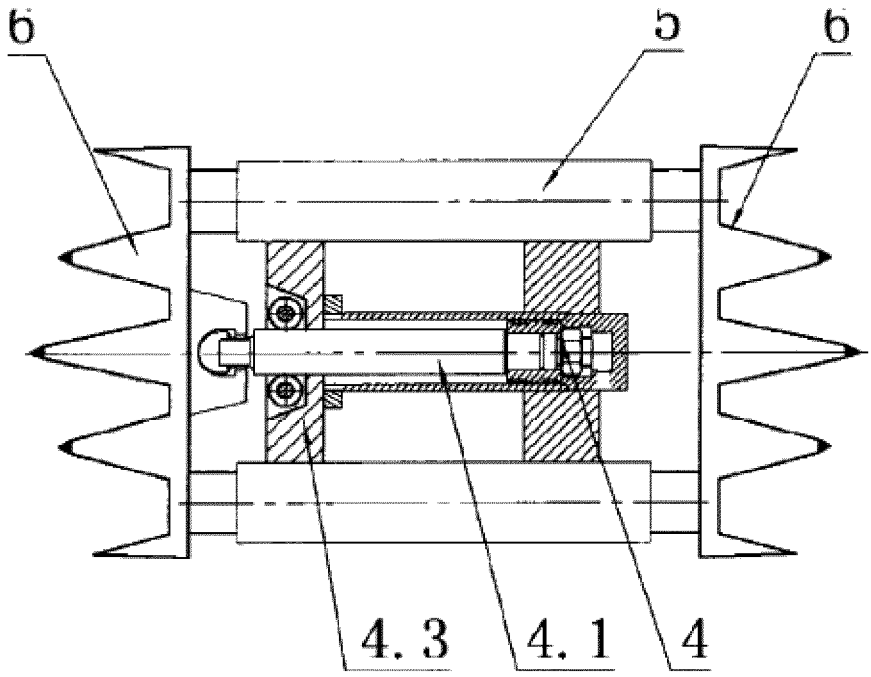

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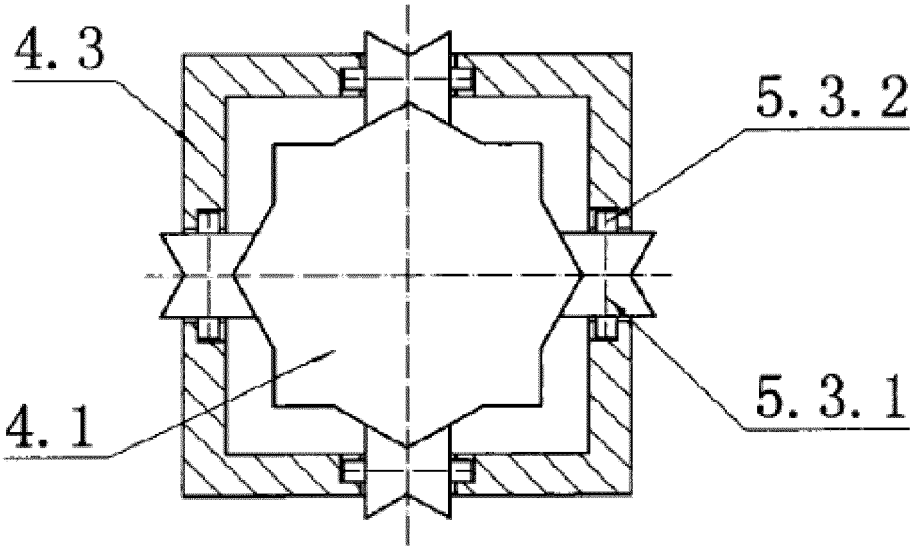

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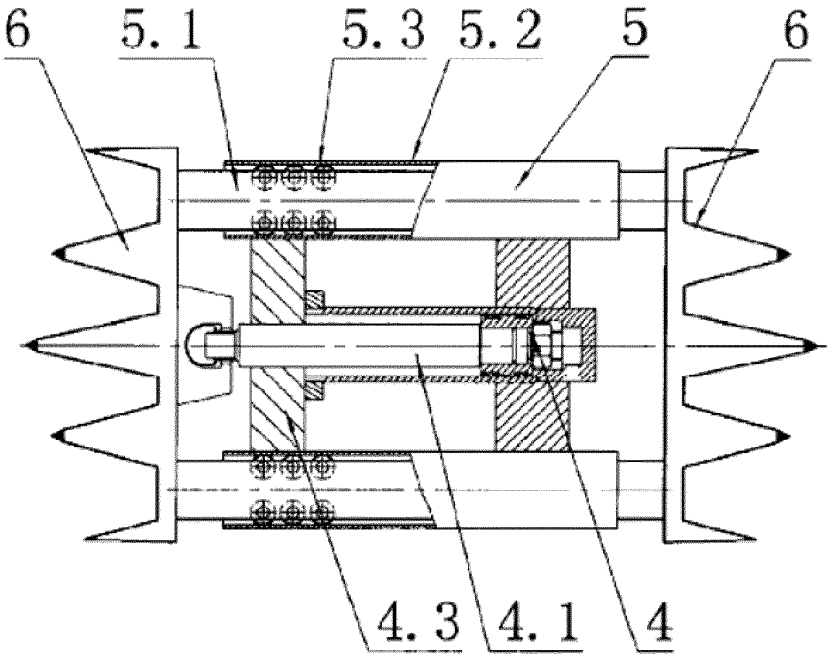

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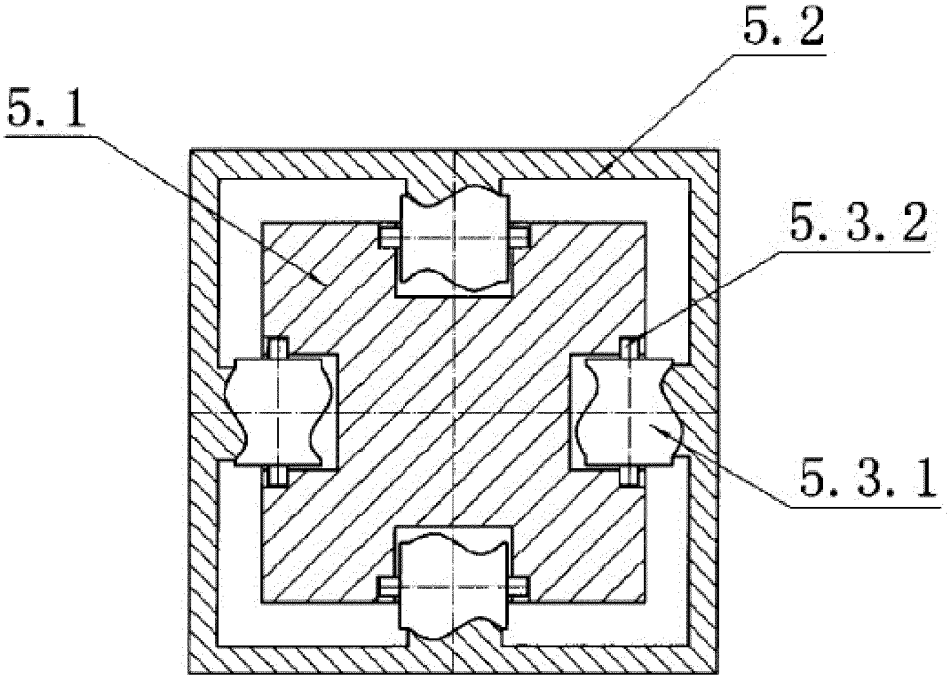

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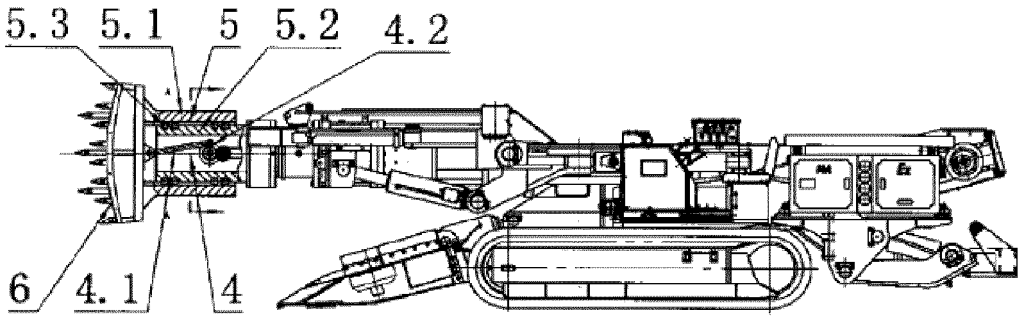

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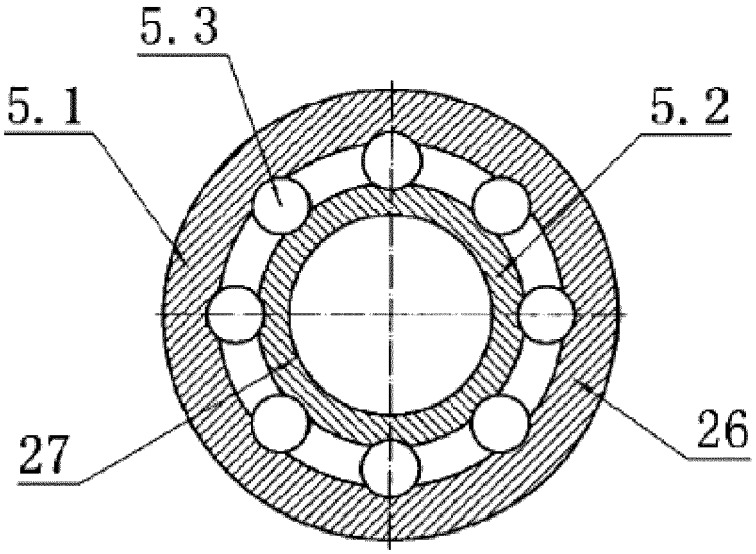

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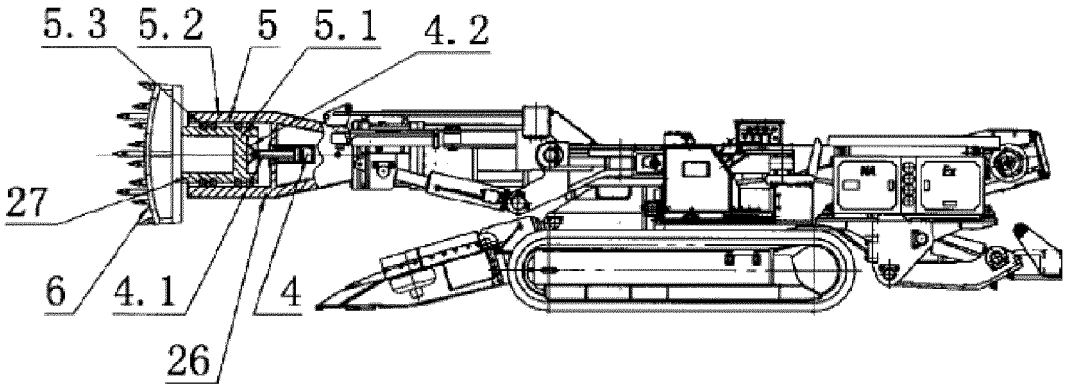

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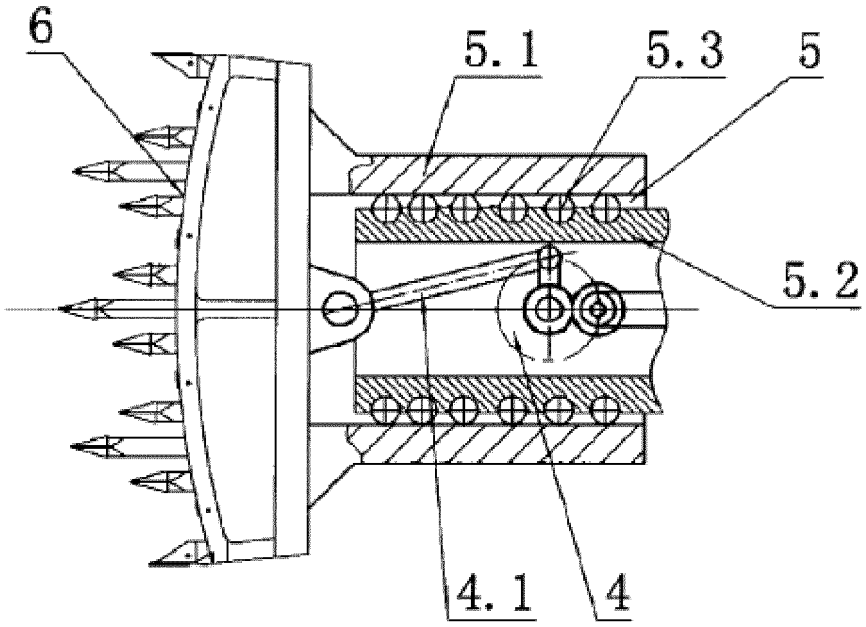

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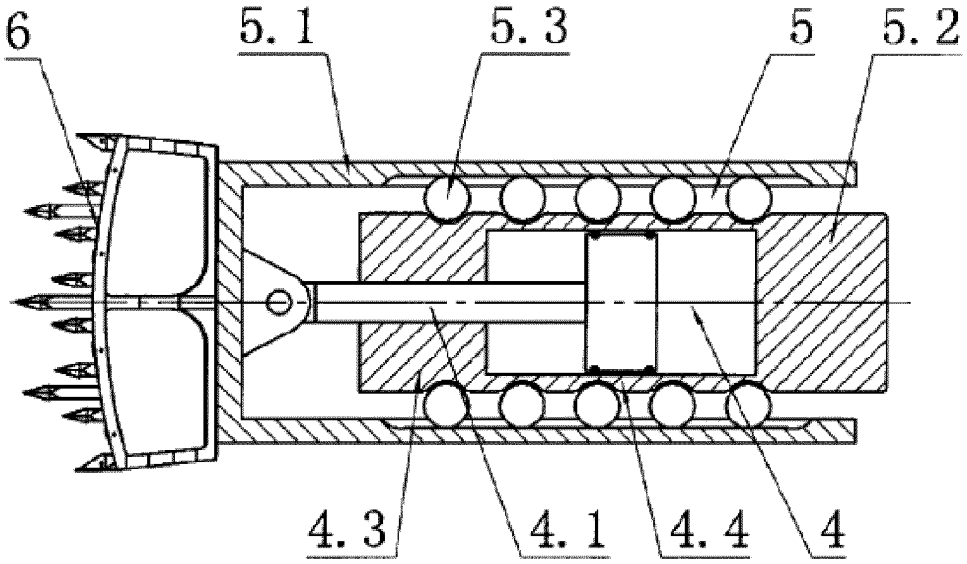

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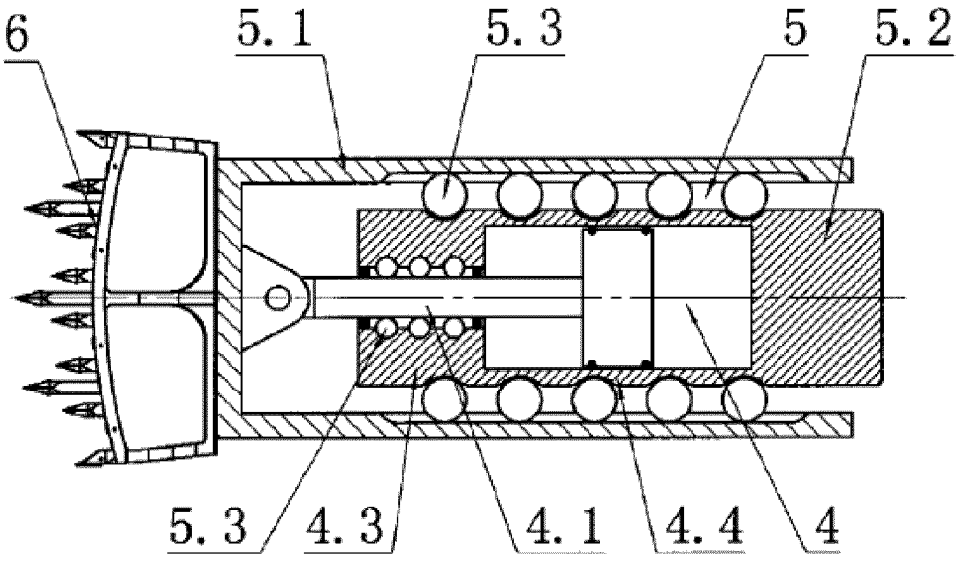

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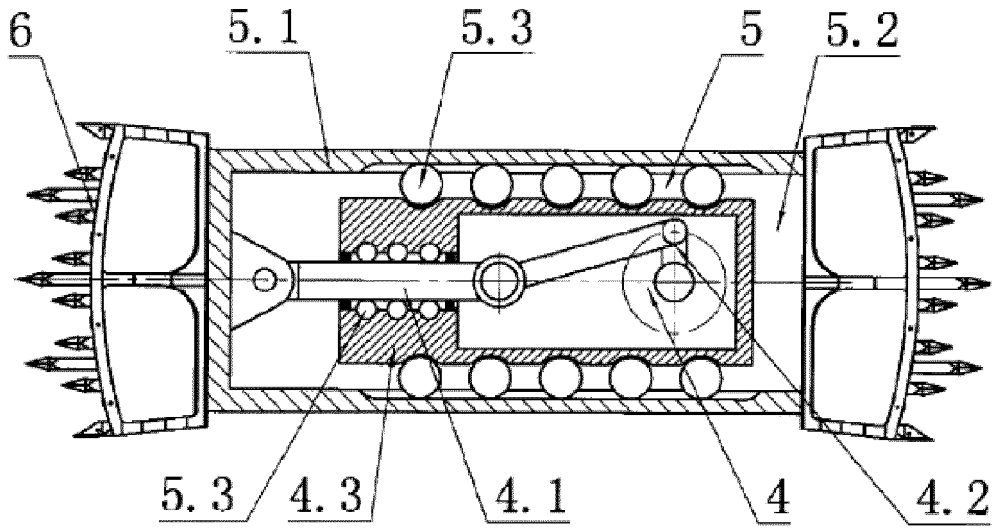

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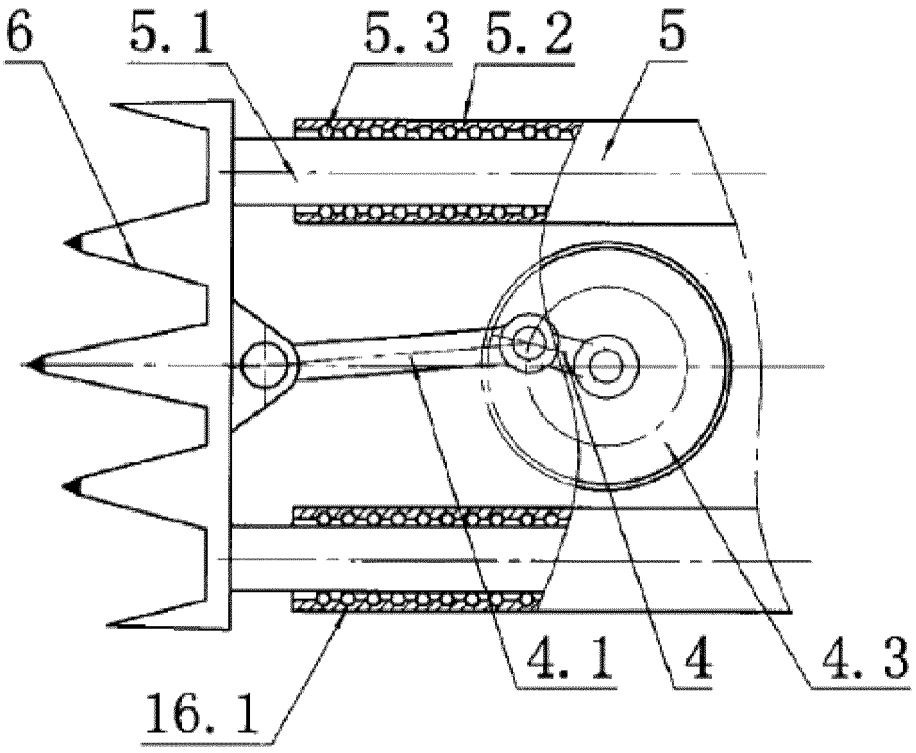

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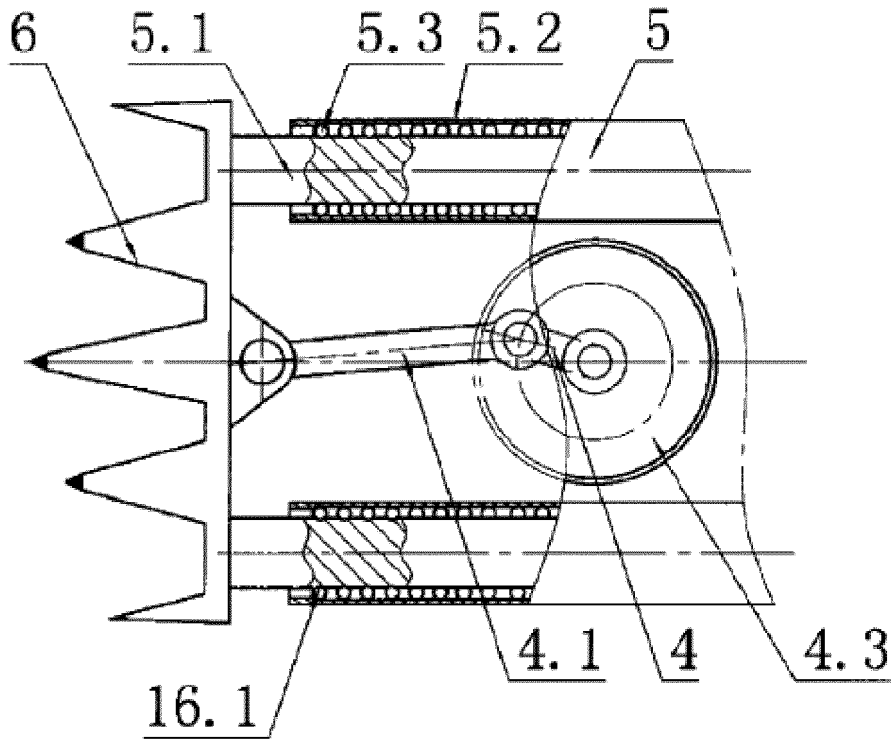

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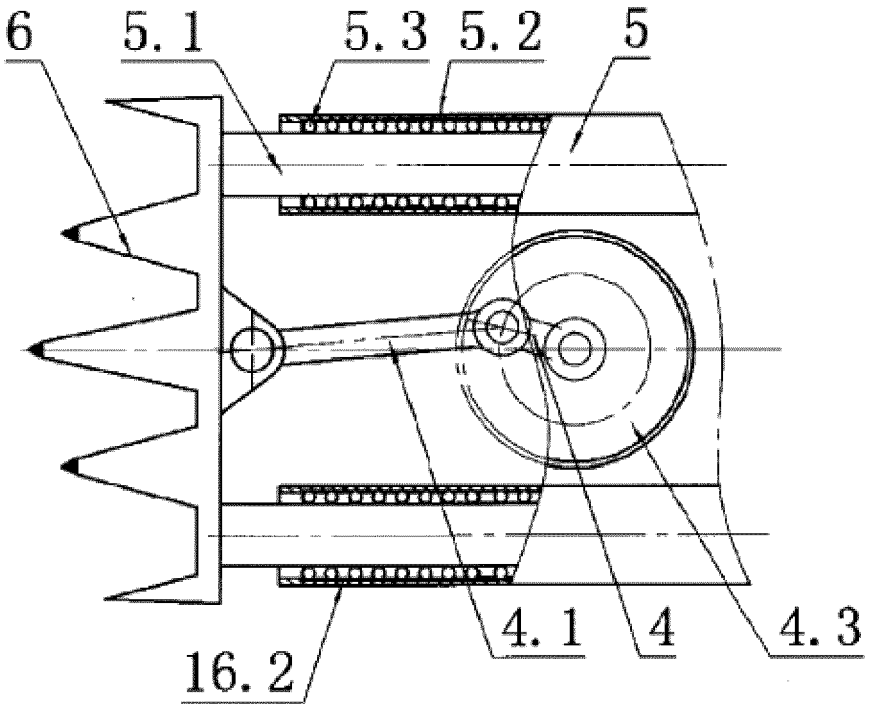

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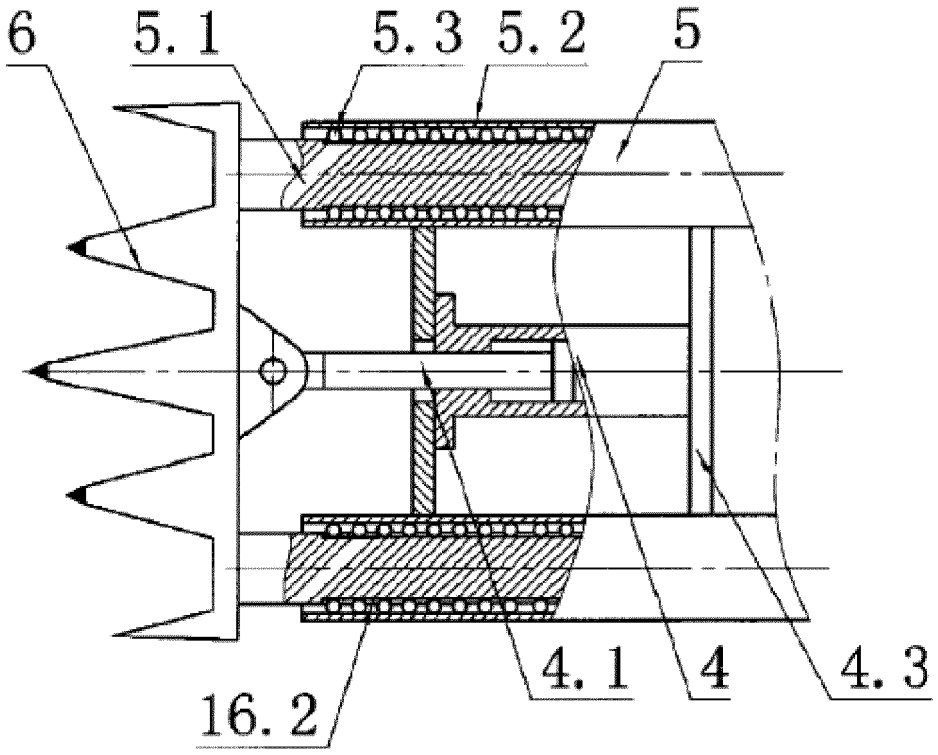

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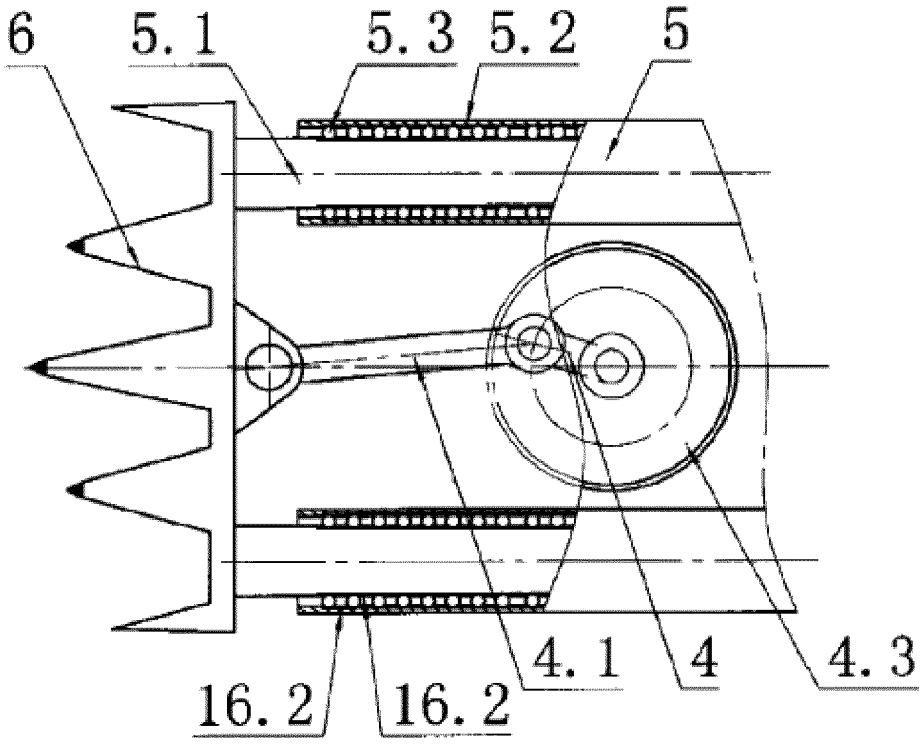

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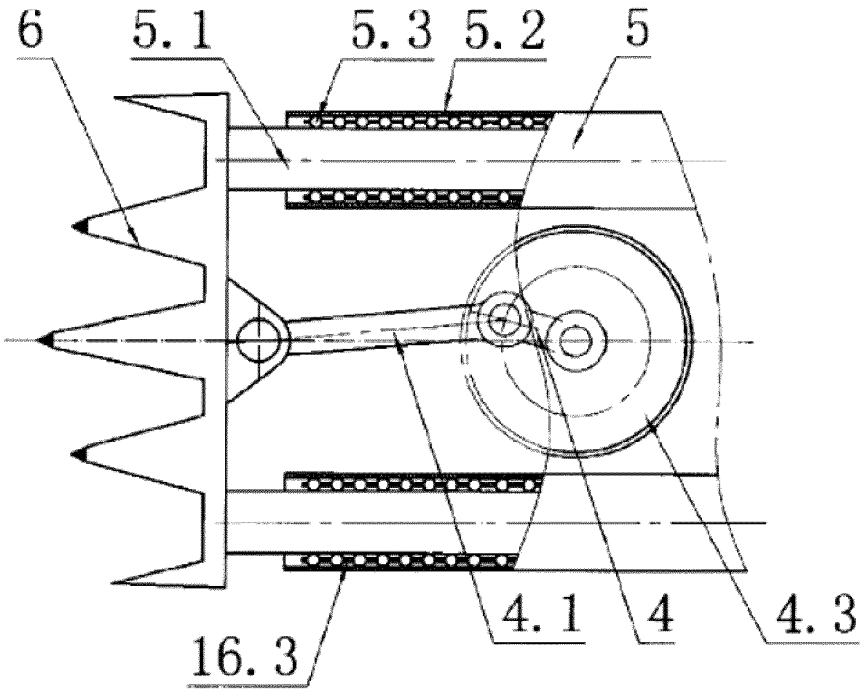

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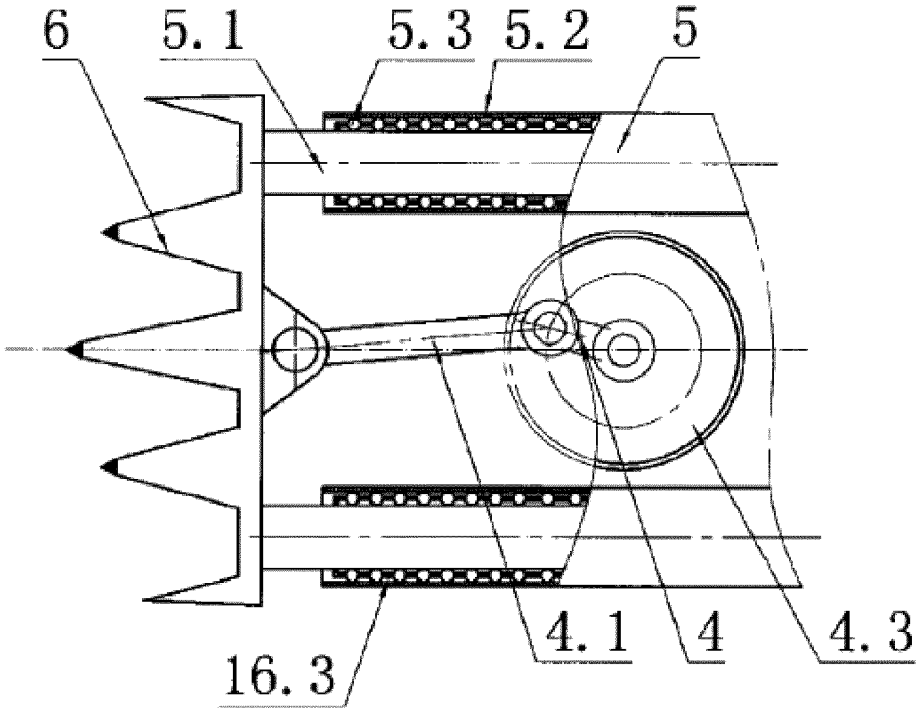

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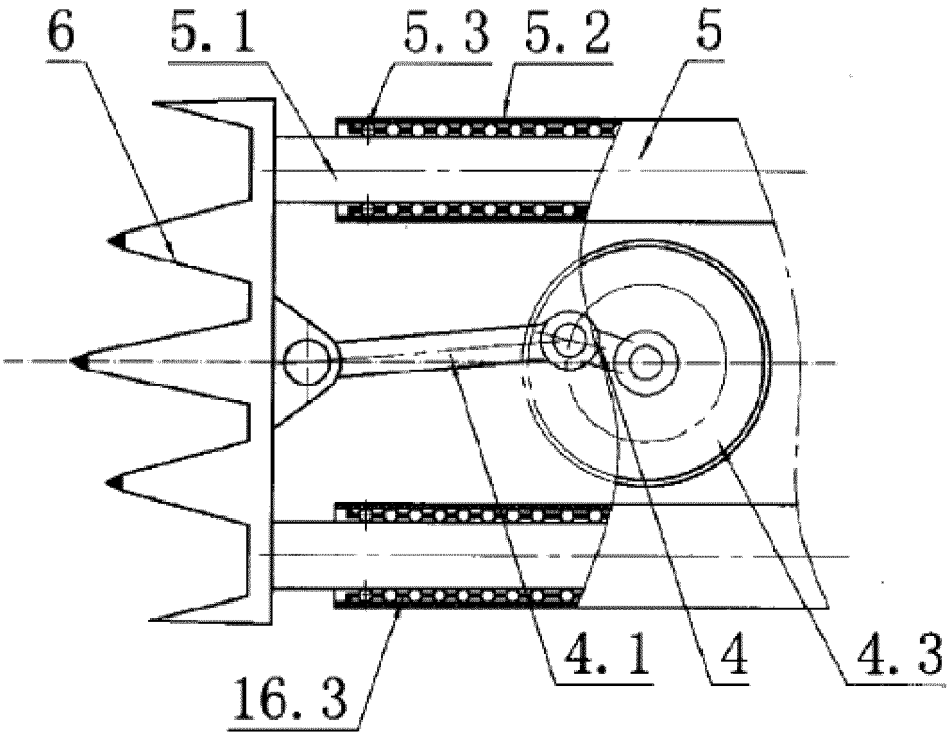

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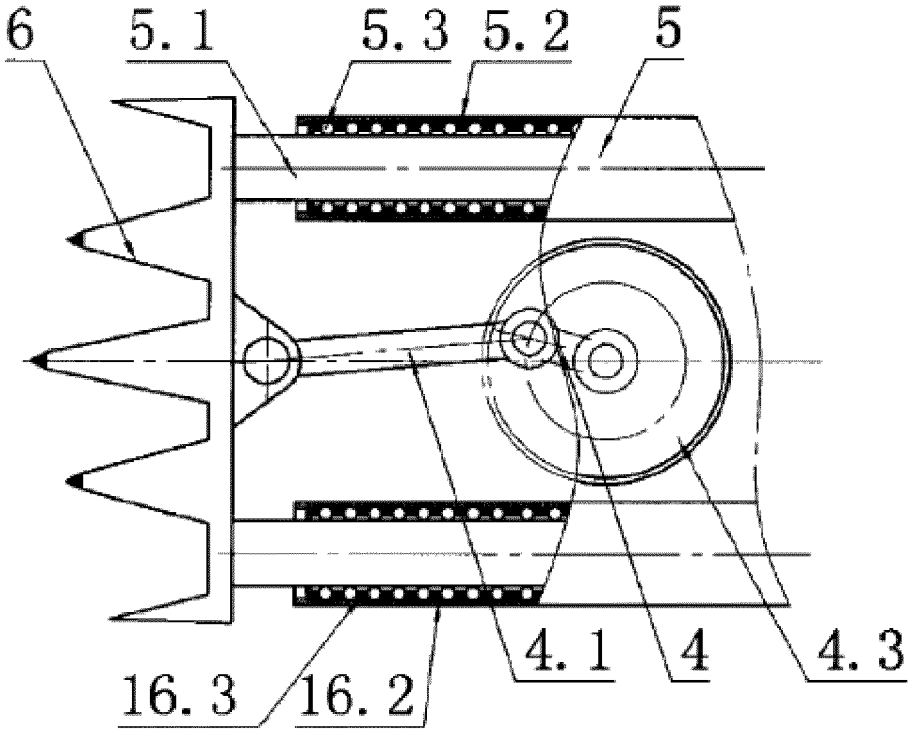

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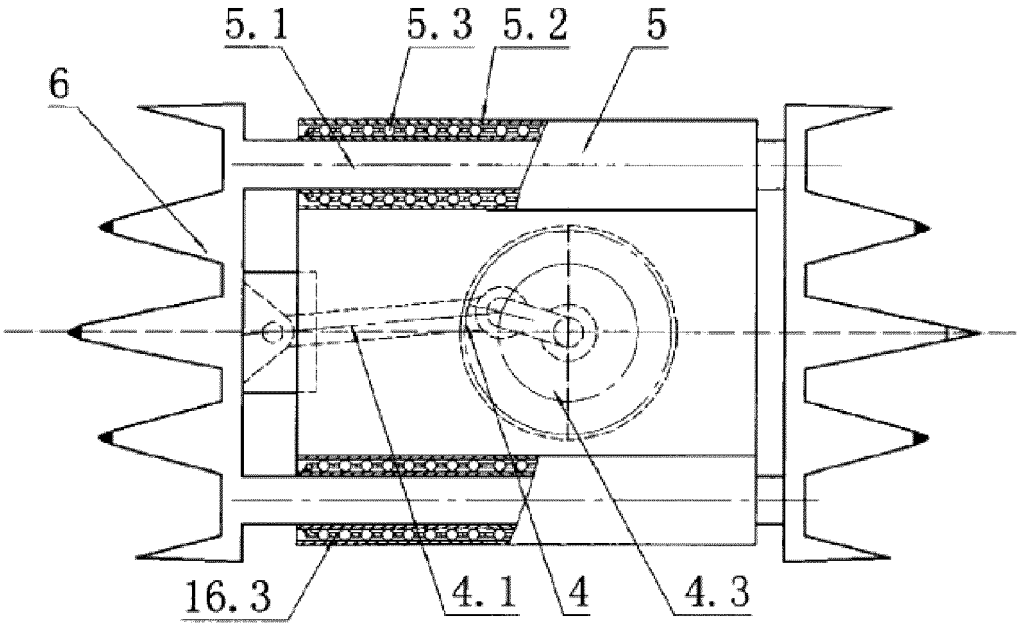

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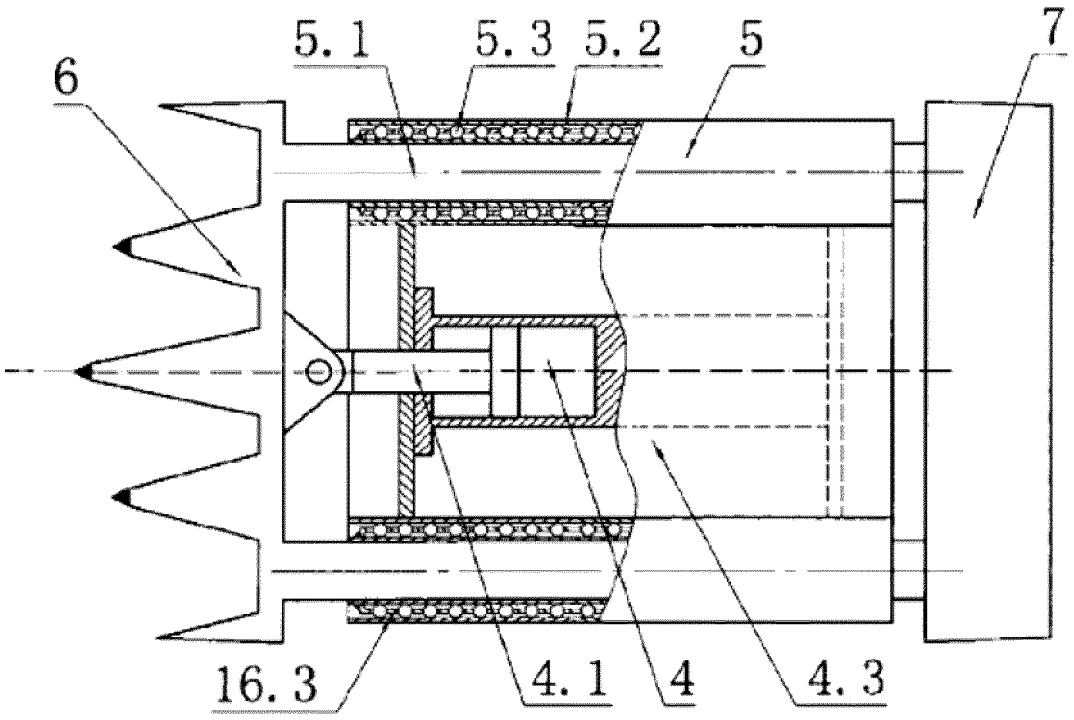

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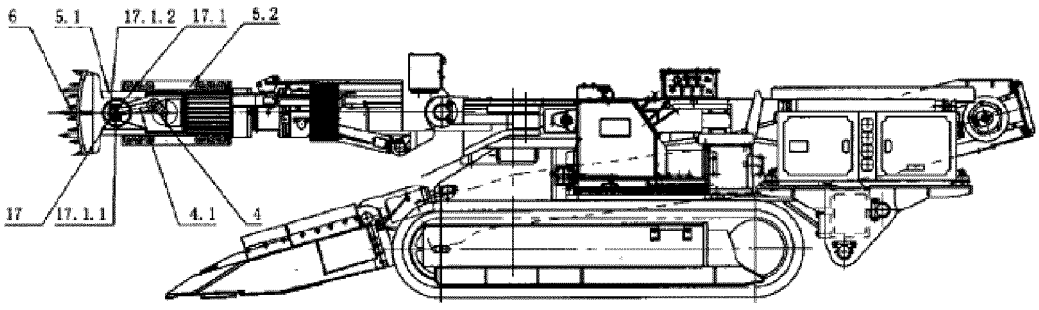

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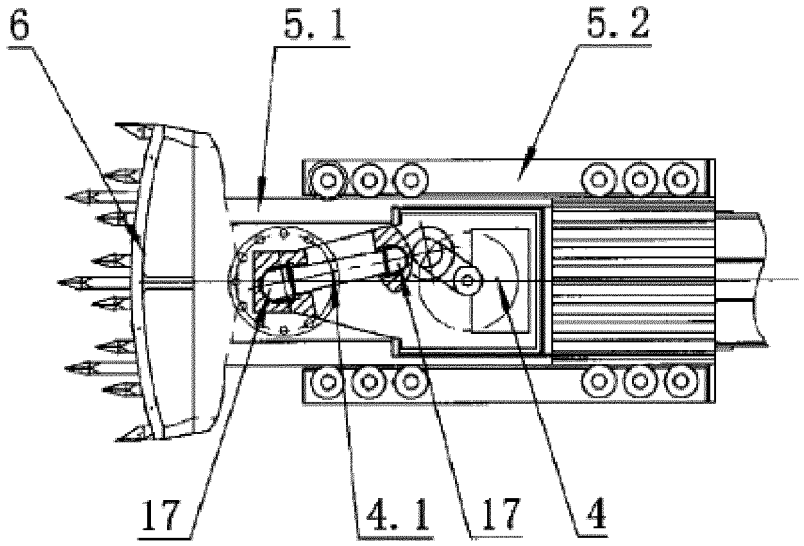

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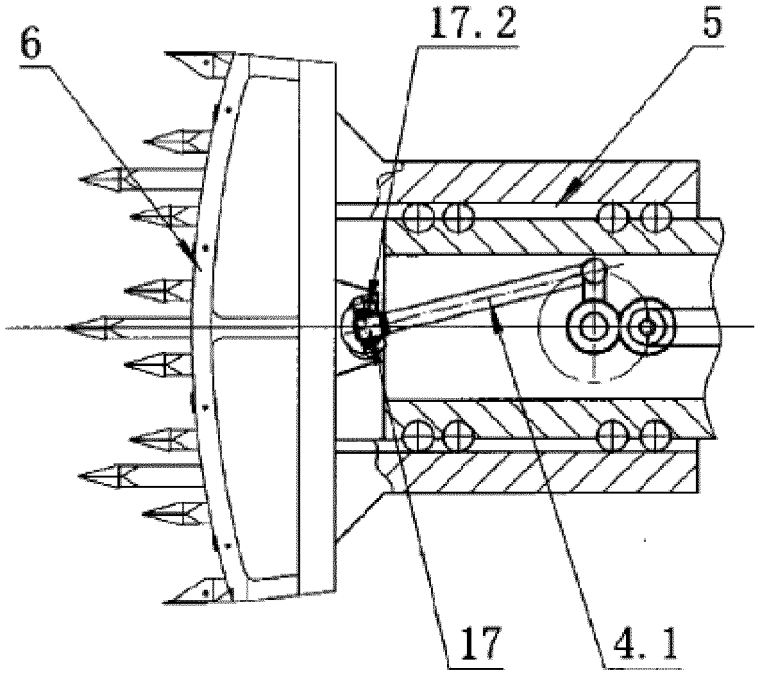

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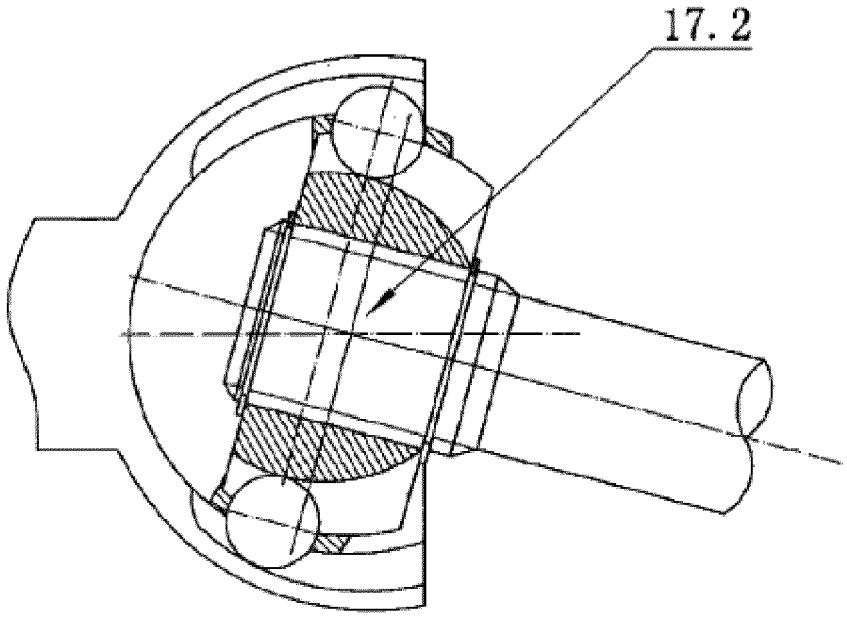

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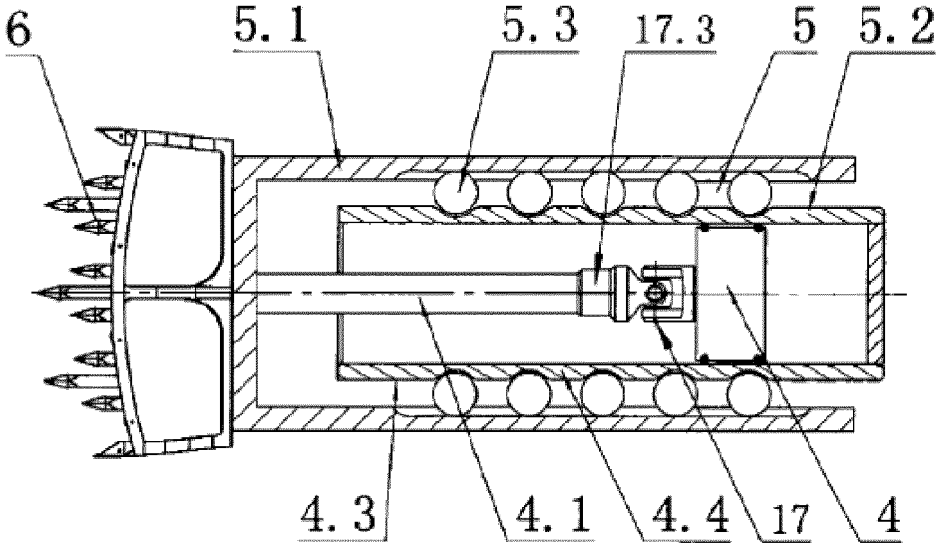

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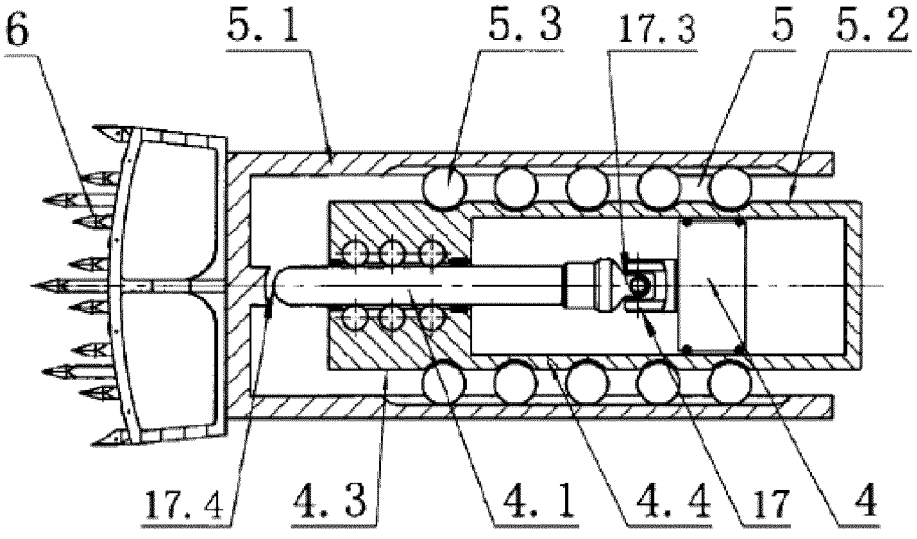


Fig.44

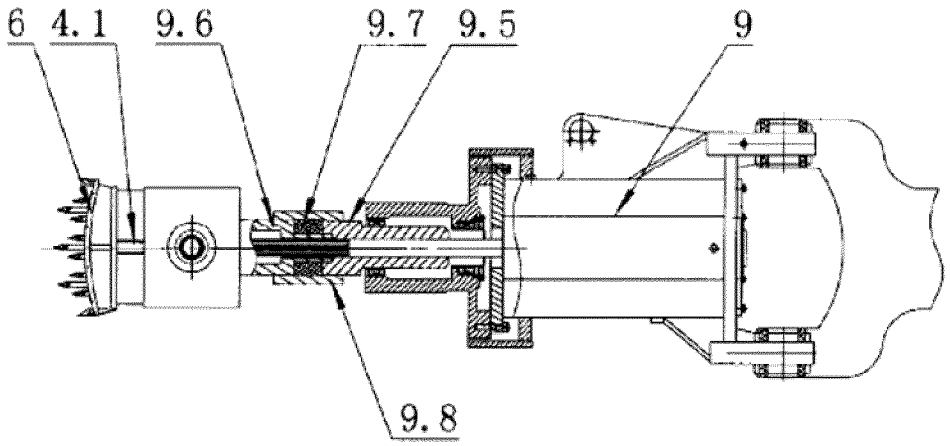
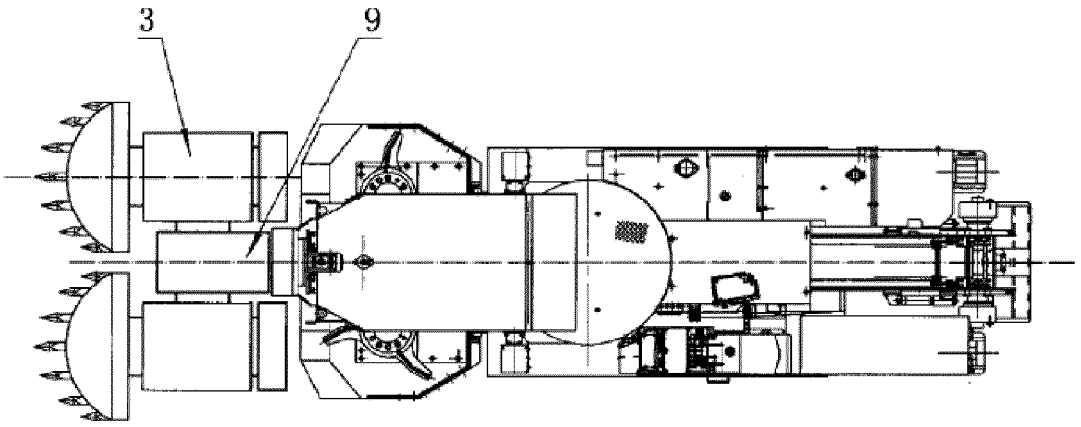


Fig. 45



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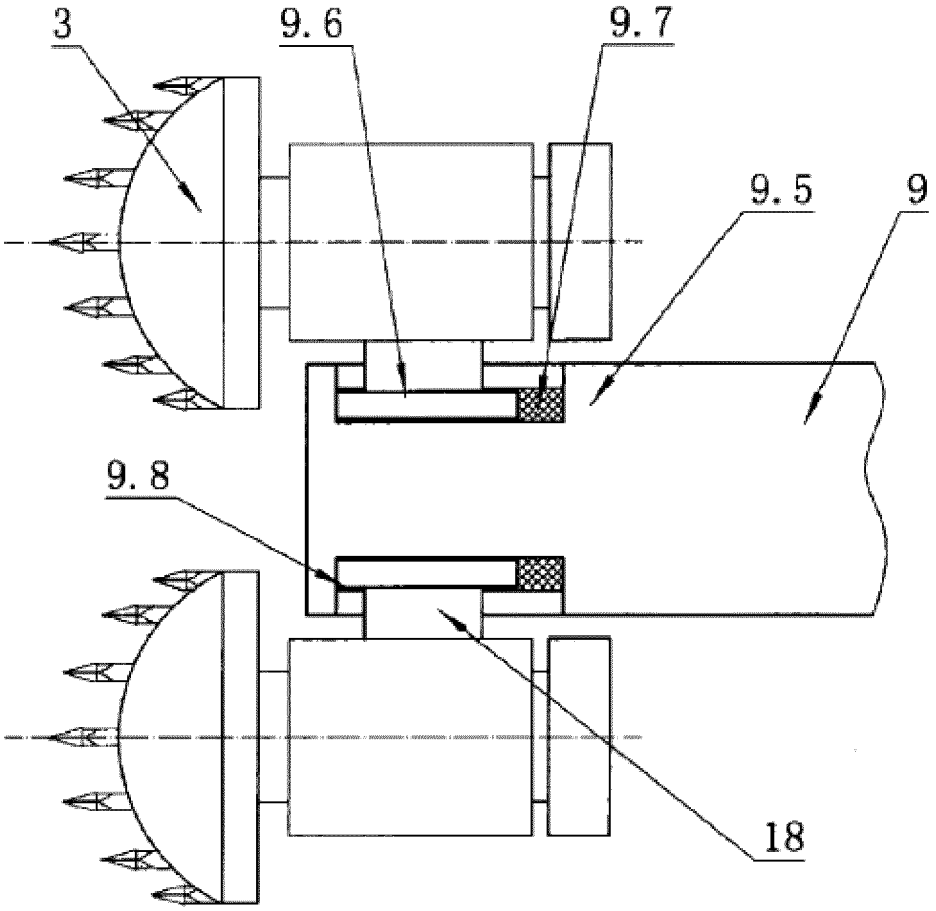
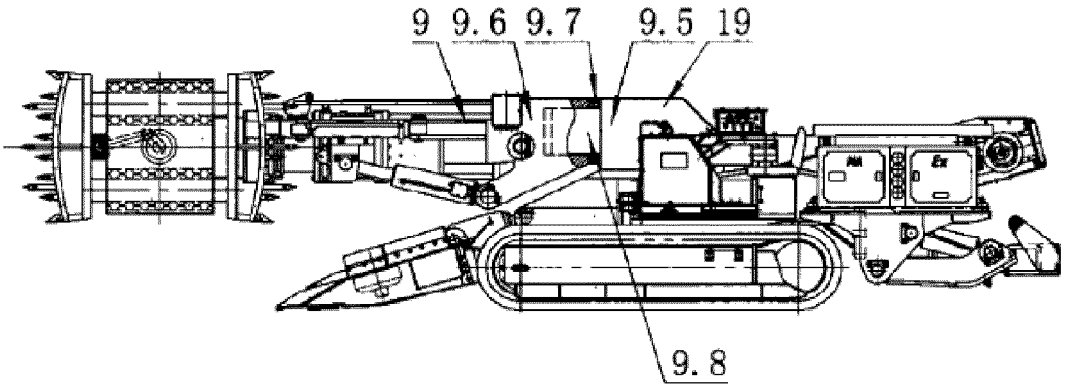


Fig. 47



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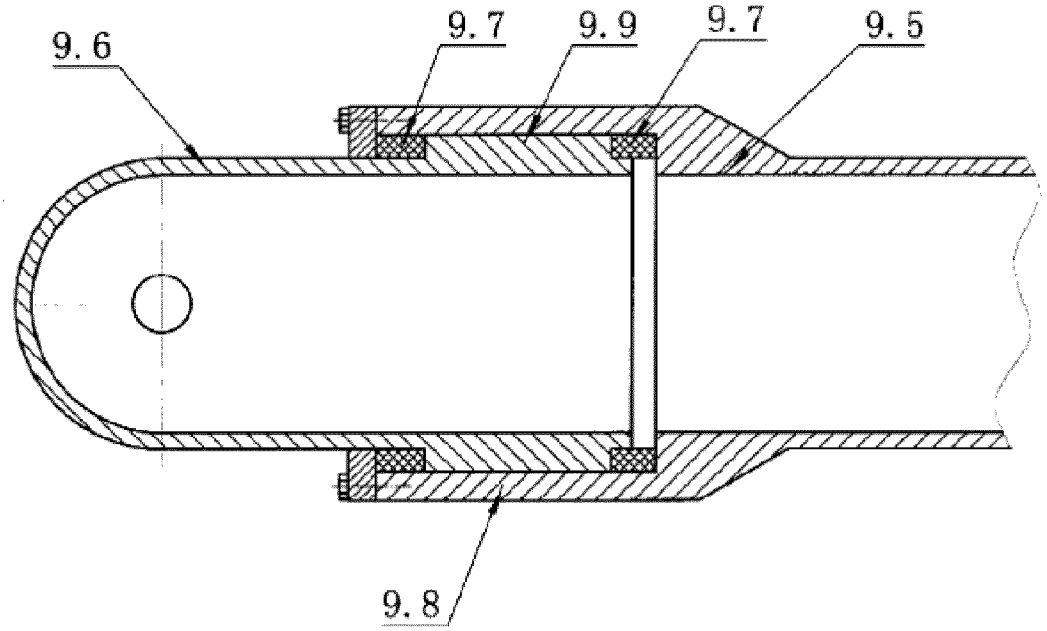


Fig. 49

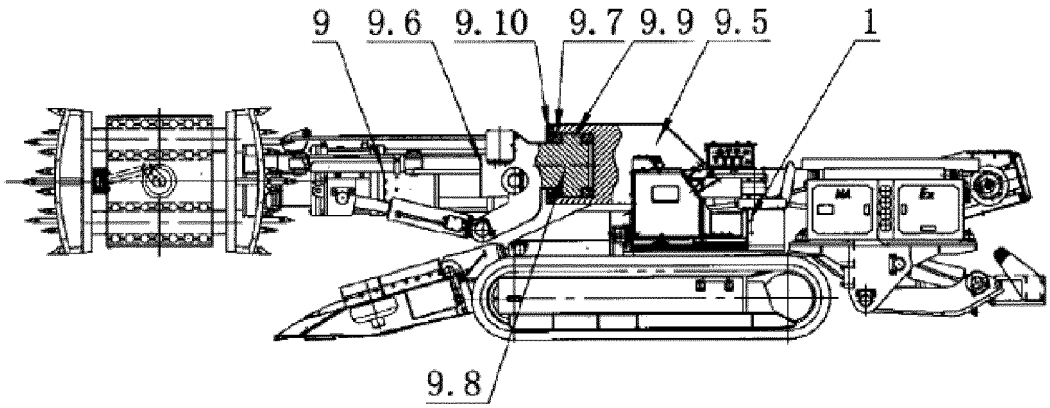
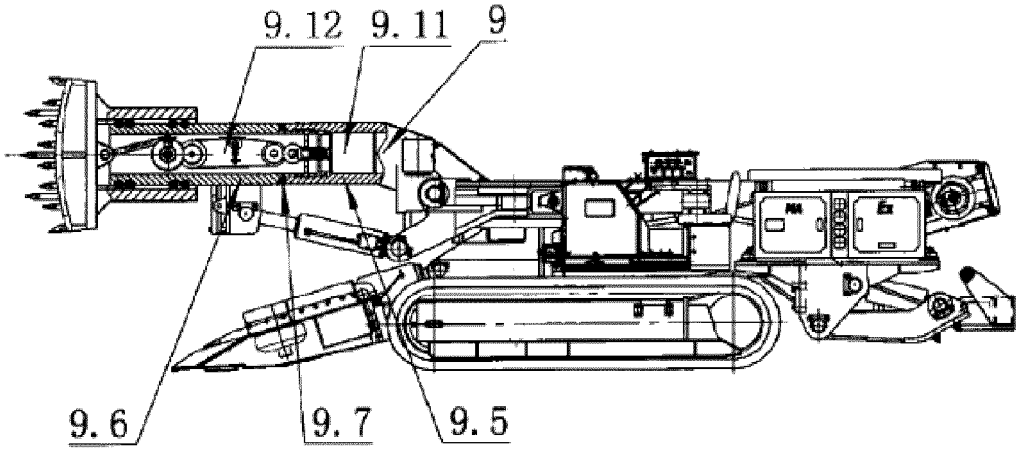


Fig. 50



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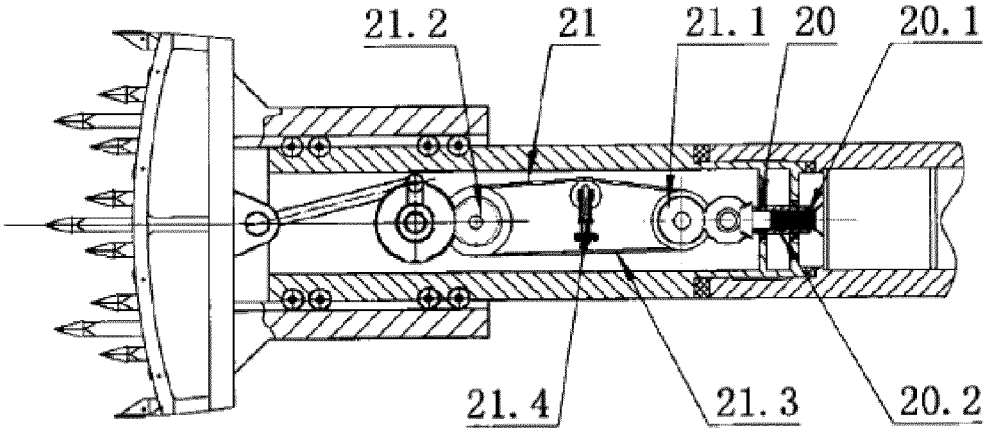


Fig. 52

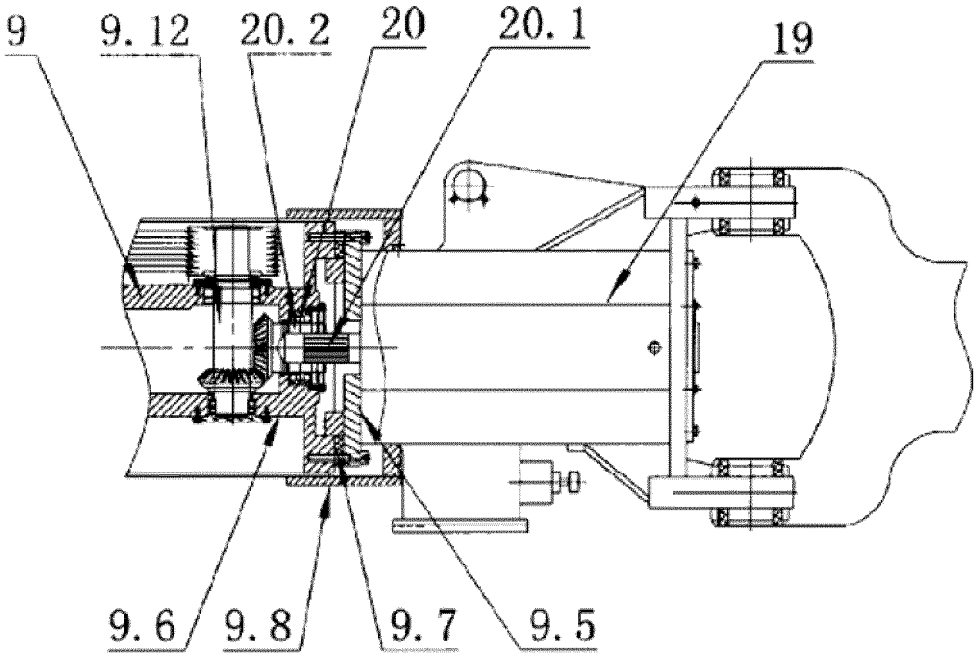


Fig. 53

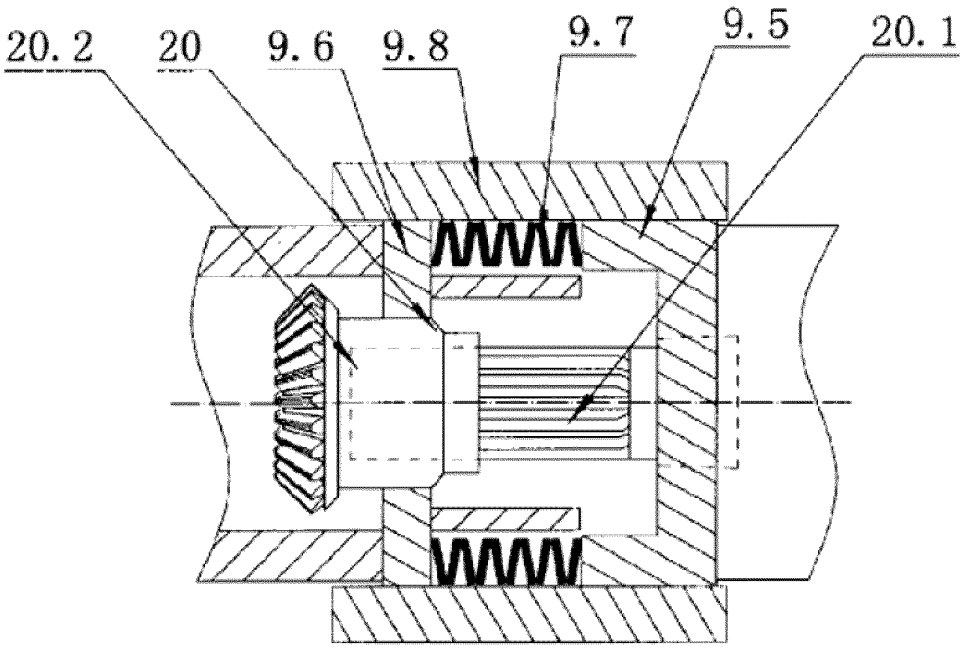


Fig. 54

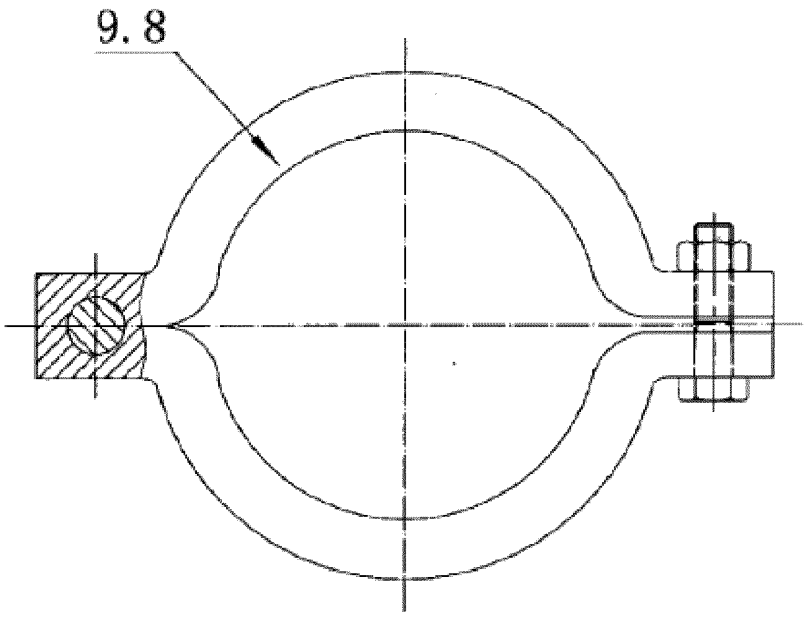
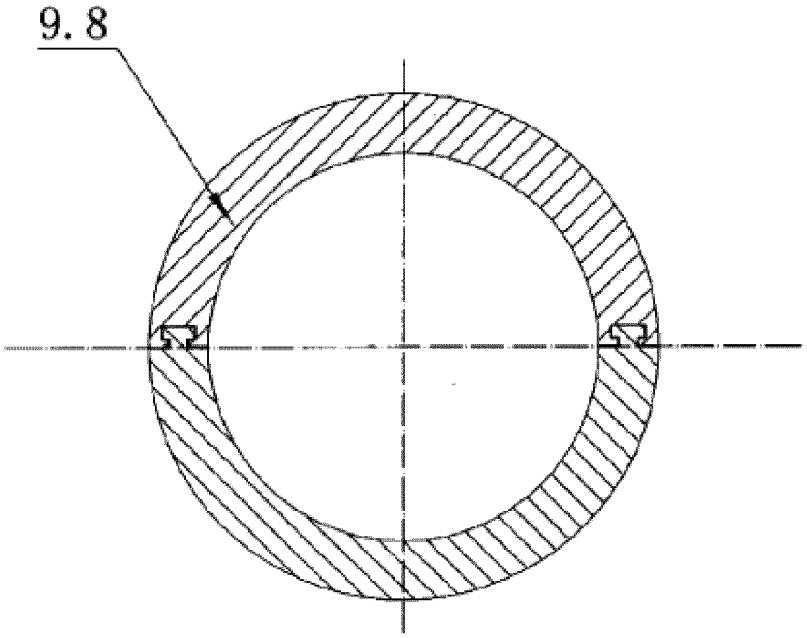


Fig. 55



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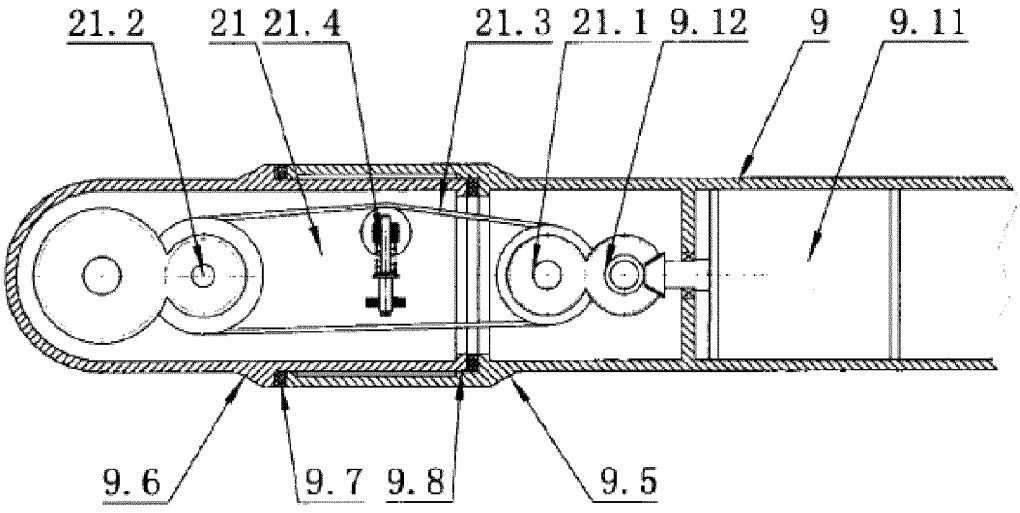

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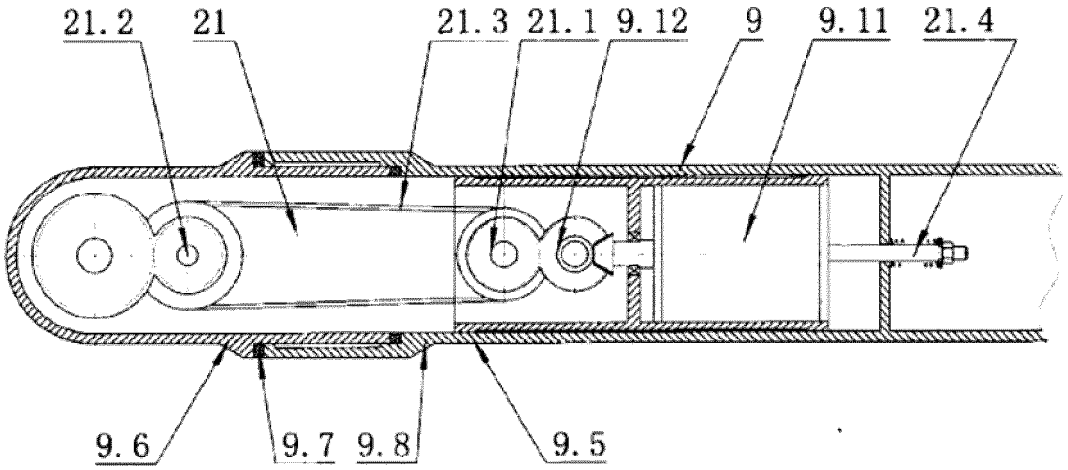

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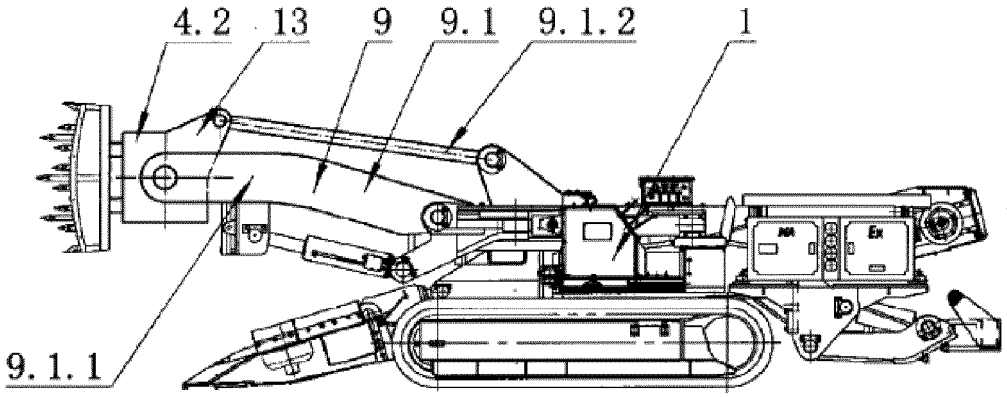


Fig. 59

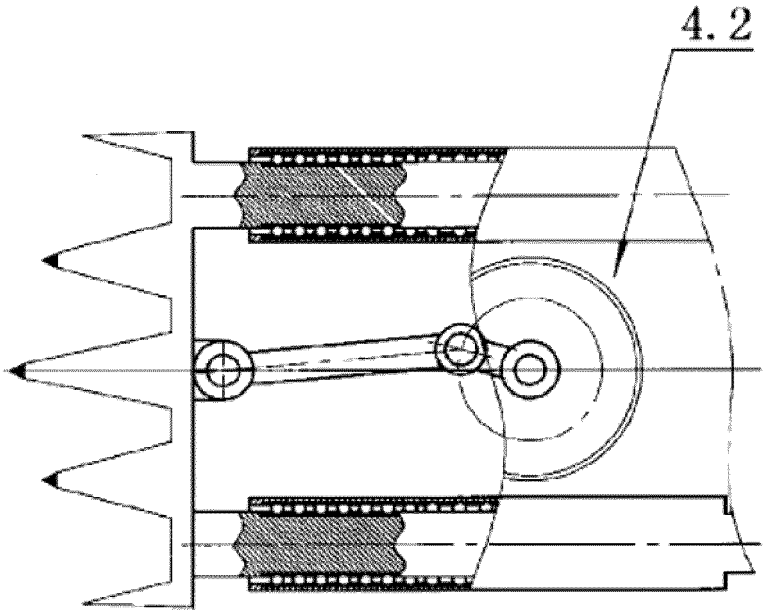


Fig. 60

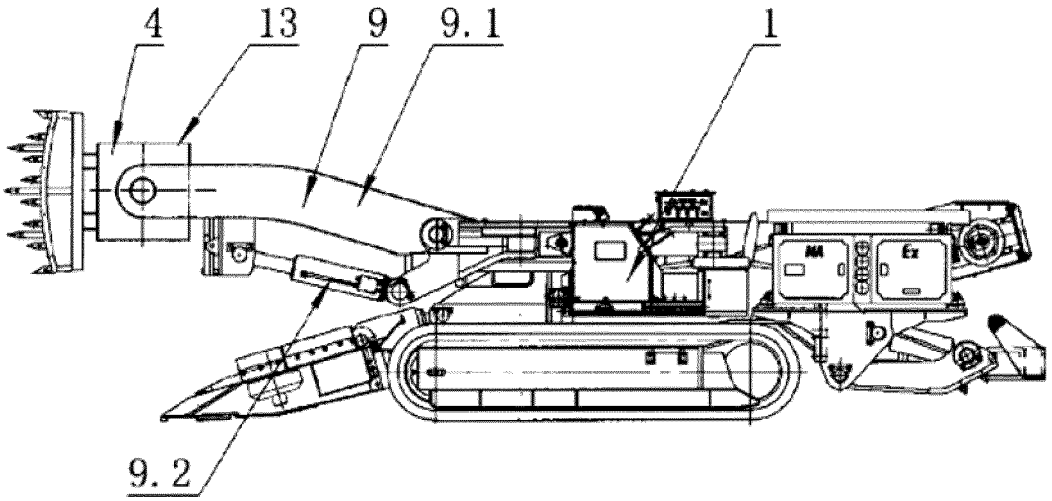


Fig. 61

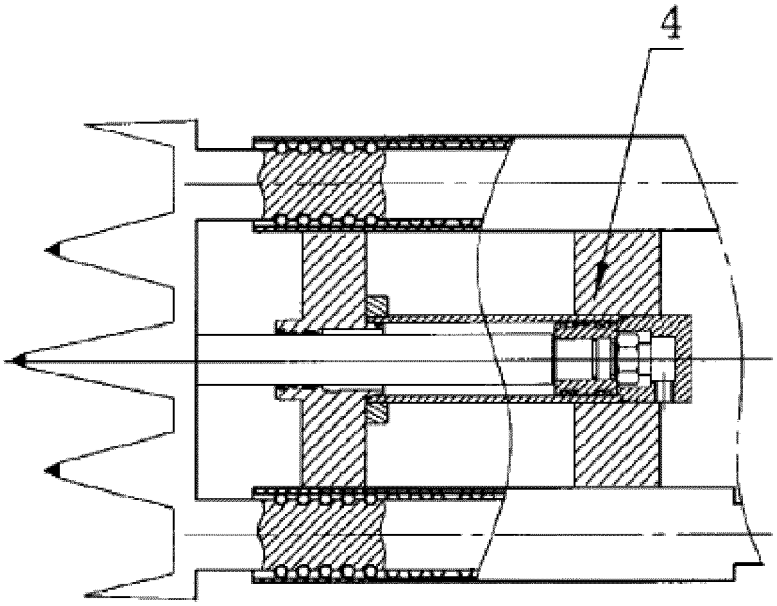


Fig. 62

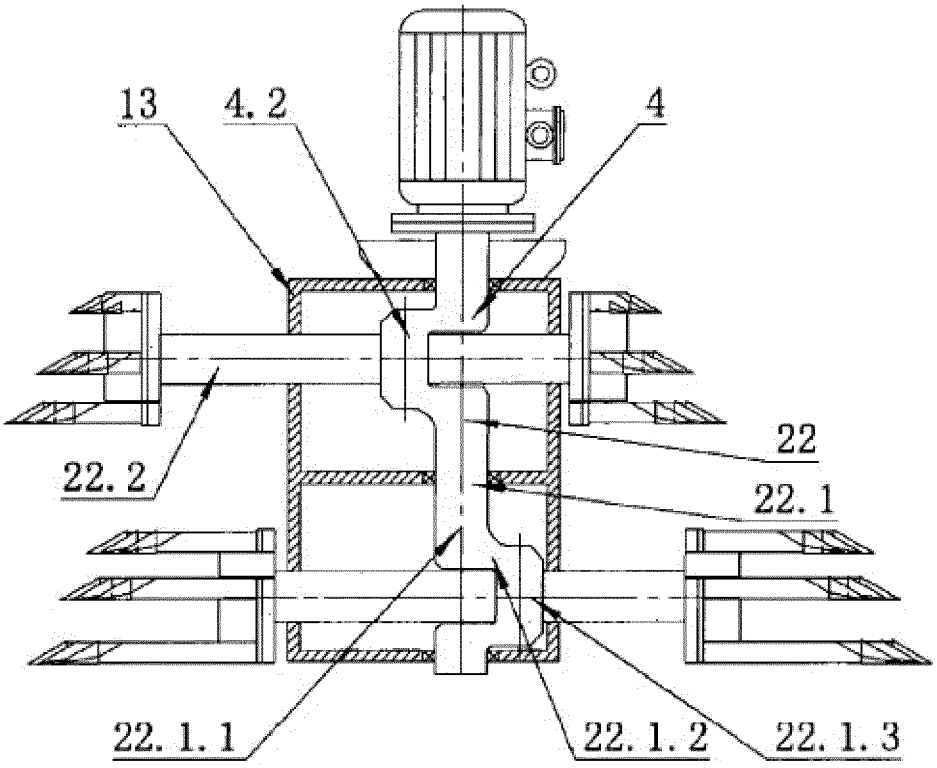
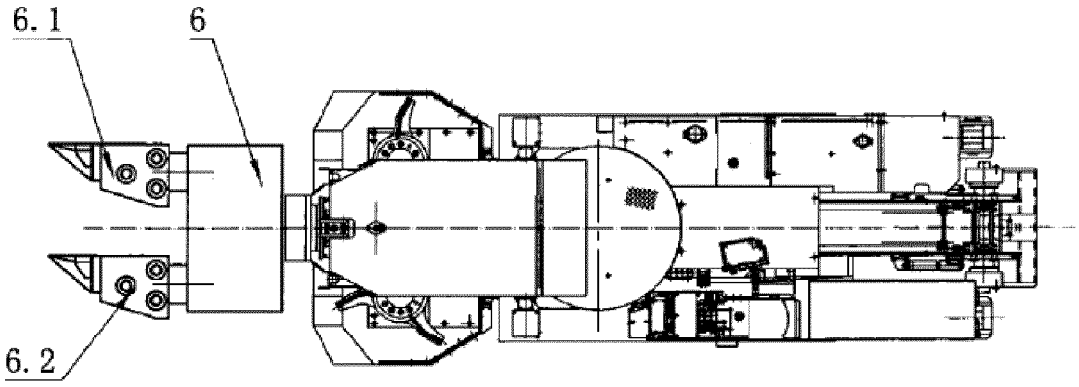


Fig. 63



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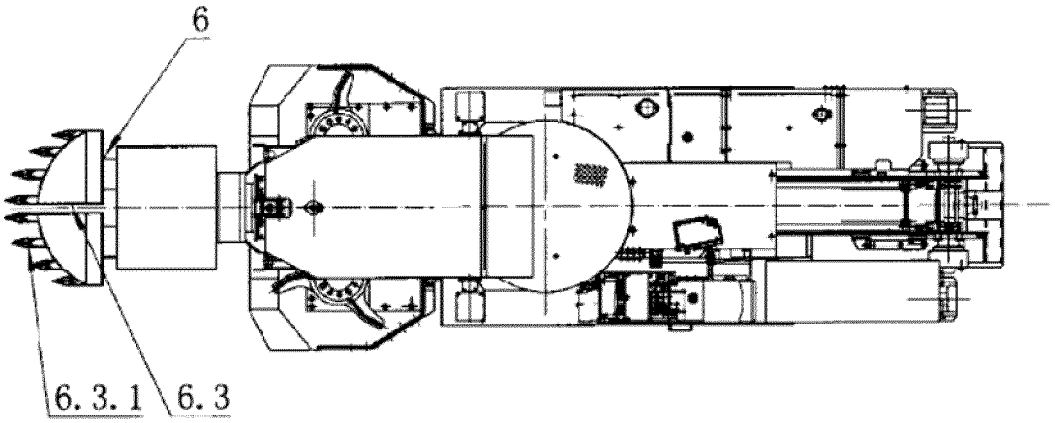

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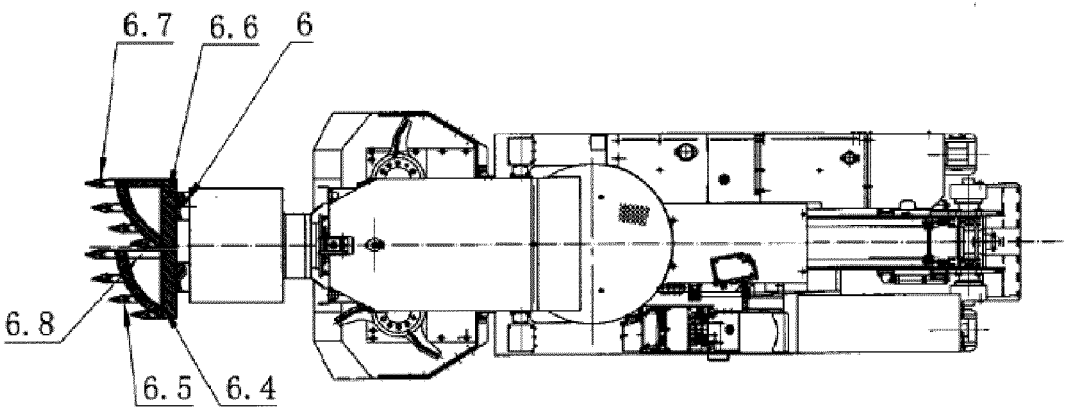


Fig. 66

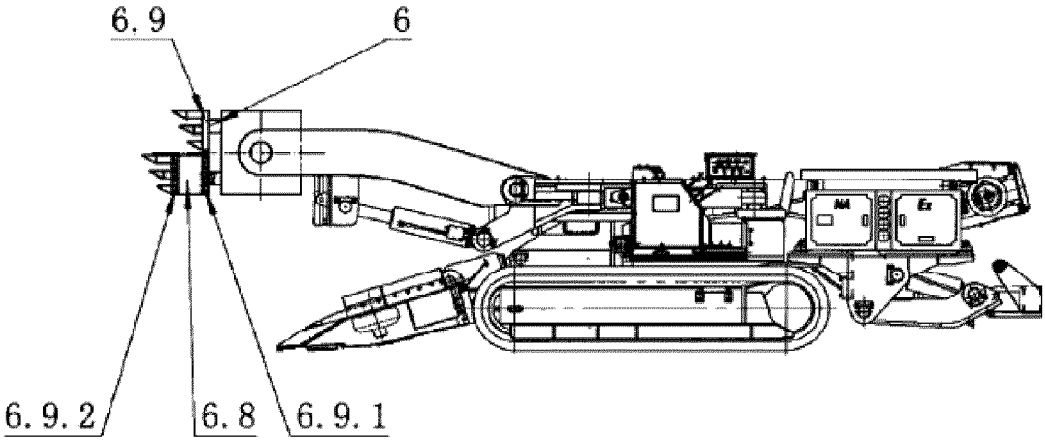


Fig. 67

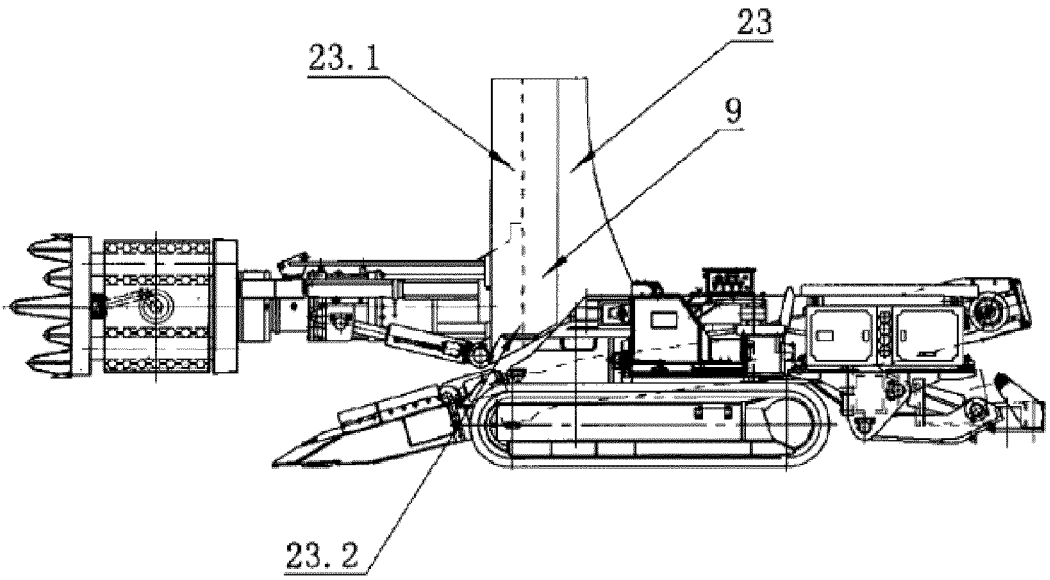


Fig. 68

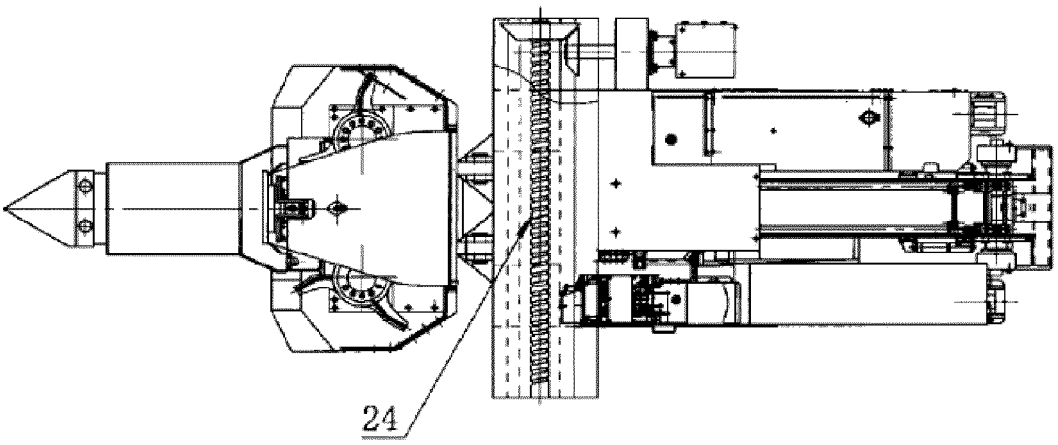
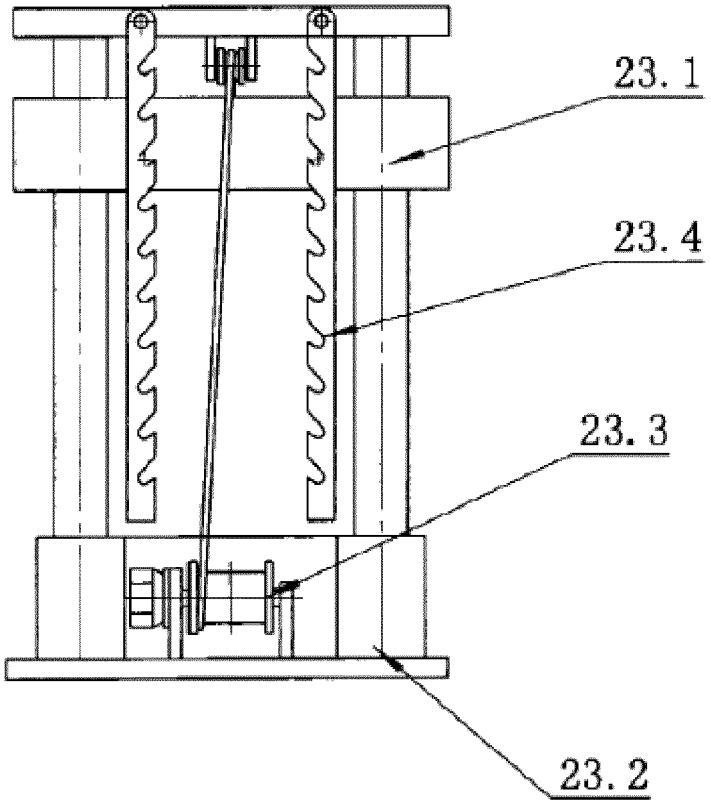


Fig. 69



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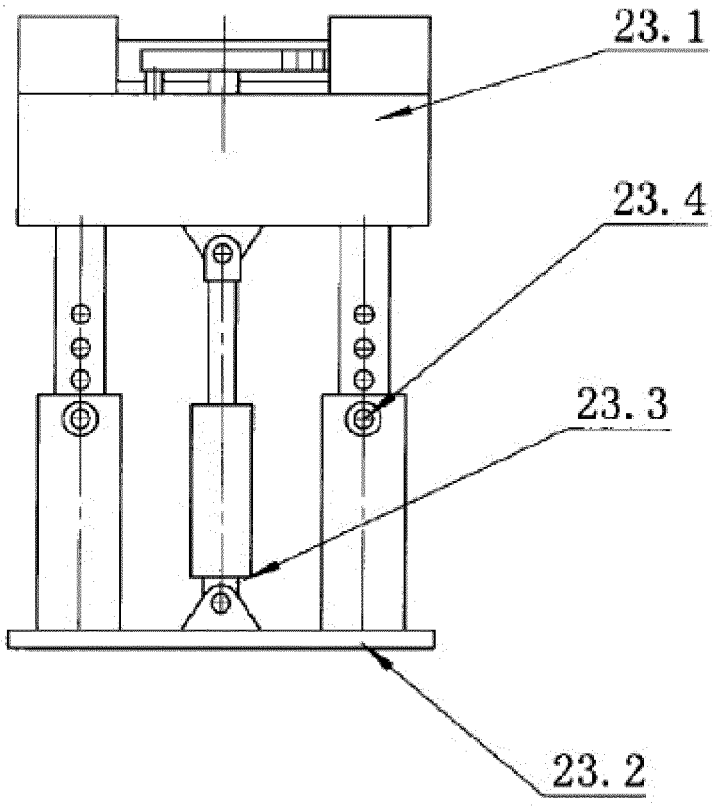

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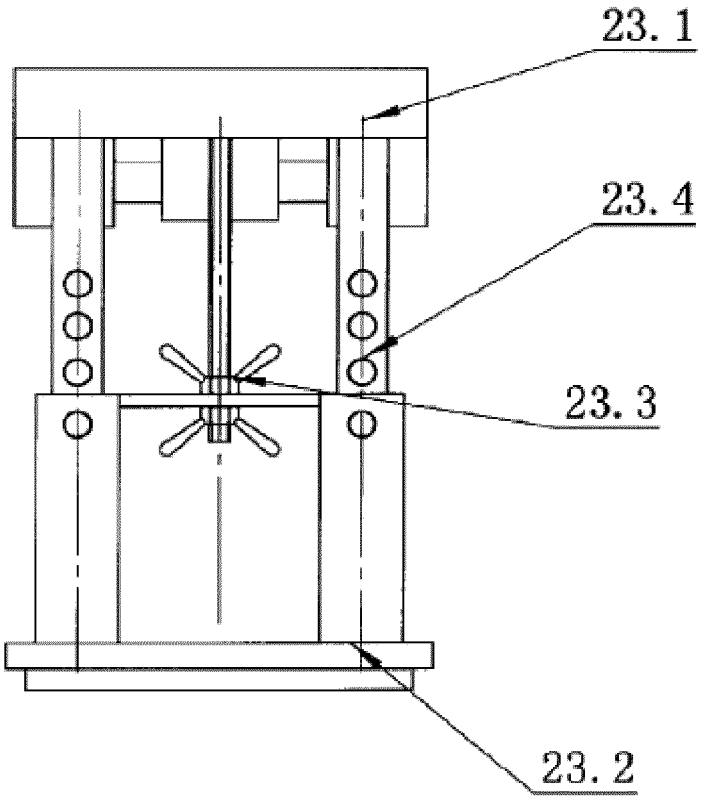

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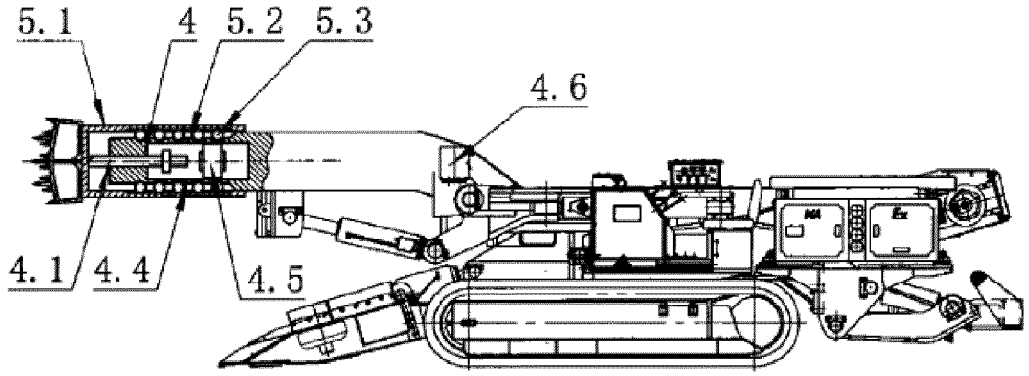

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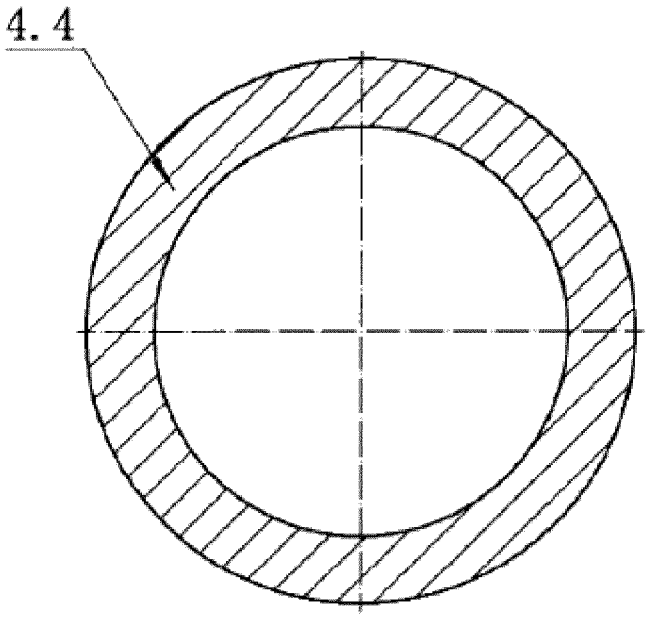

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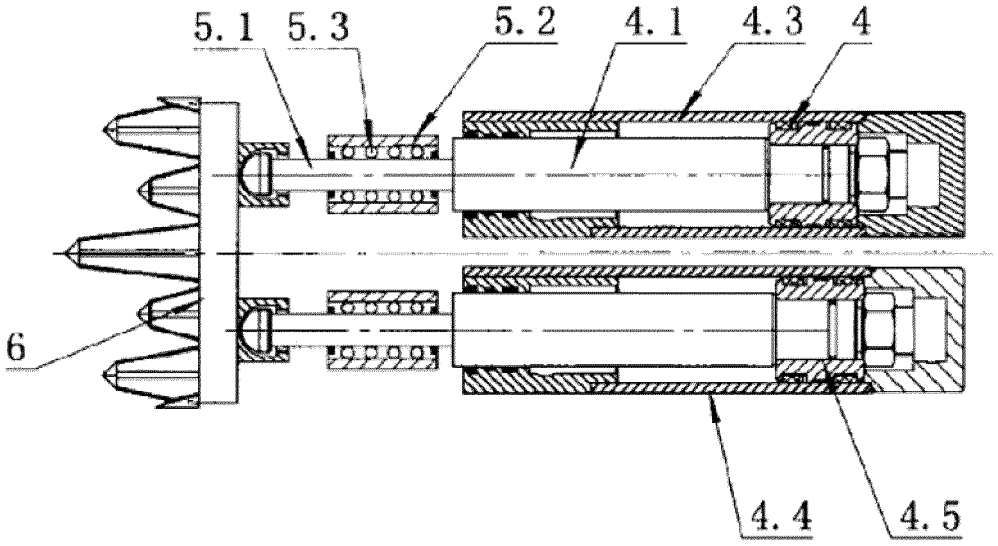

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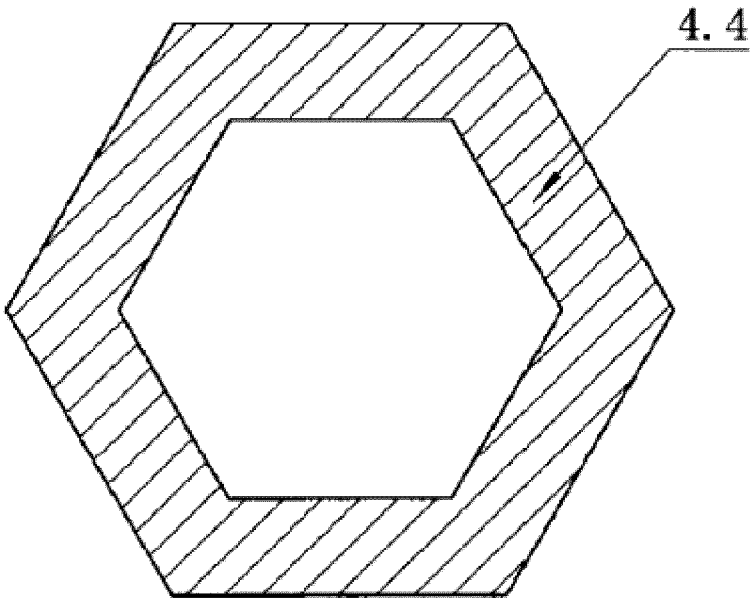

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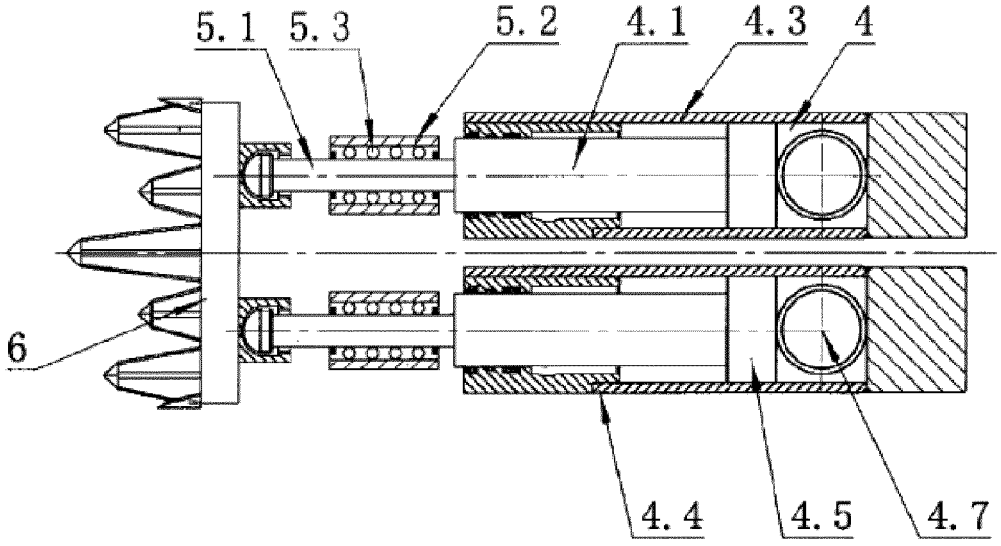

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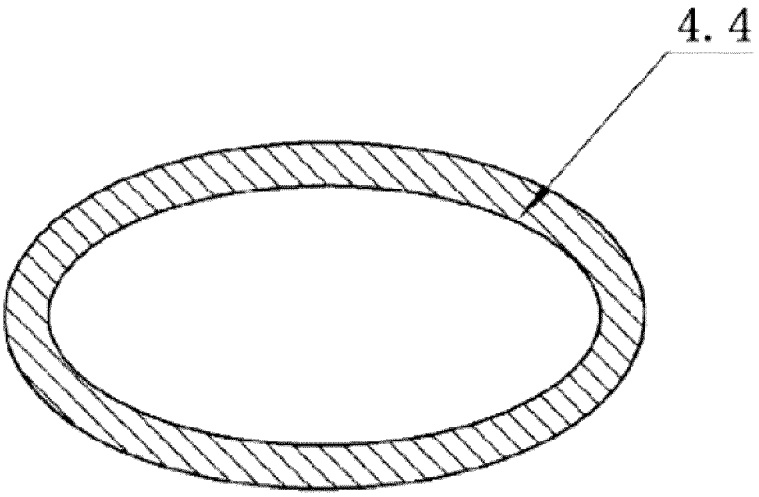

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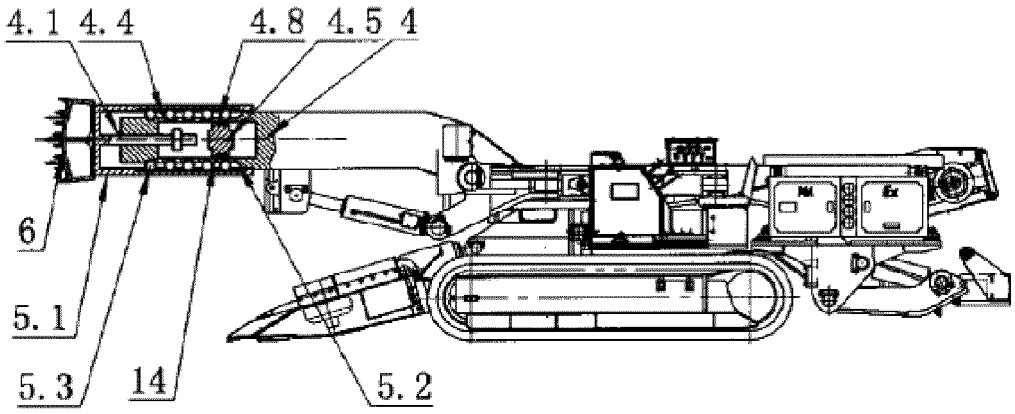

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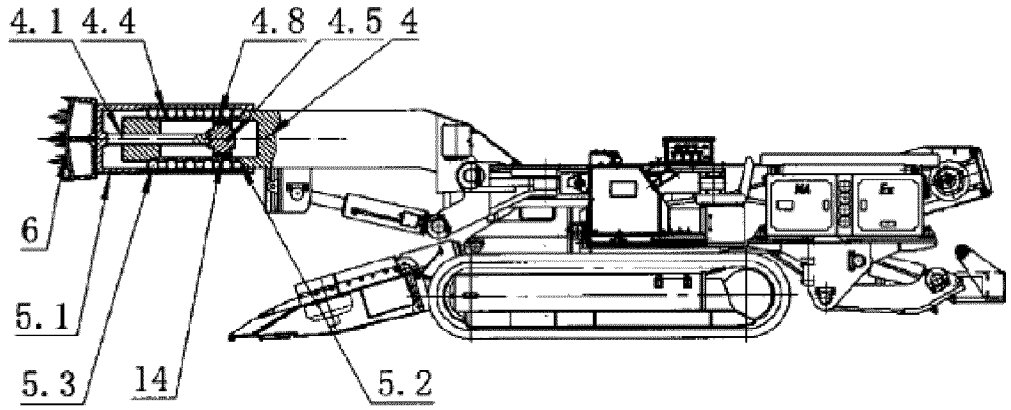

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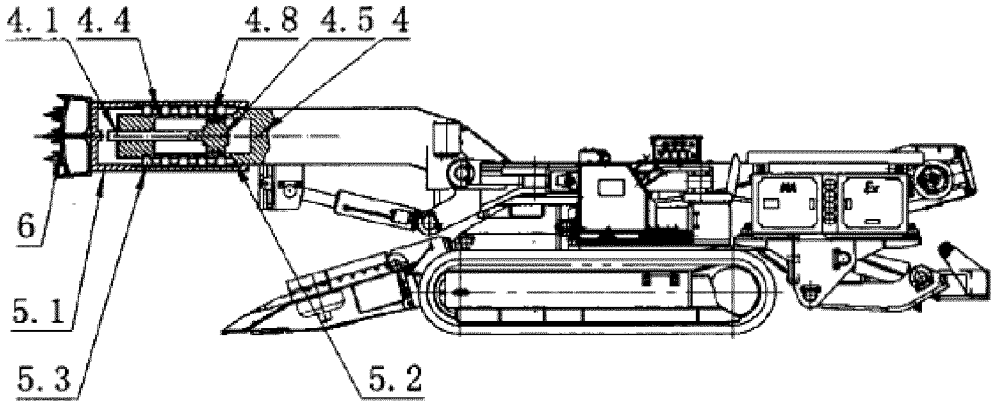

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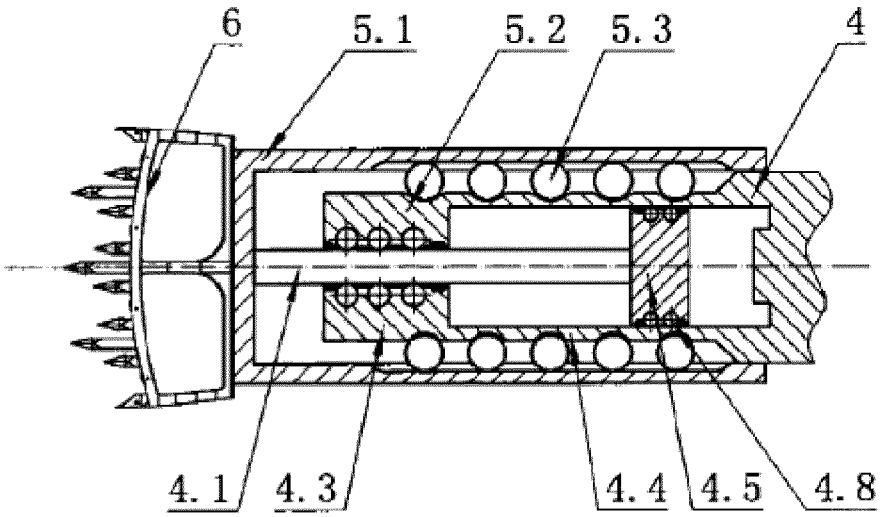

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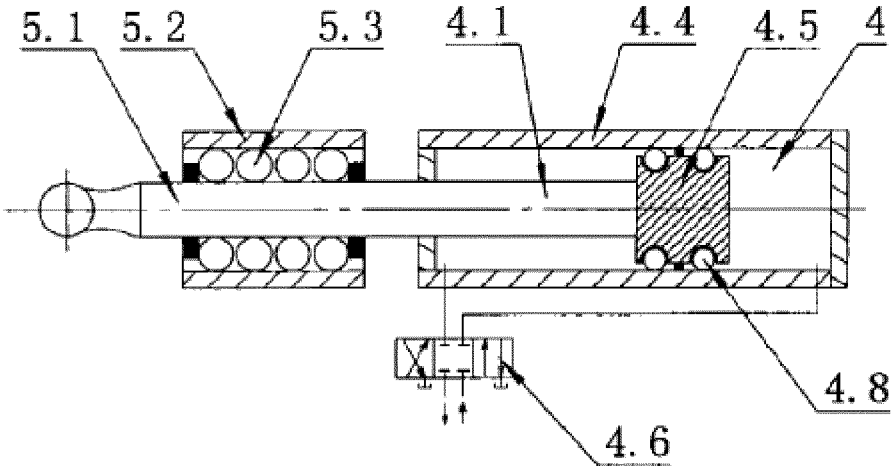

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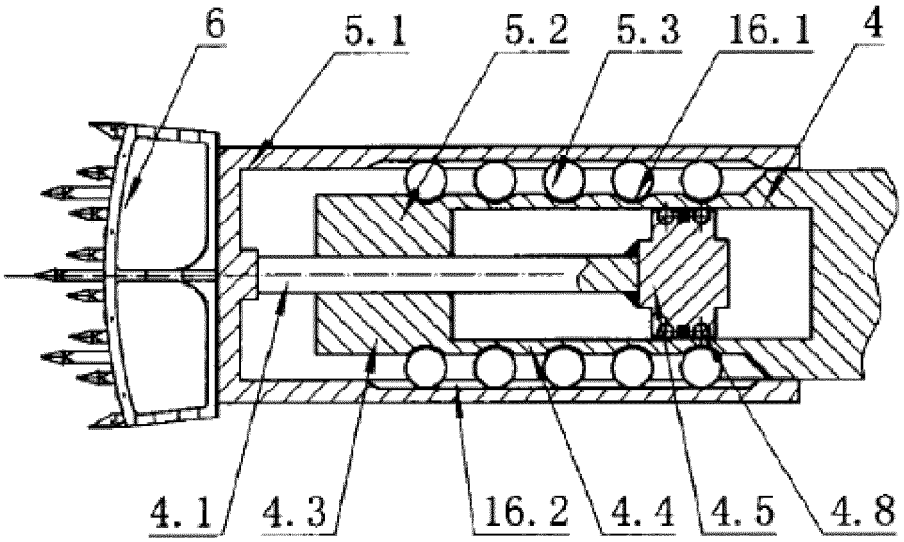
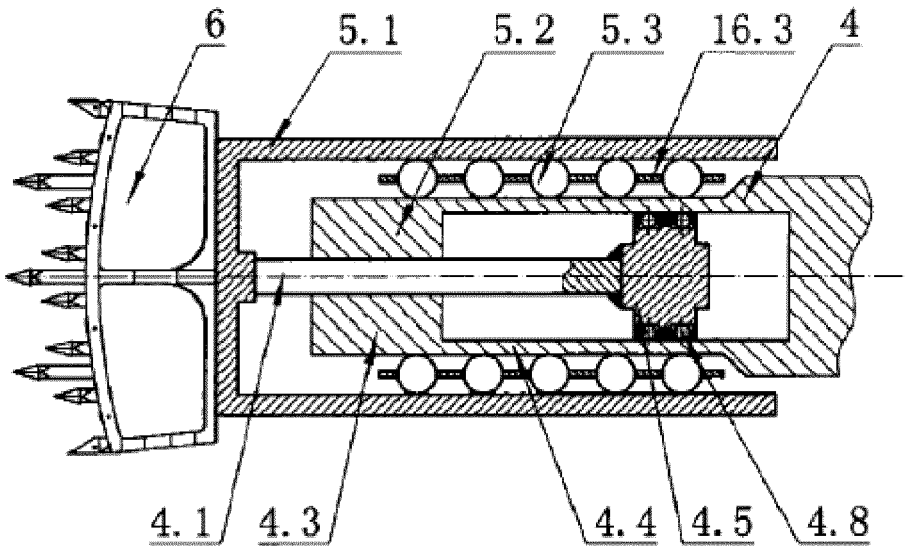


Fig. 84


6
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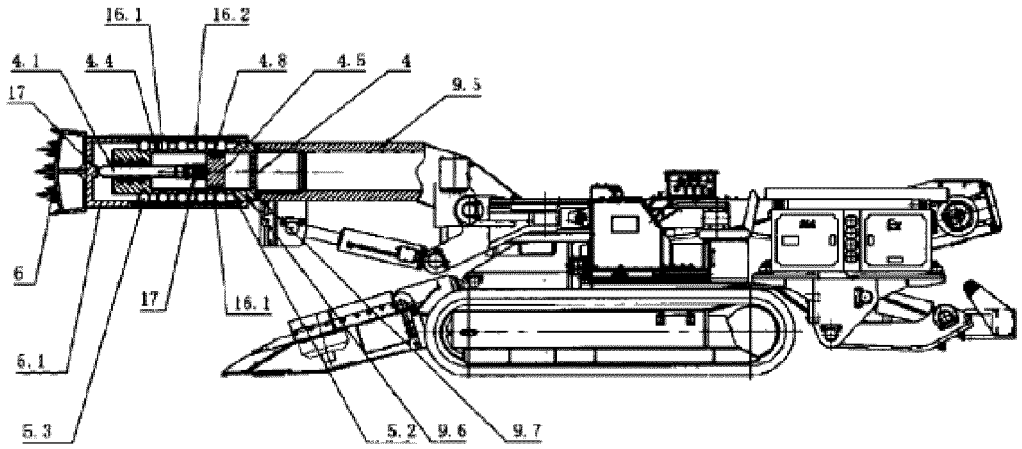
5.2
5.3
16.3
4
4.1
4.3
4.4
4.5
4.8

Fig. 85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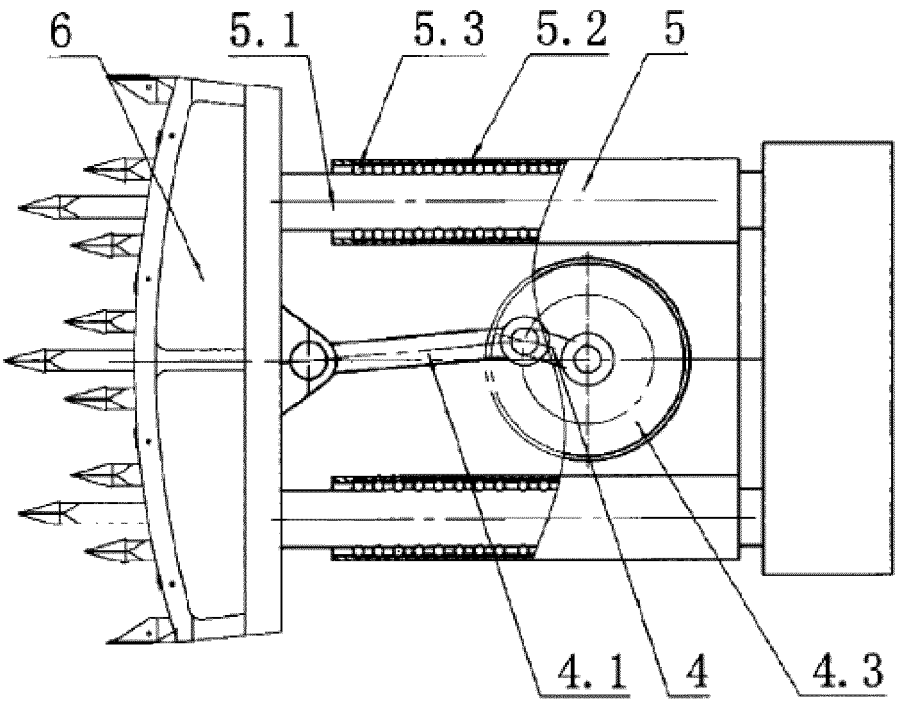
17
16.1
6.1
5.3
5.2
9.6
9.7

Fig. 86



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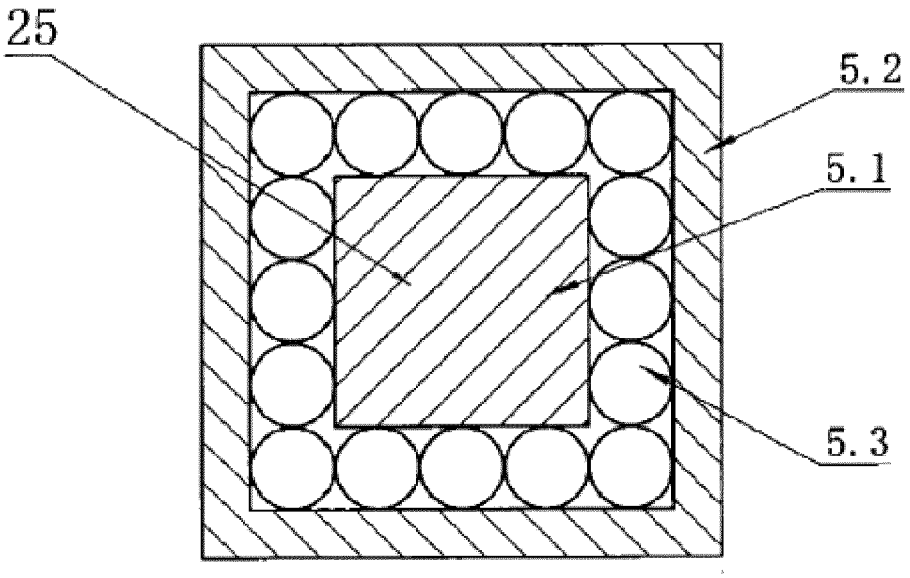

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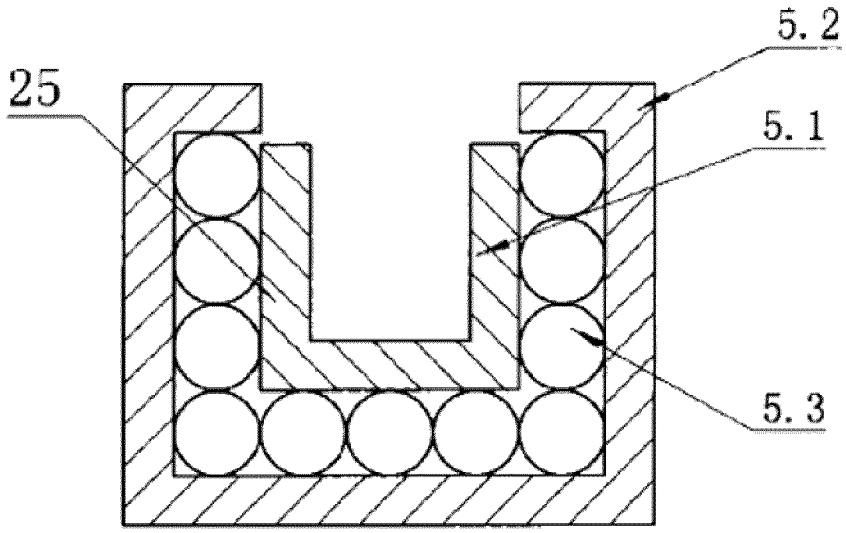

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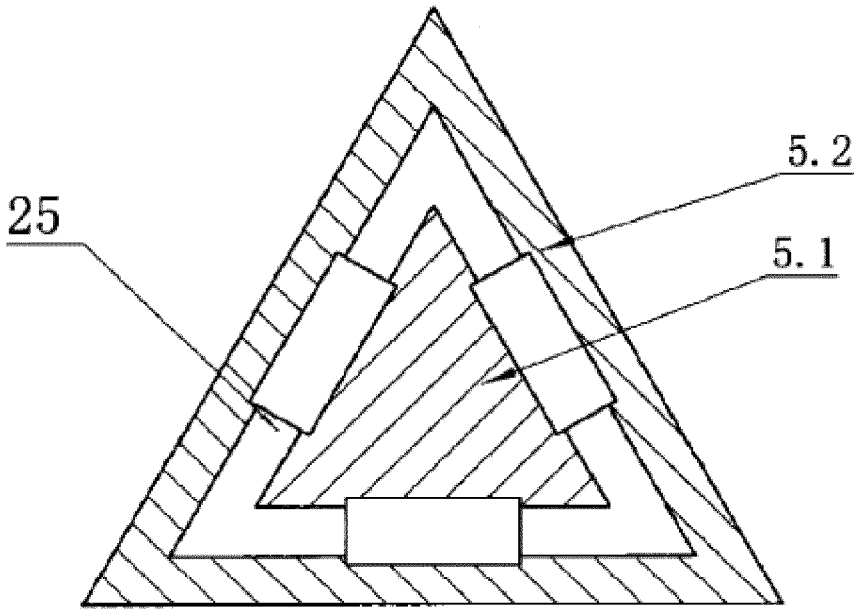
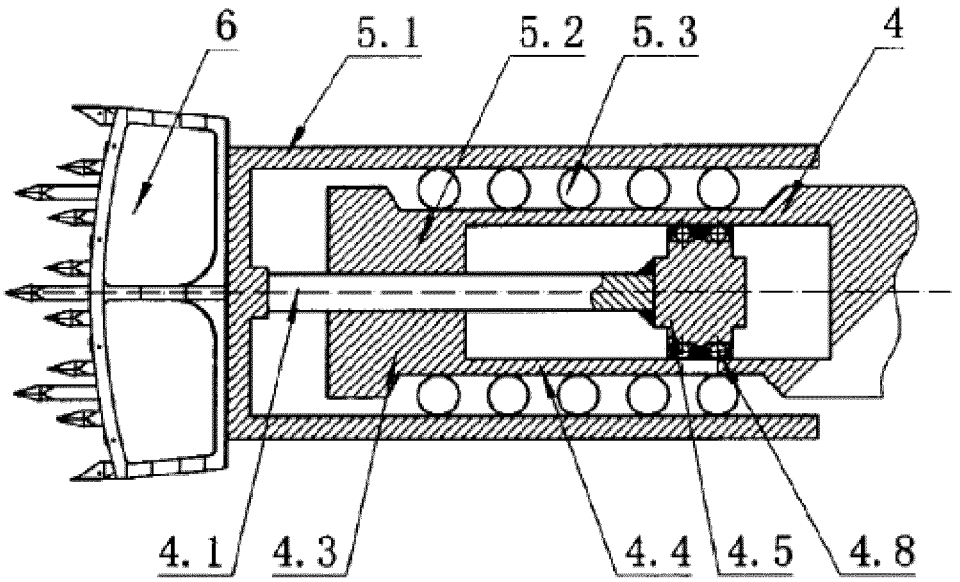


Fig. 90



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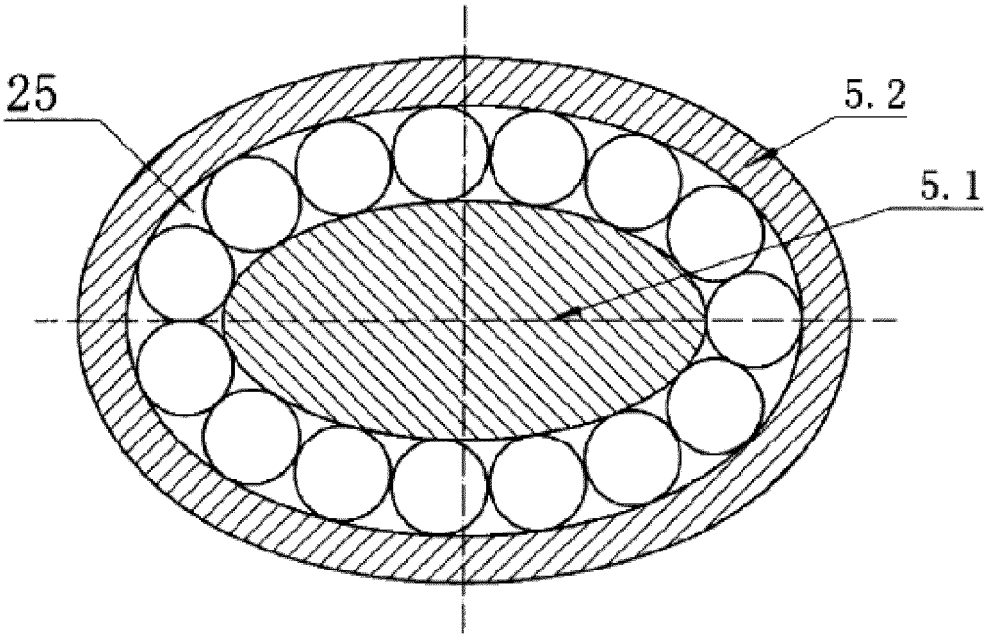

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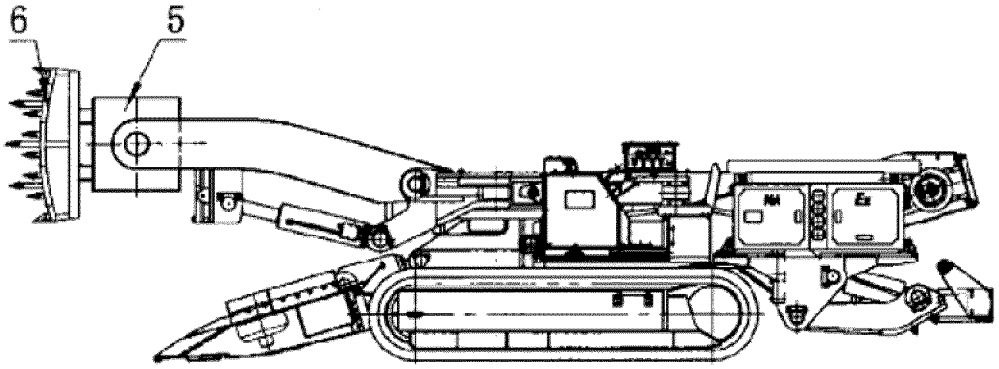

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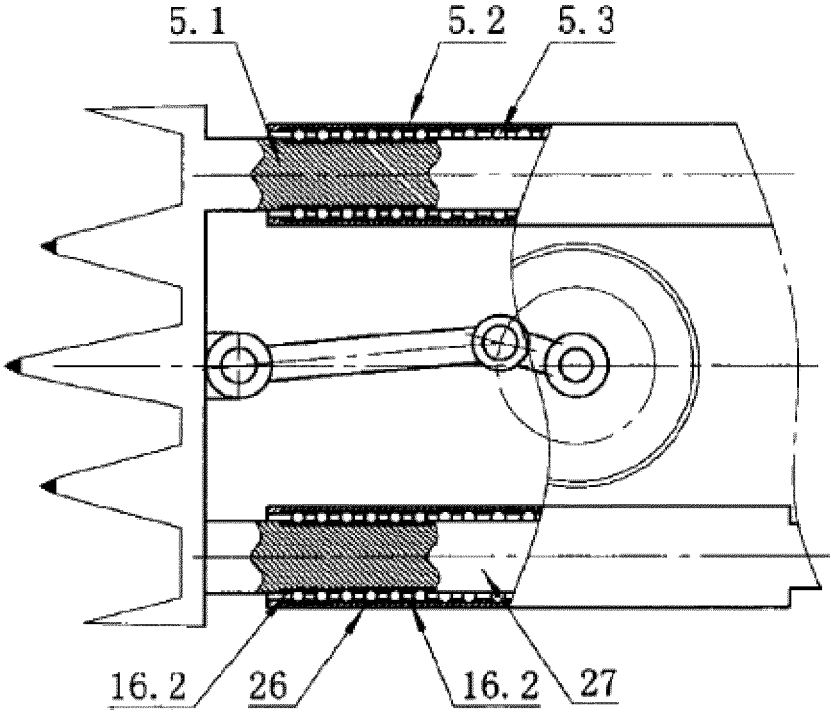


Fig. 94

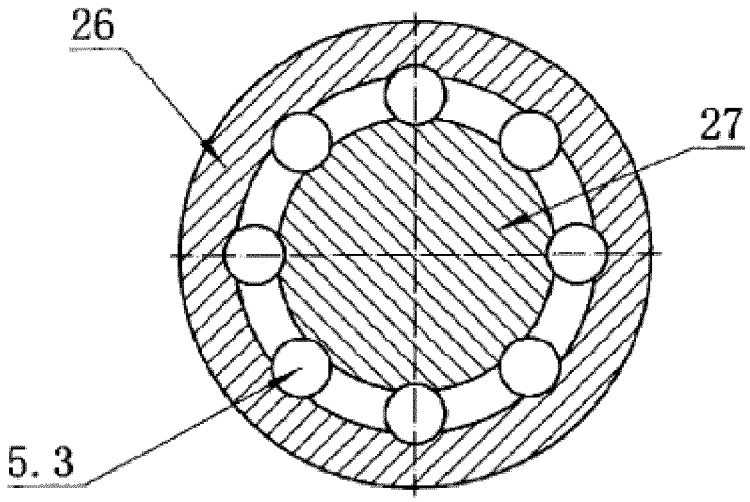


Fig. 95

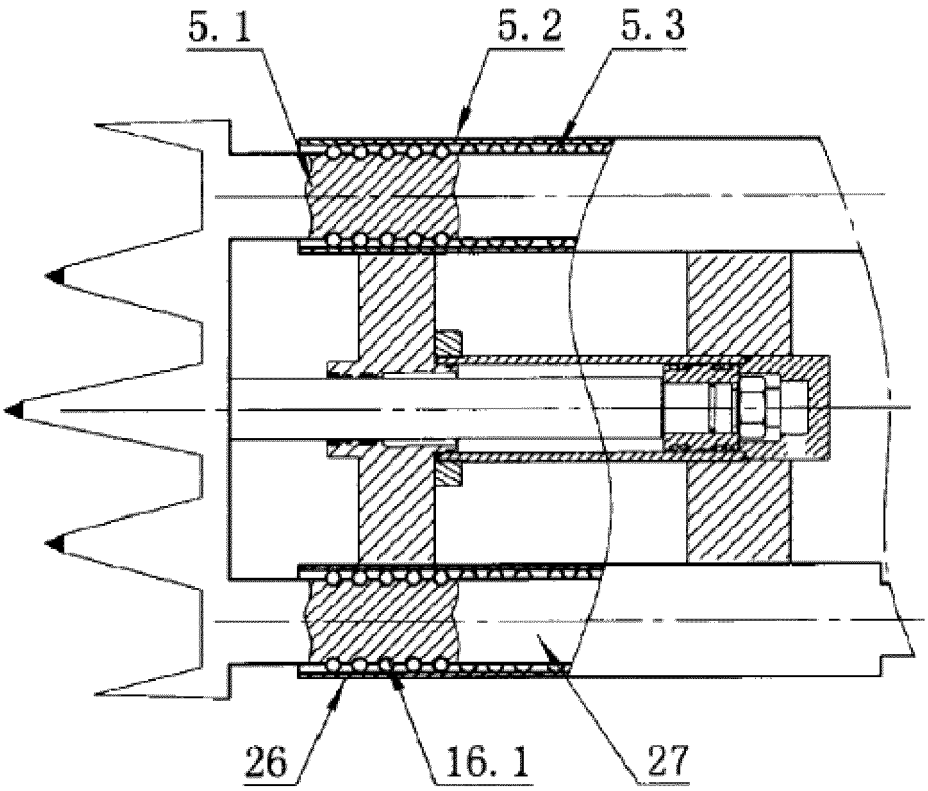
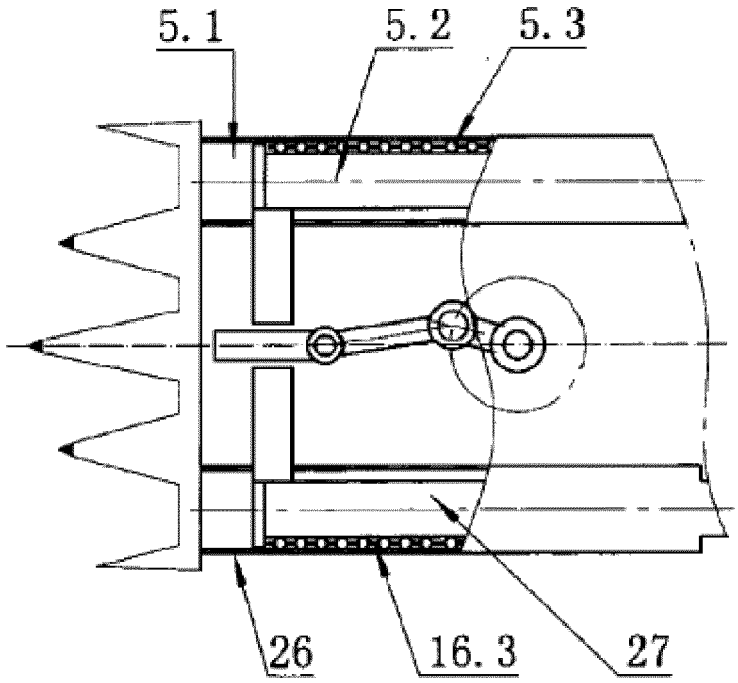


Fig. 96



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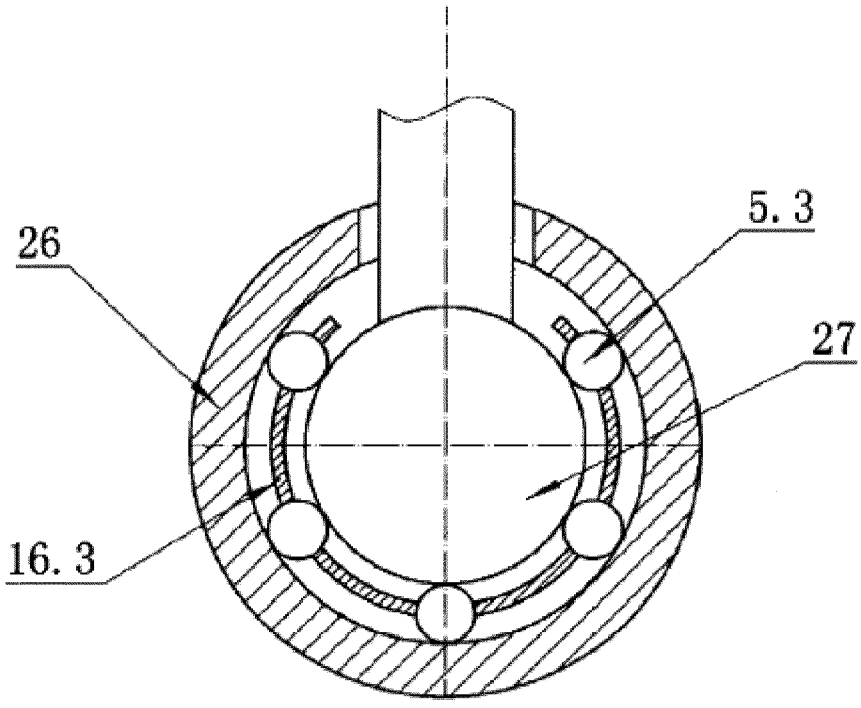
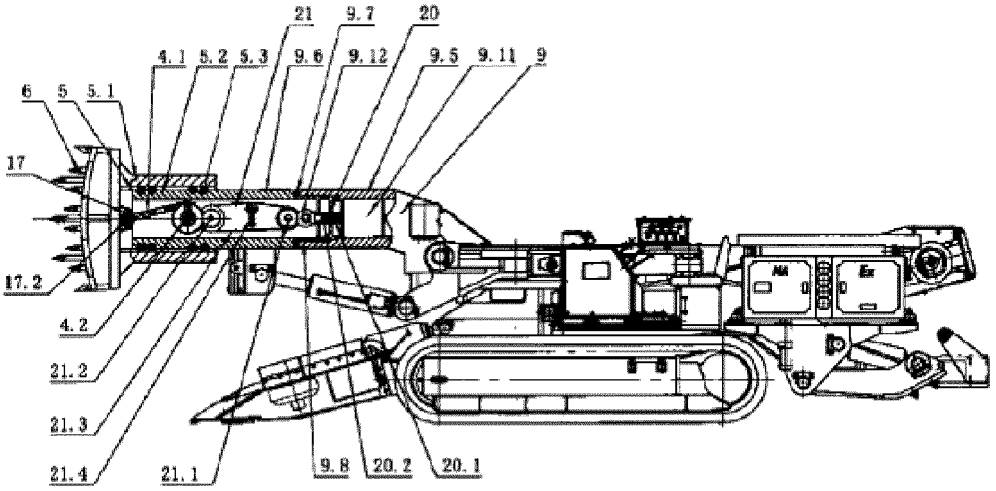


Fig. 98



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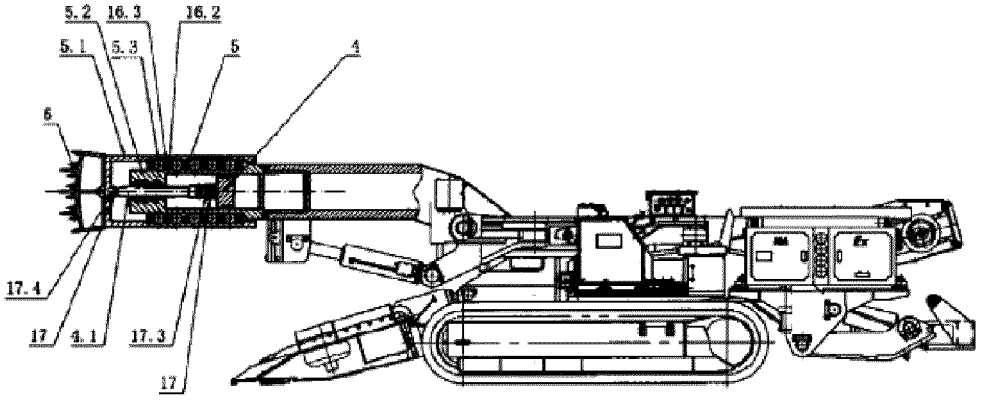


Fig. 100

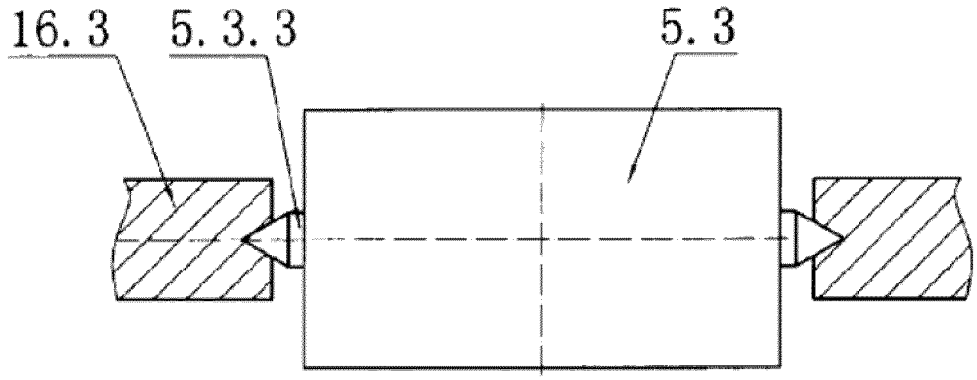
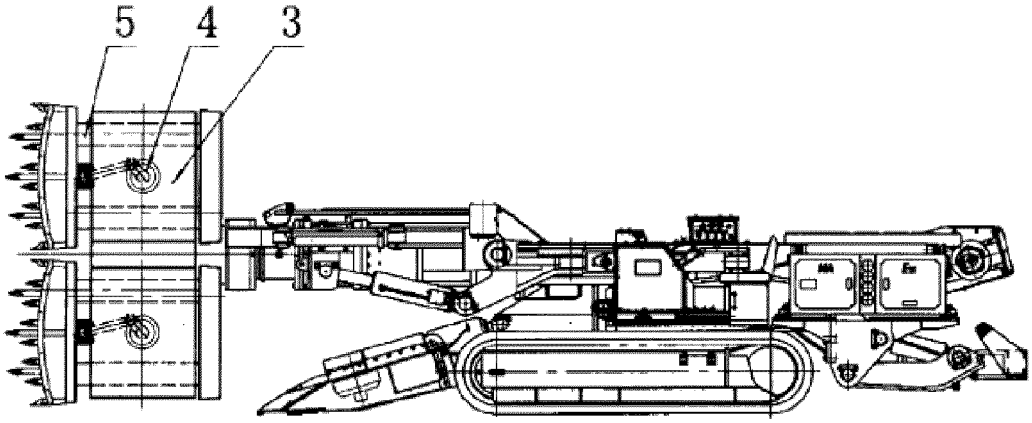


Fig. 101



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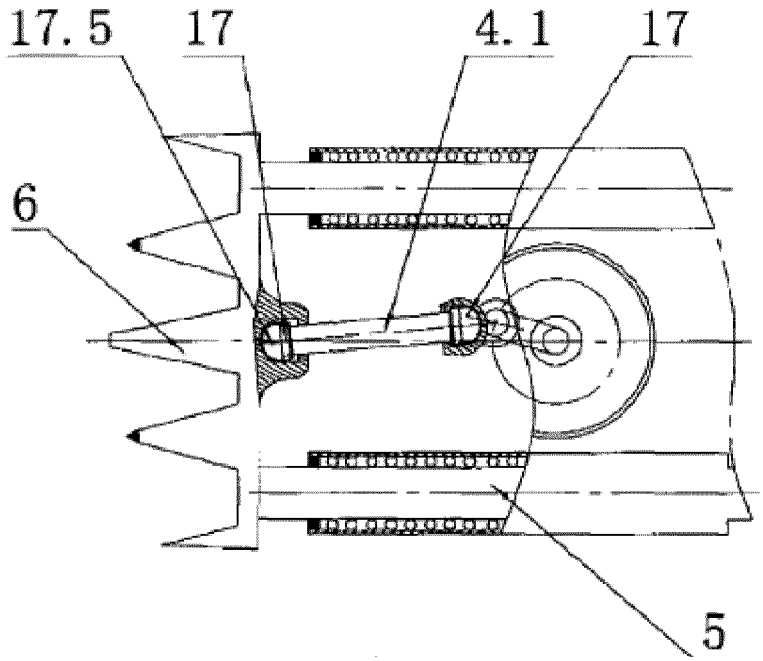


Fig. 103

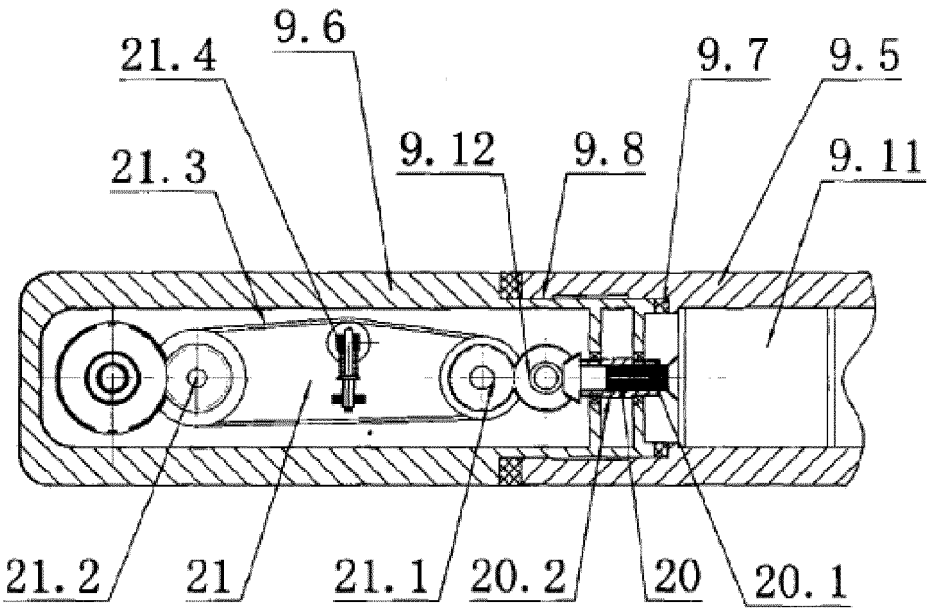


Fig. 104

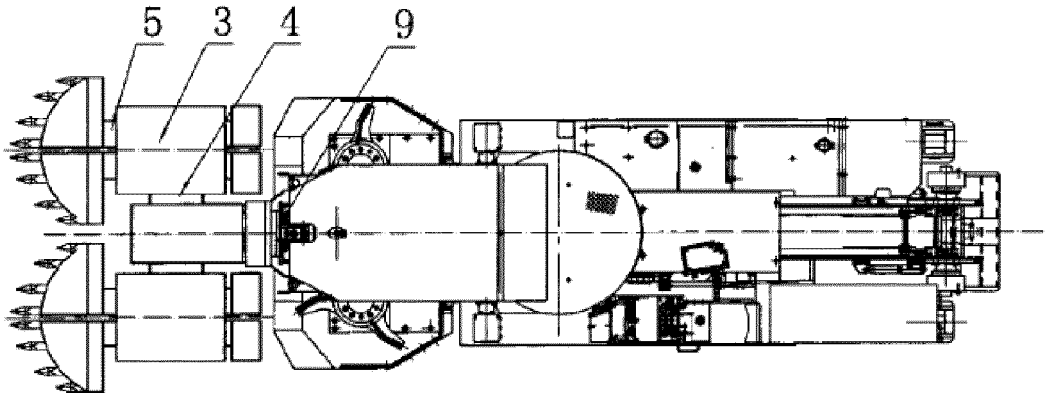


Fig. 105

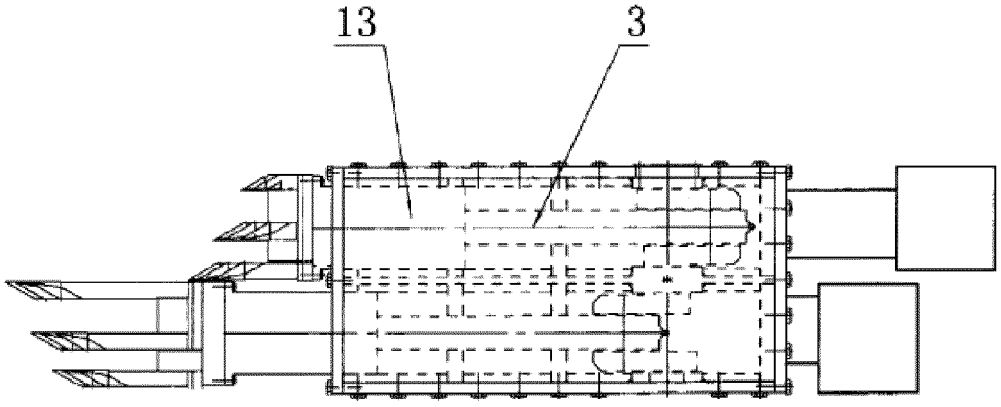


Fig. 106

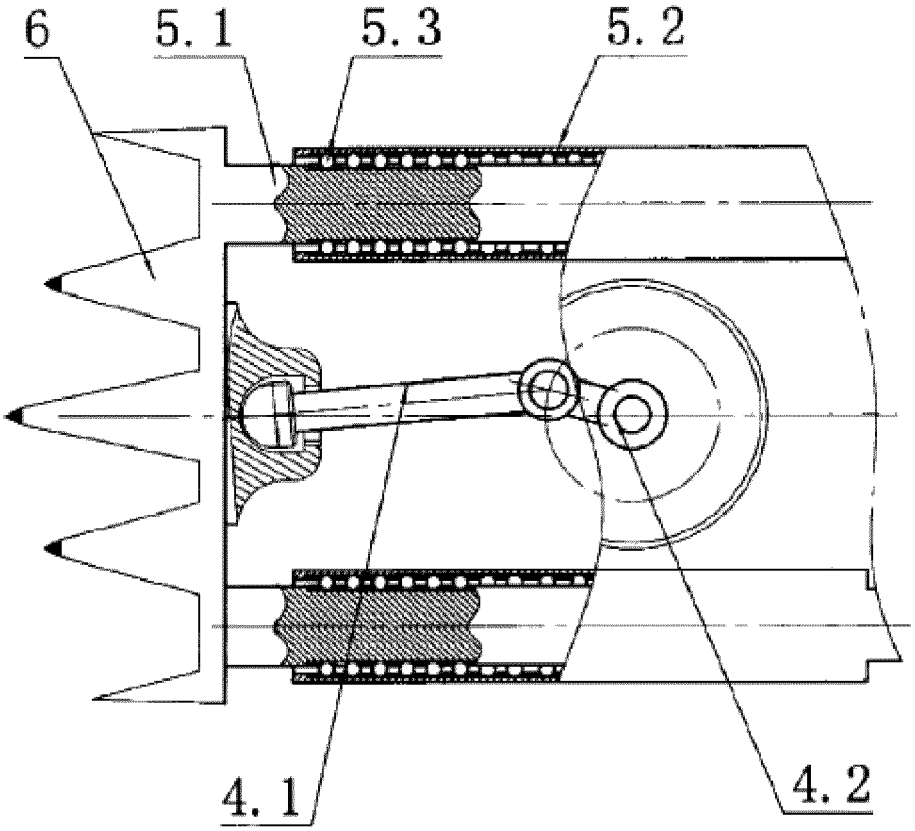


Fig. 107

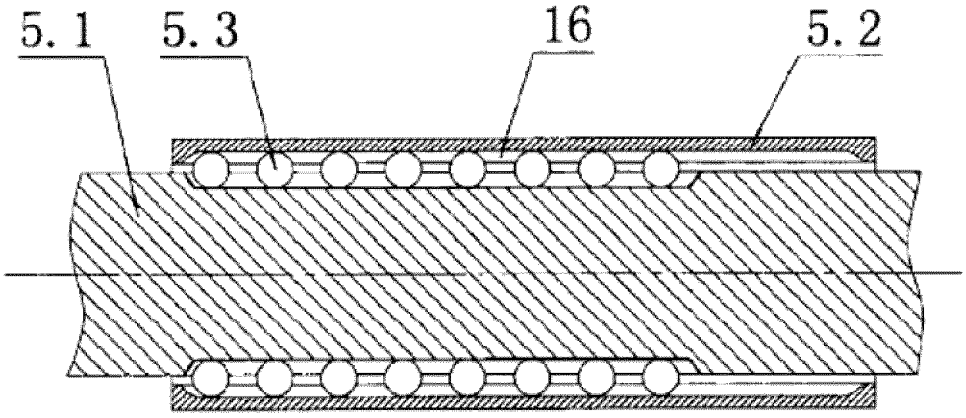


Fig. 108

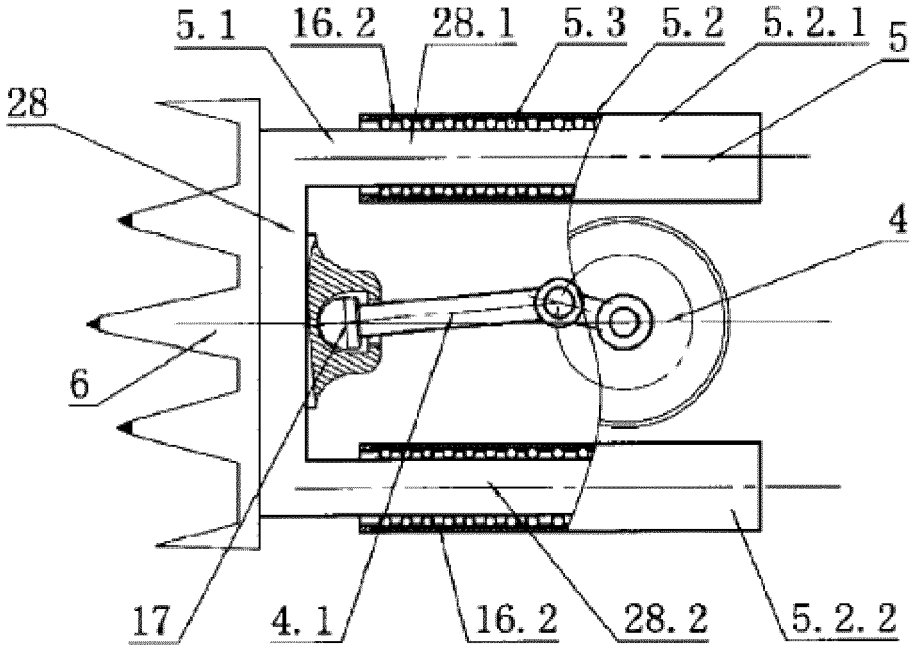


Fig. 109

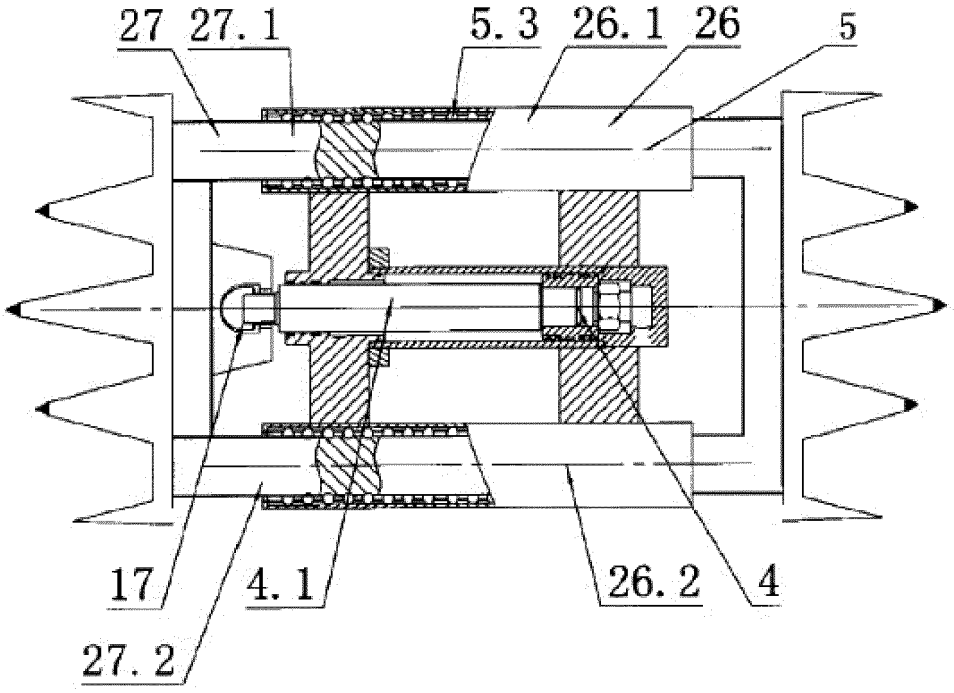
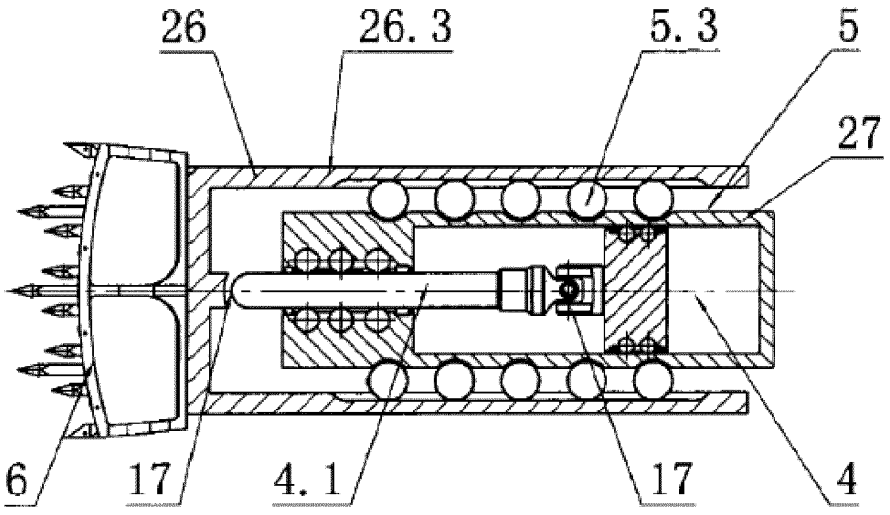


Fig. 110



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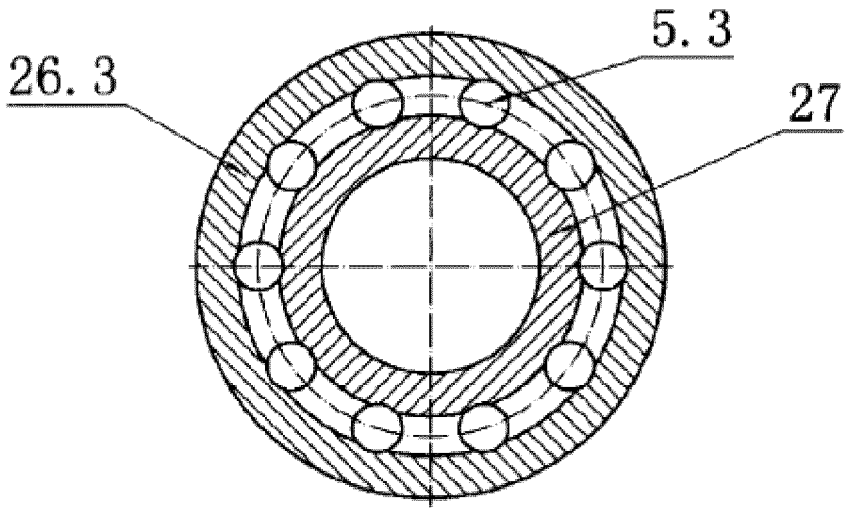


Fig. 112

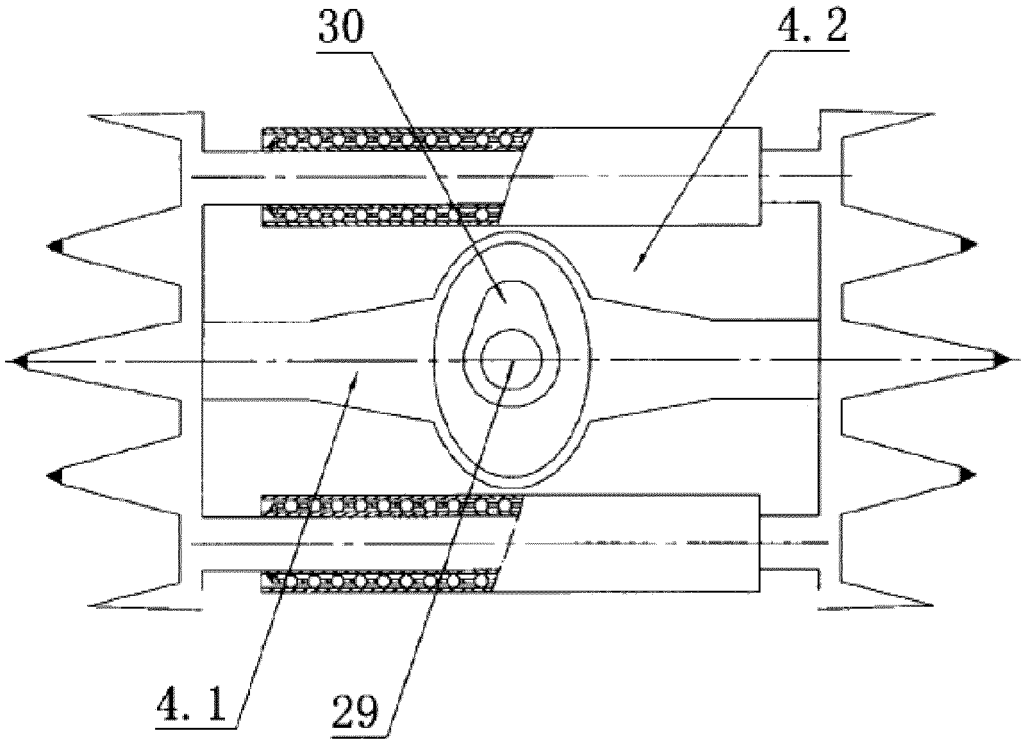


Fig. 113

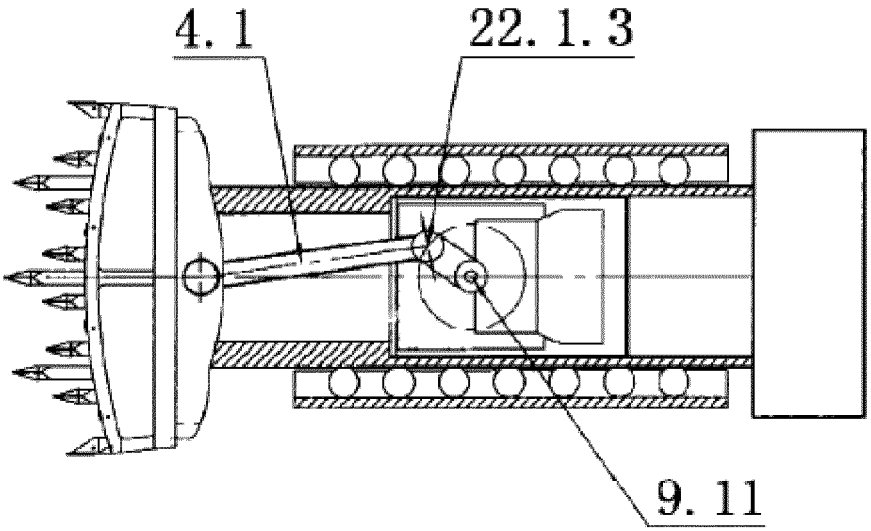


Fig. 114

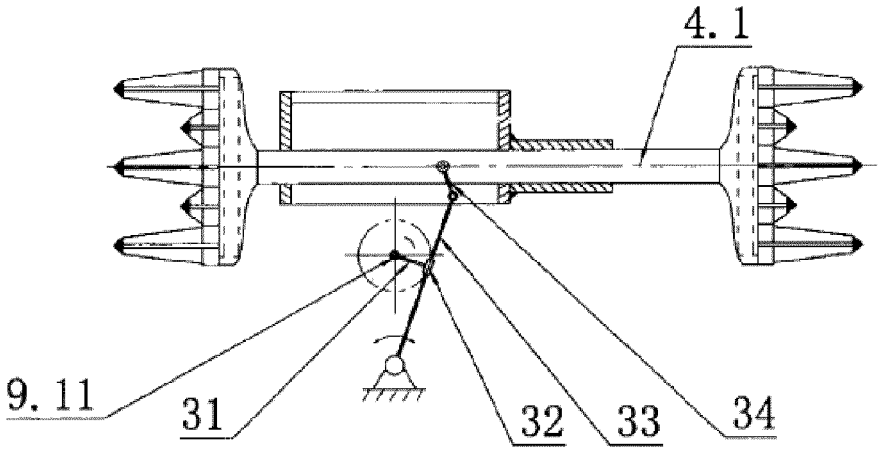


Fig. 115

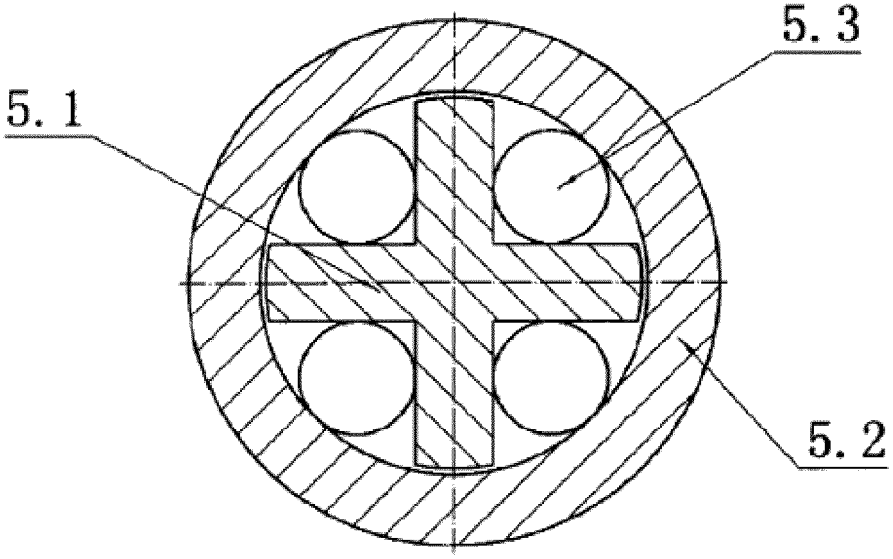


Fig. 116

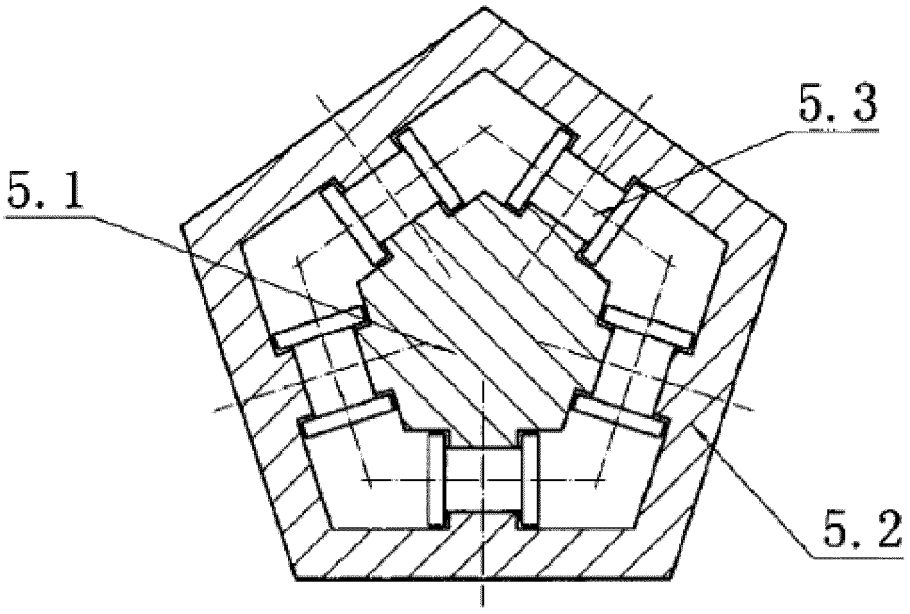


Fig. 117

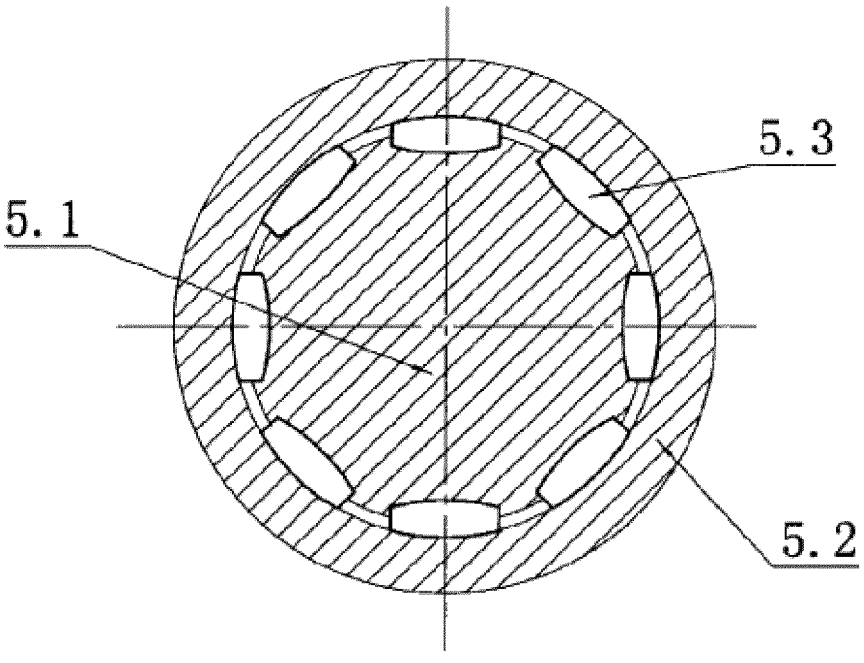


Fig. 118

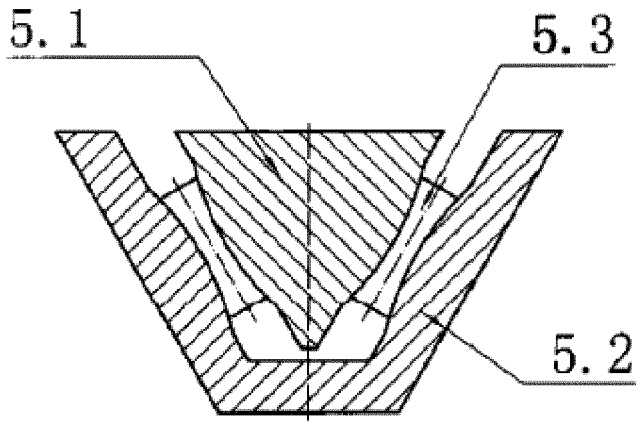


Fig. 119

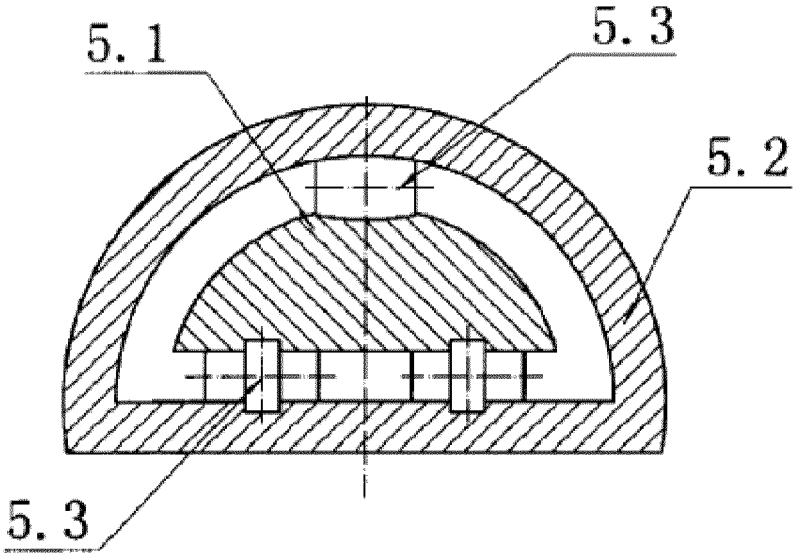


Fig. 120

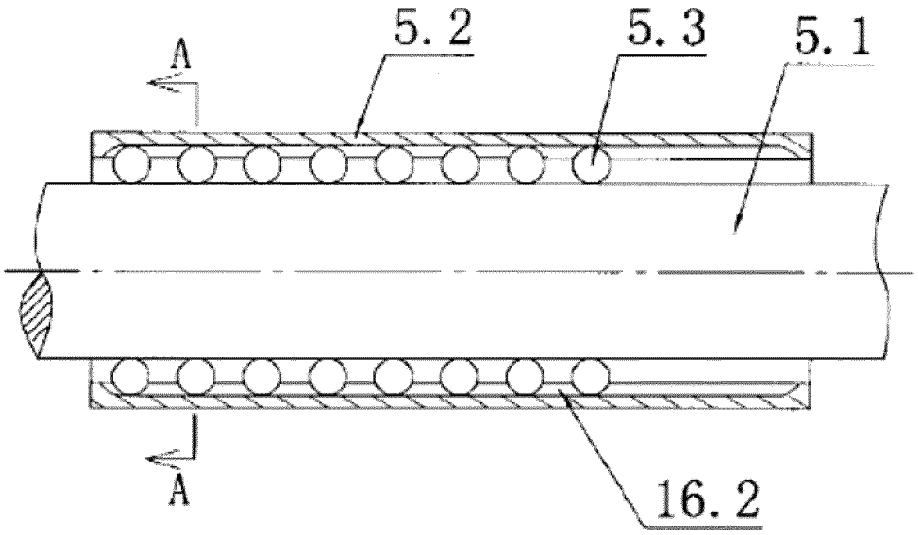
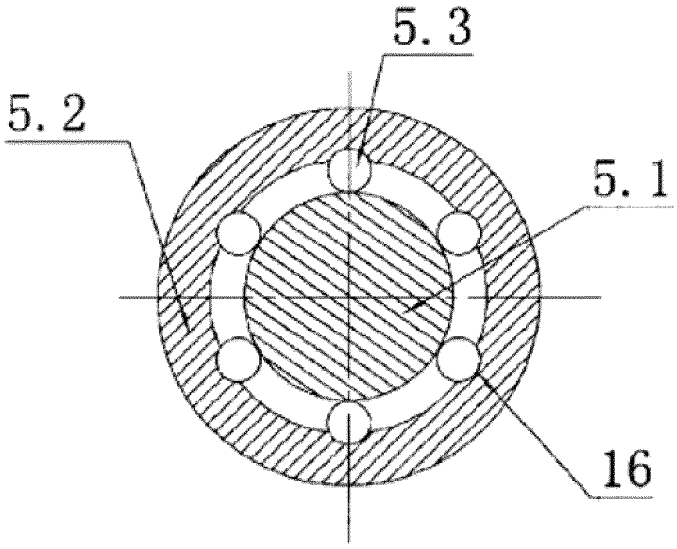


Fig. 121



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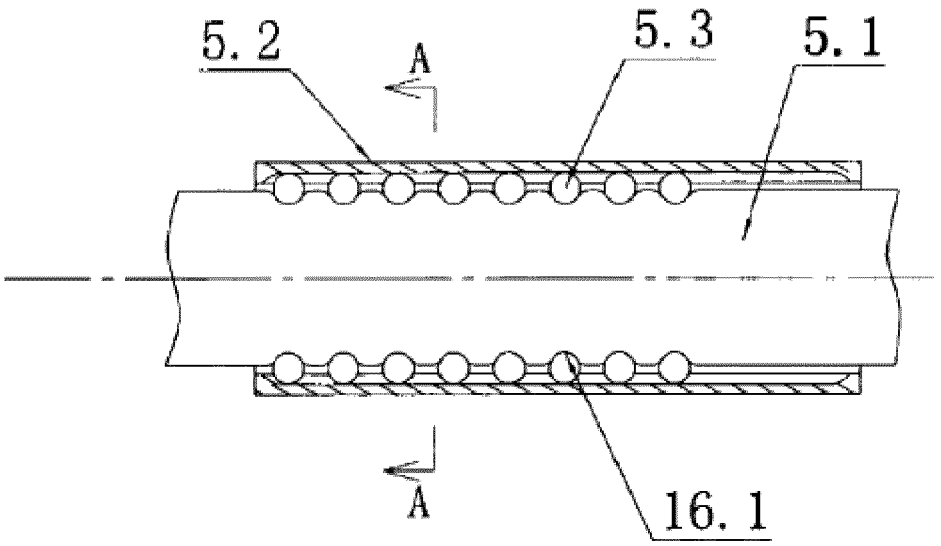


Fig. 123

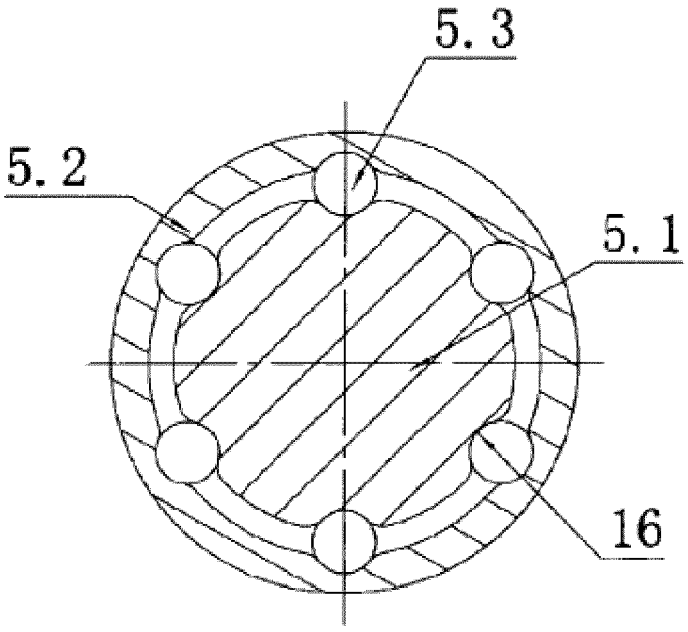


Fig. 124

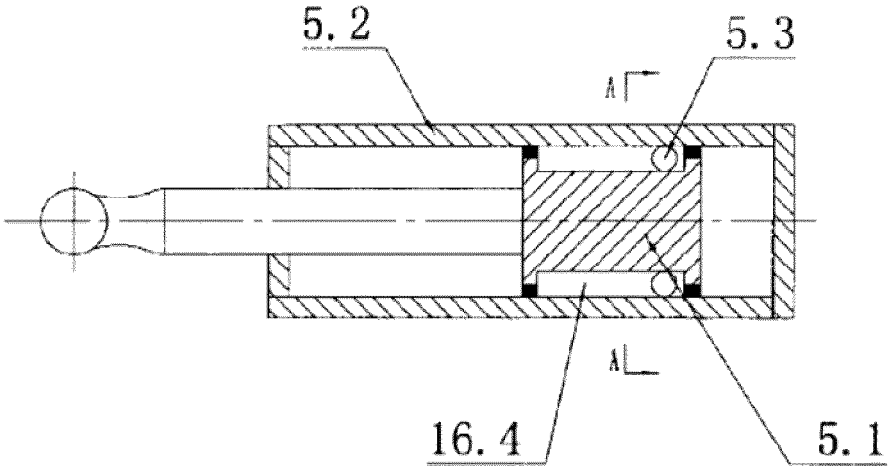


Fig. 125

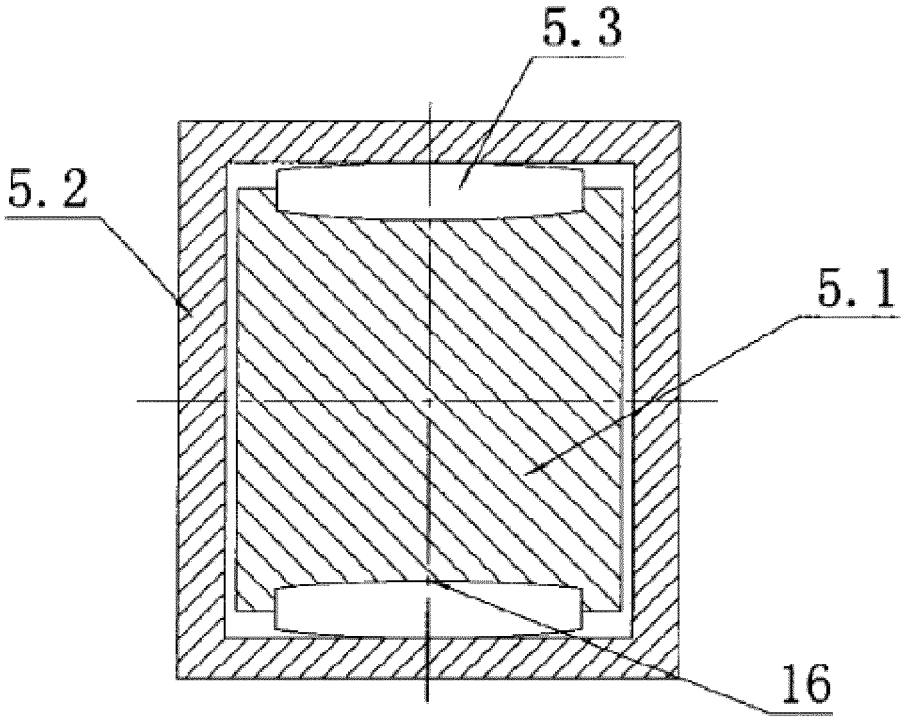


Fig. 126

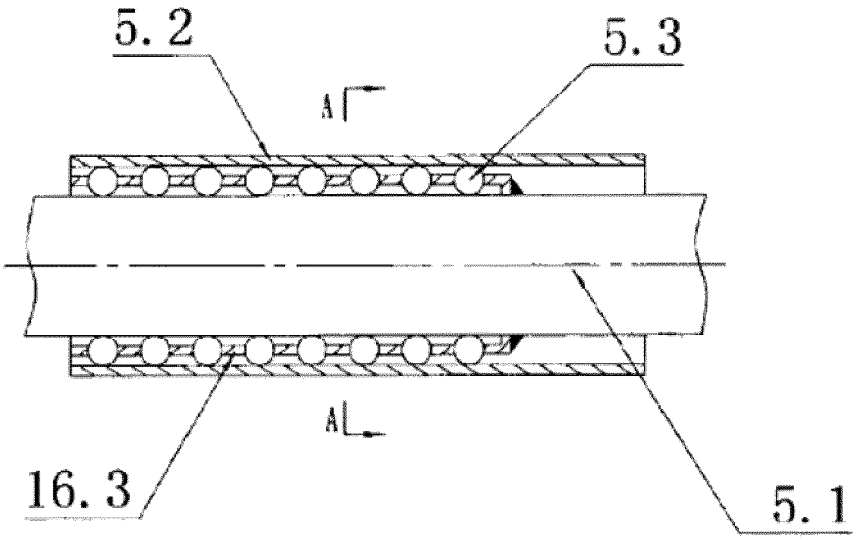
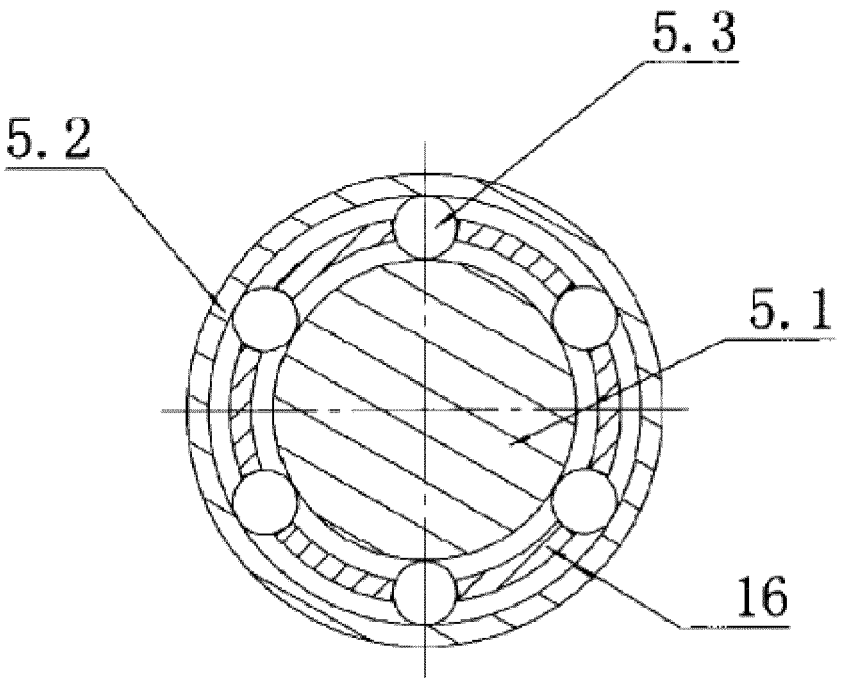


Fig. 127



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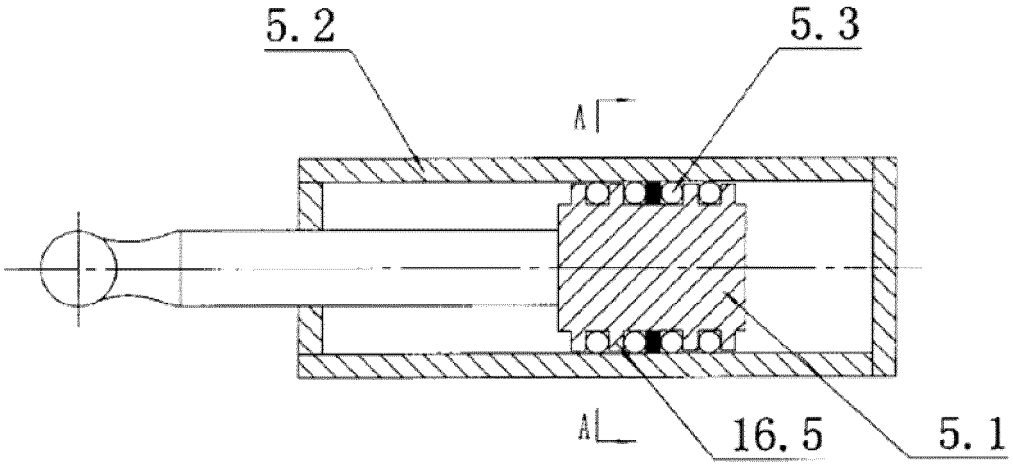

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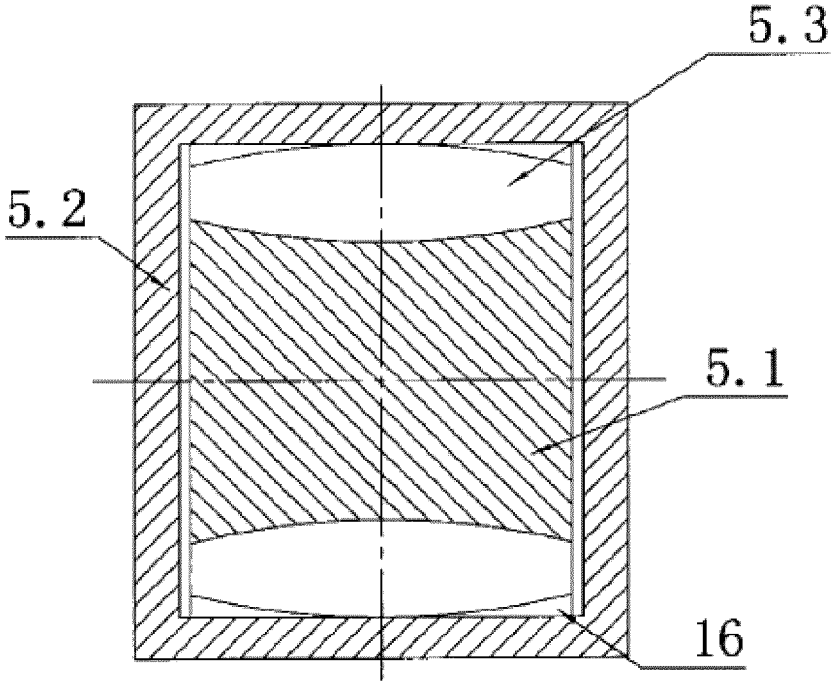

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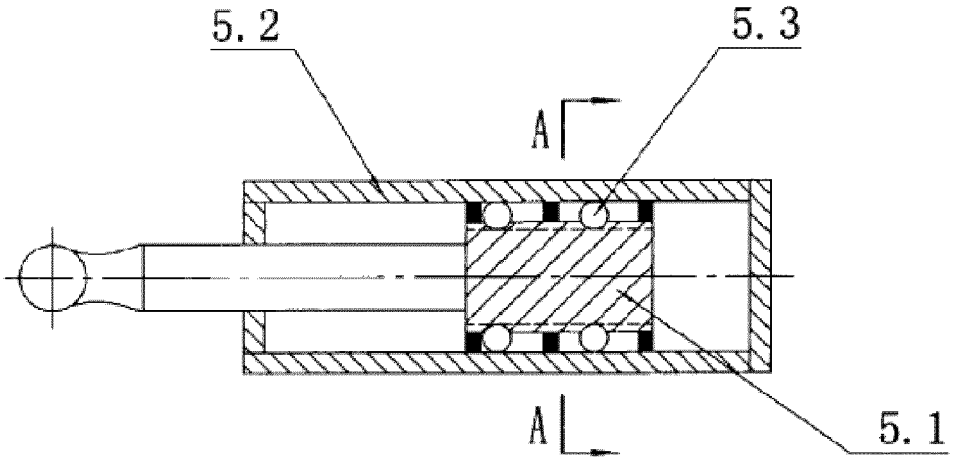

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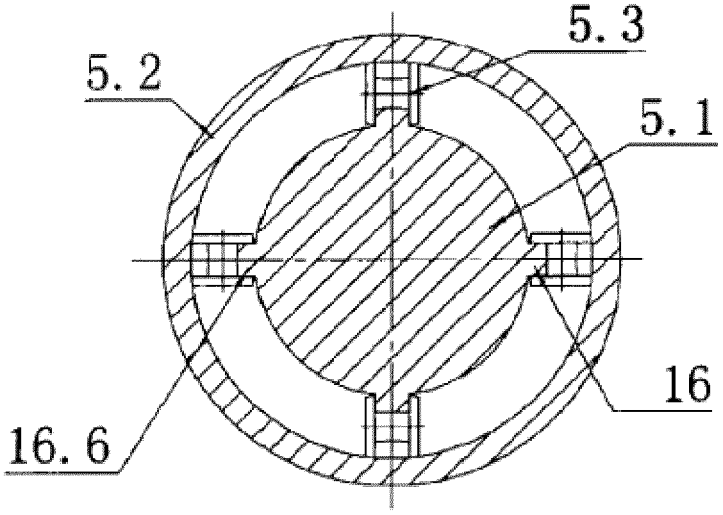

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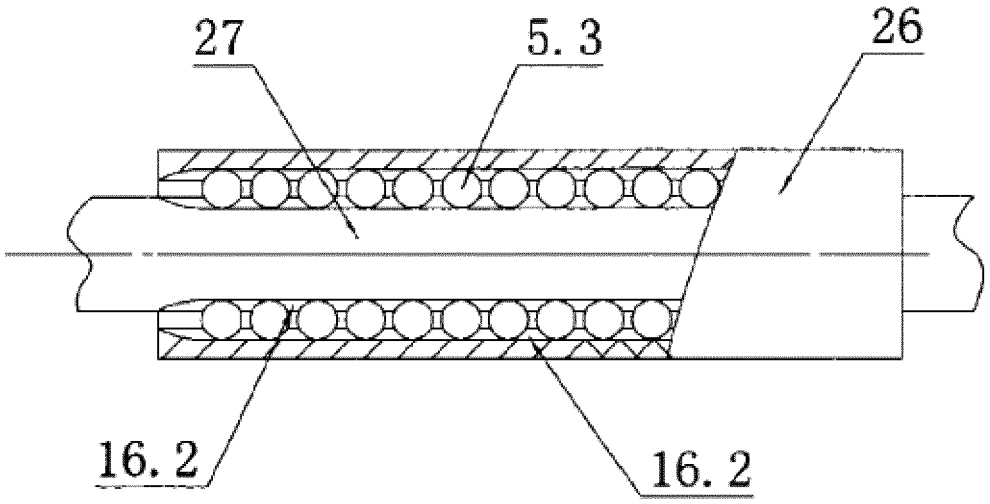

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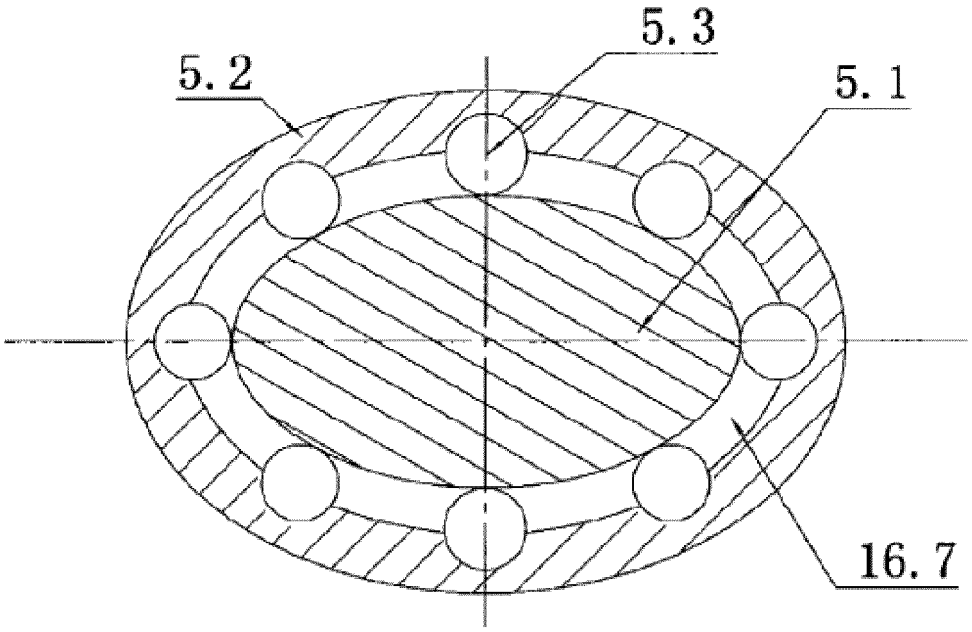

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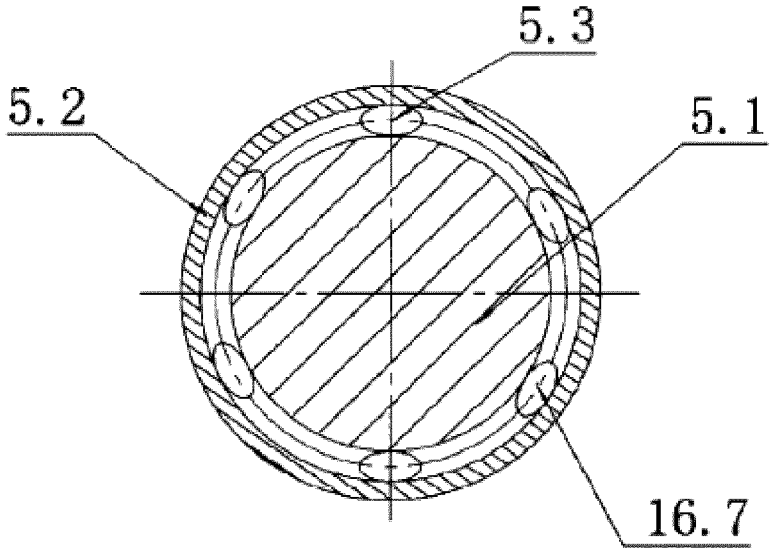

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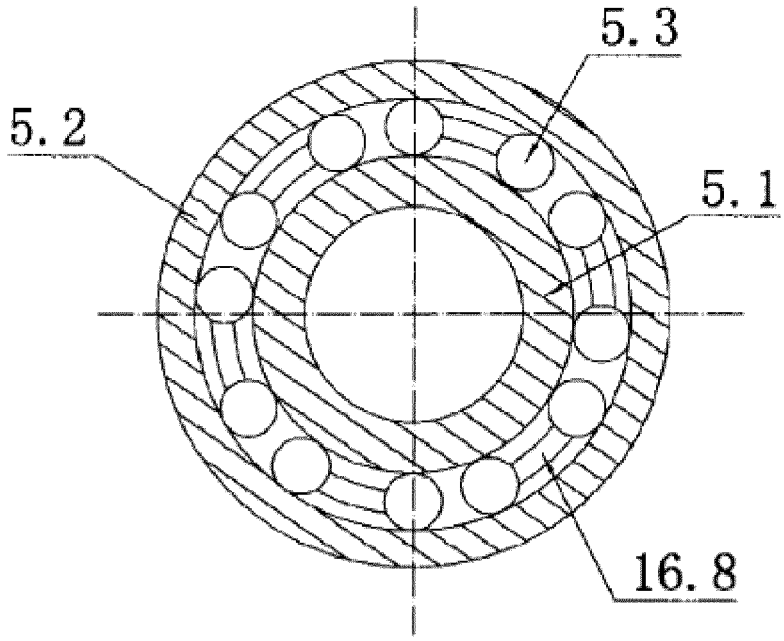

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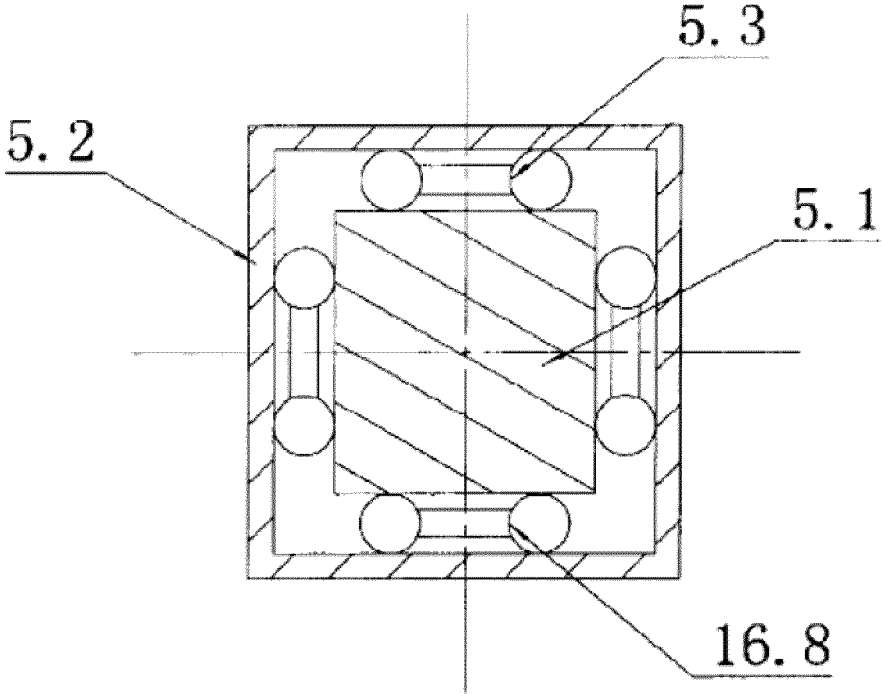

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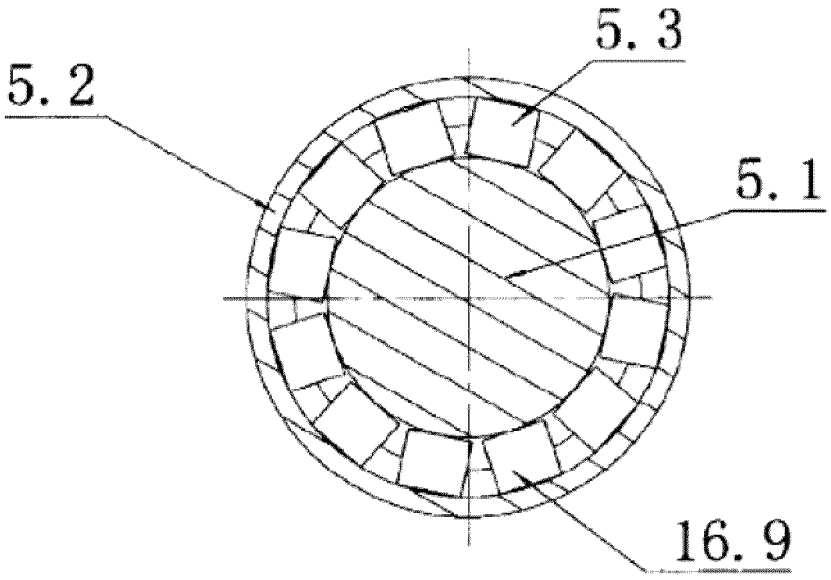

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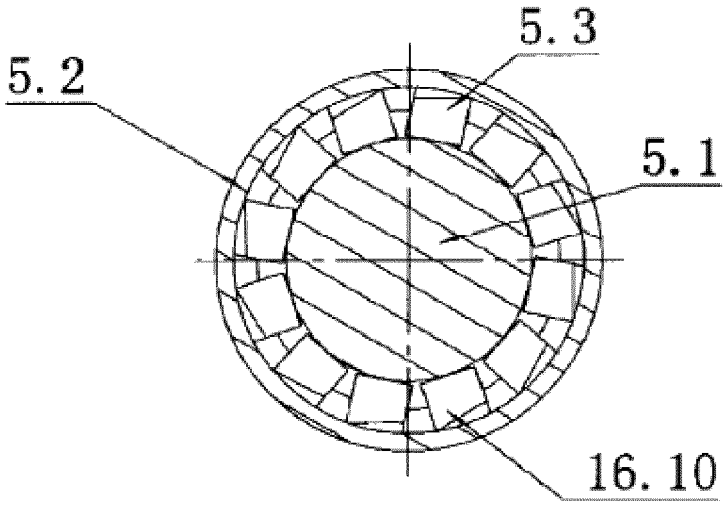

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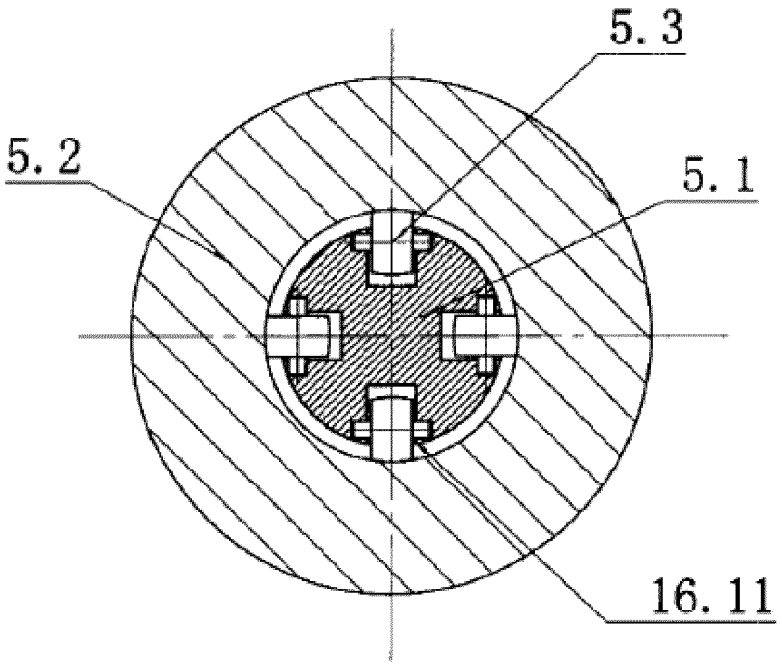

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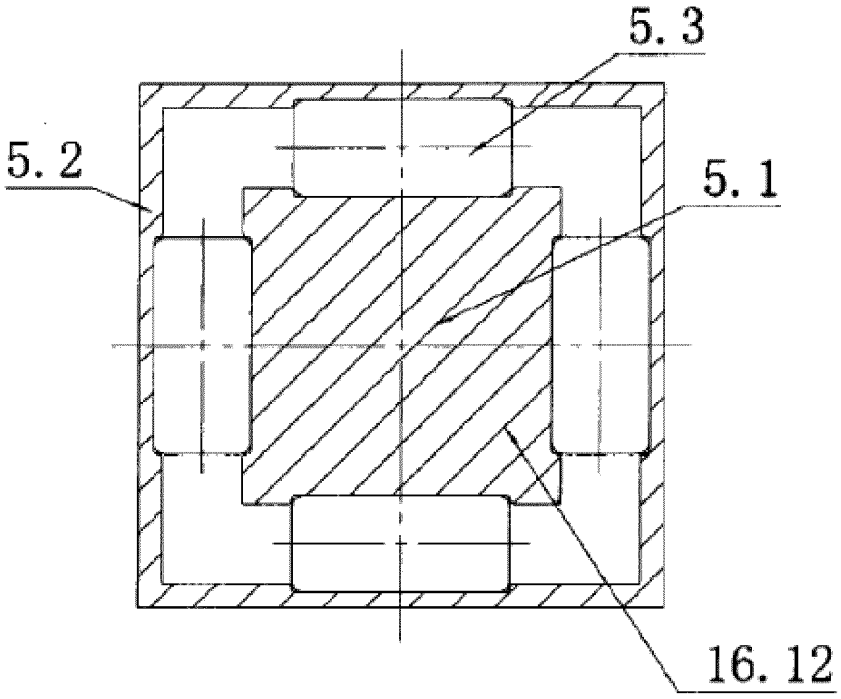
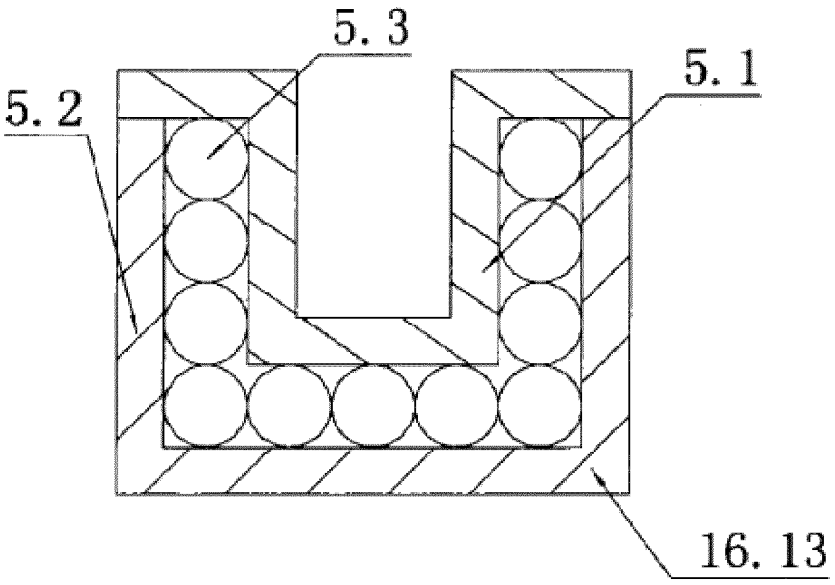


Fig. 141



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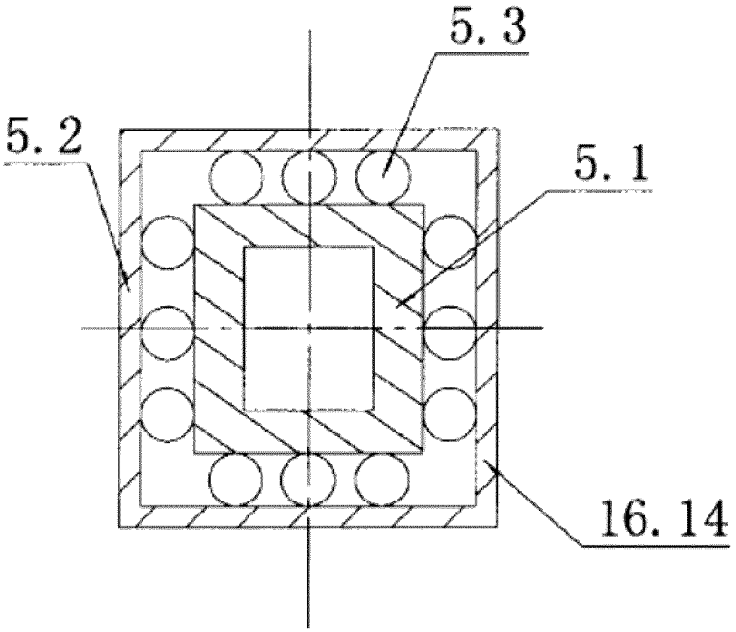


Fig. 143

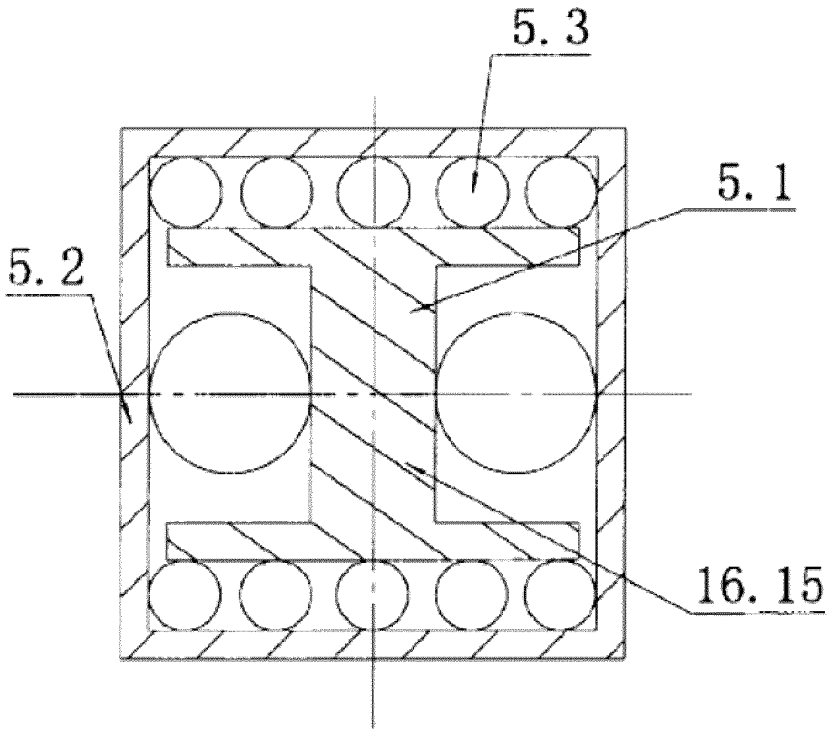
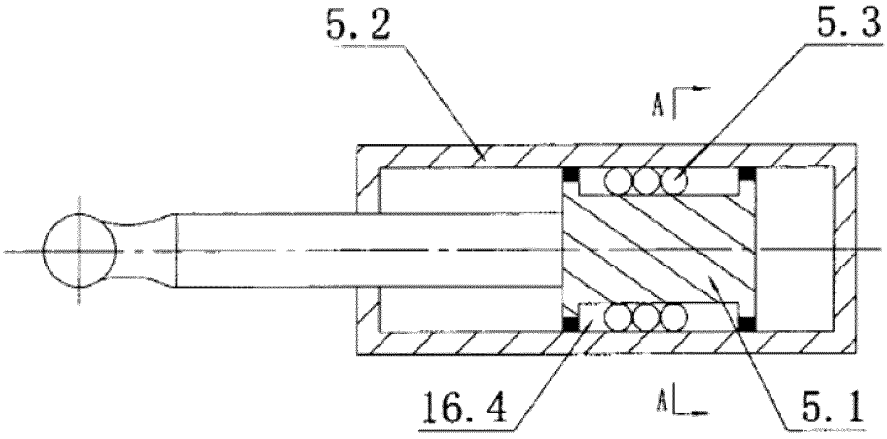


Fig. 144



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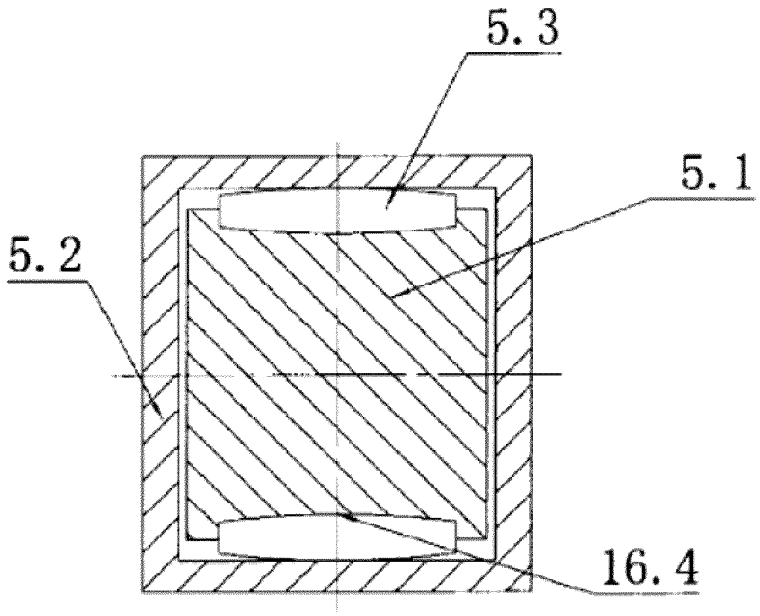

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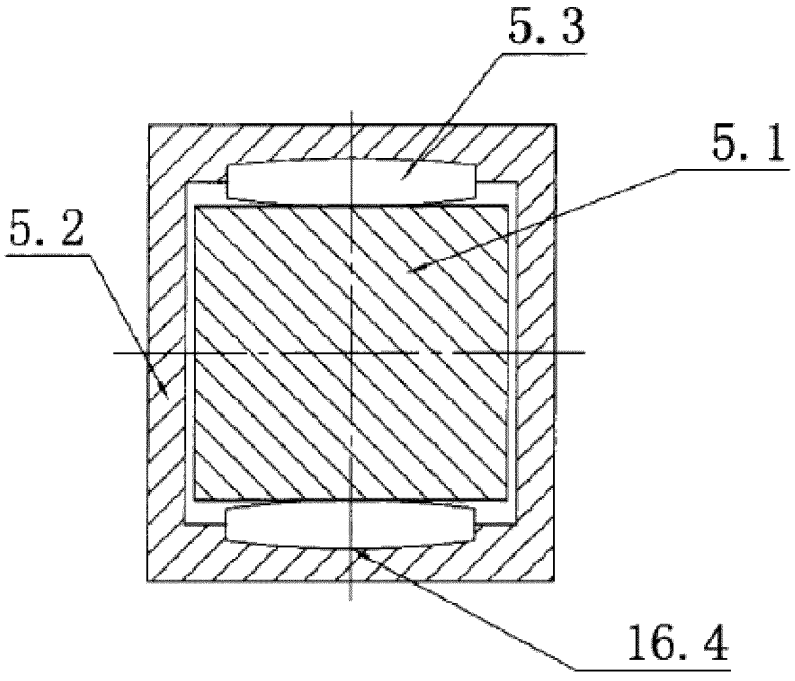
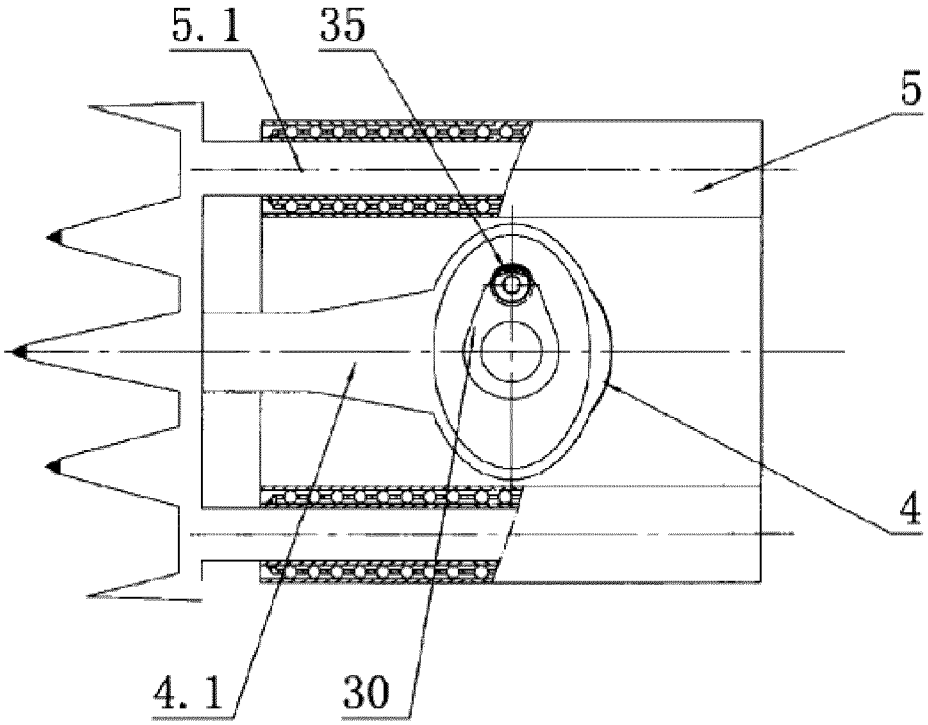


Fig. 147



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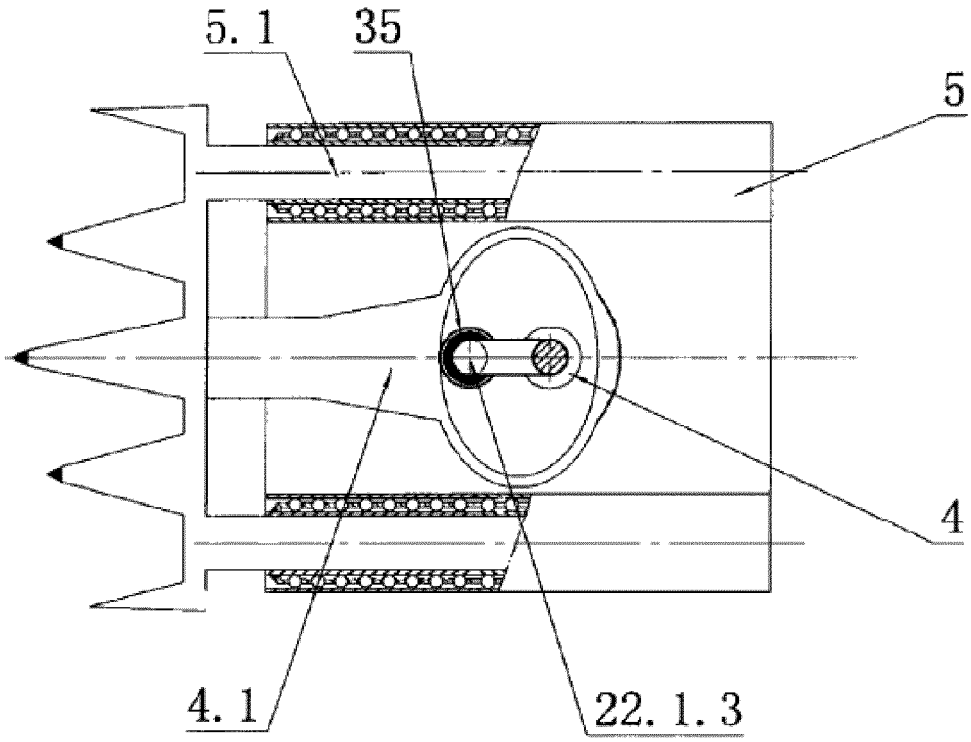

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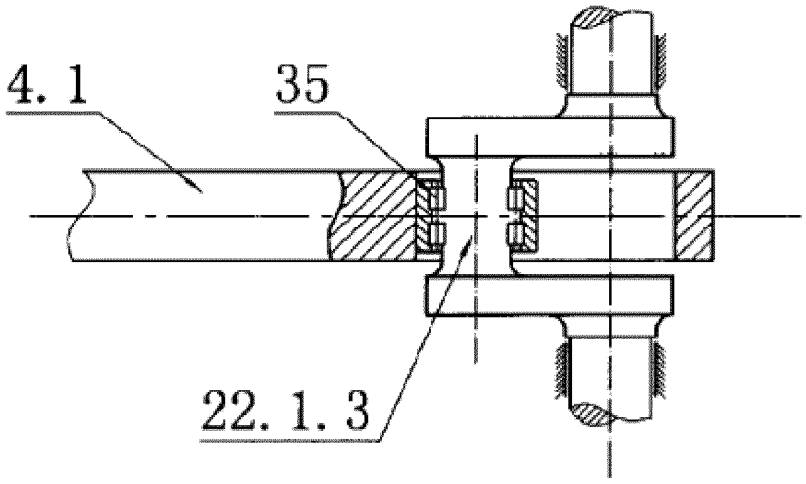

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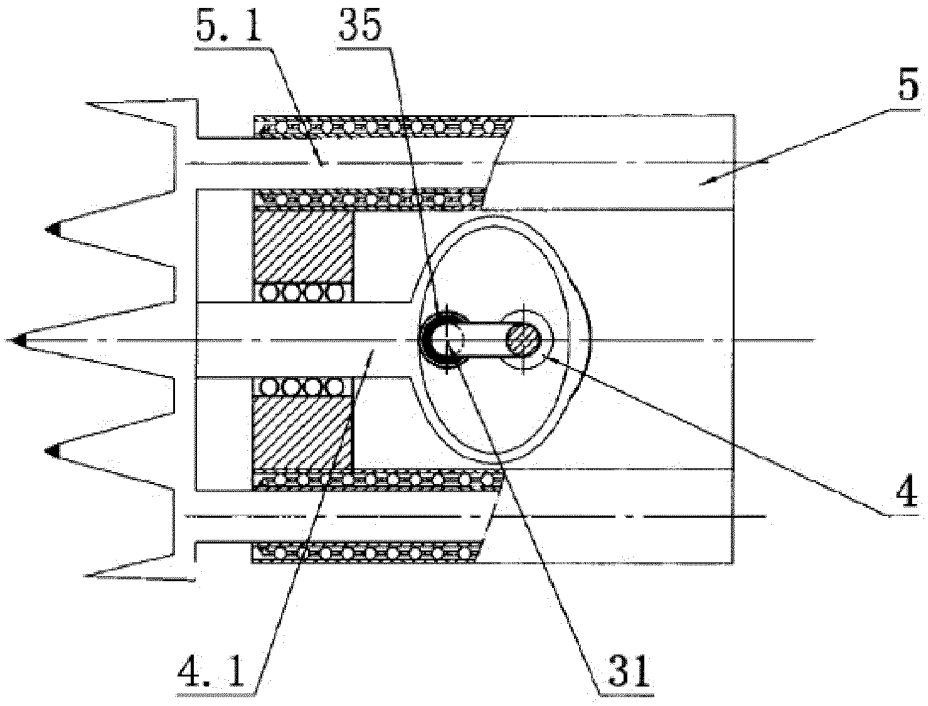

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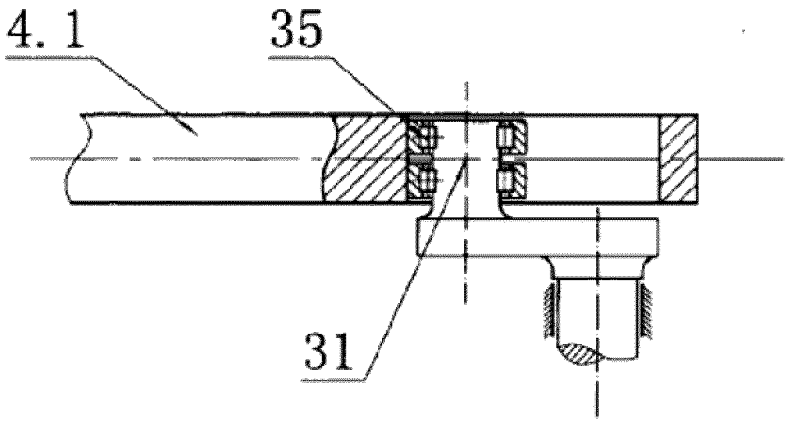

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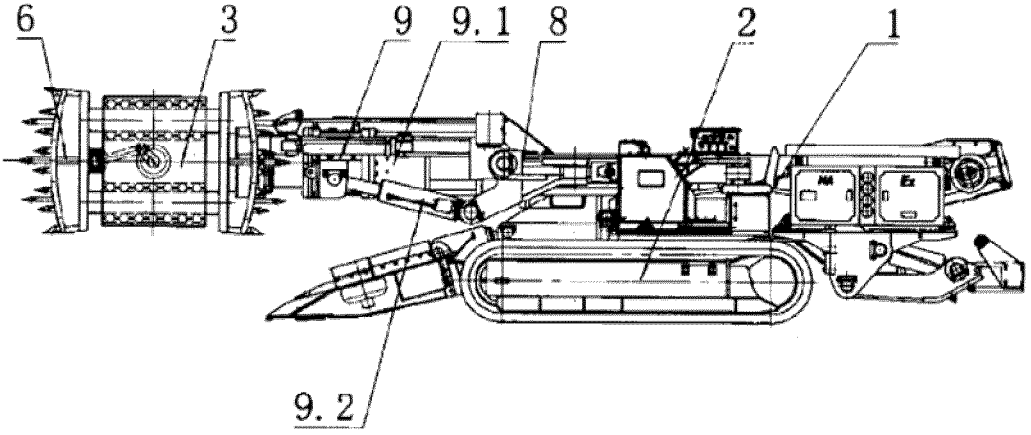

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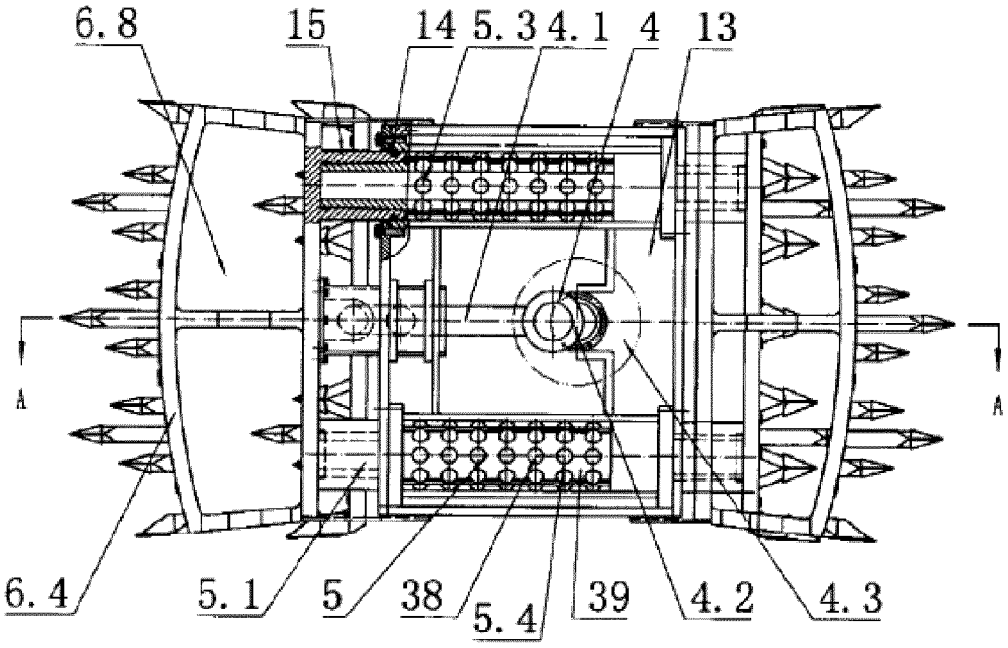

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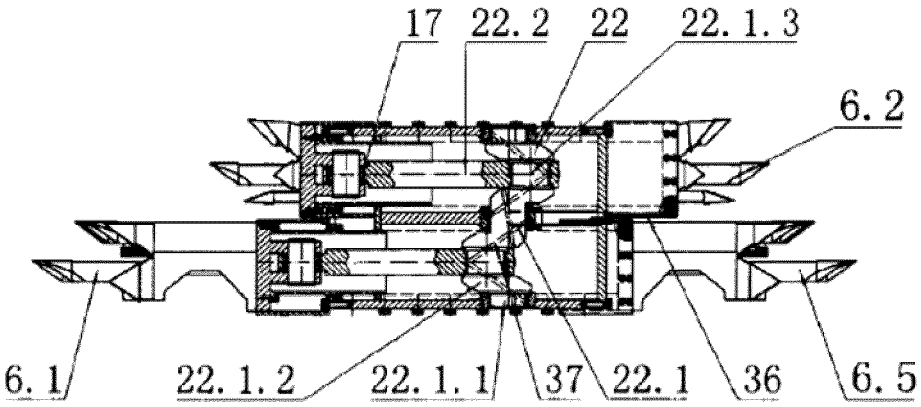

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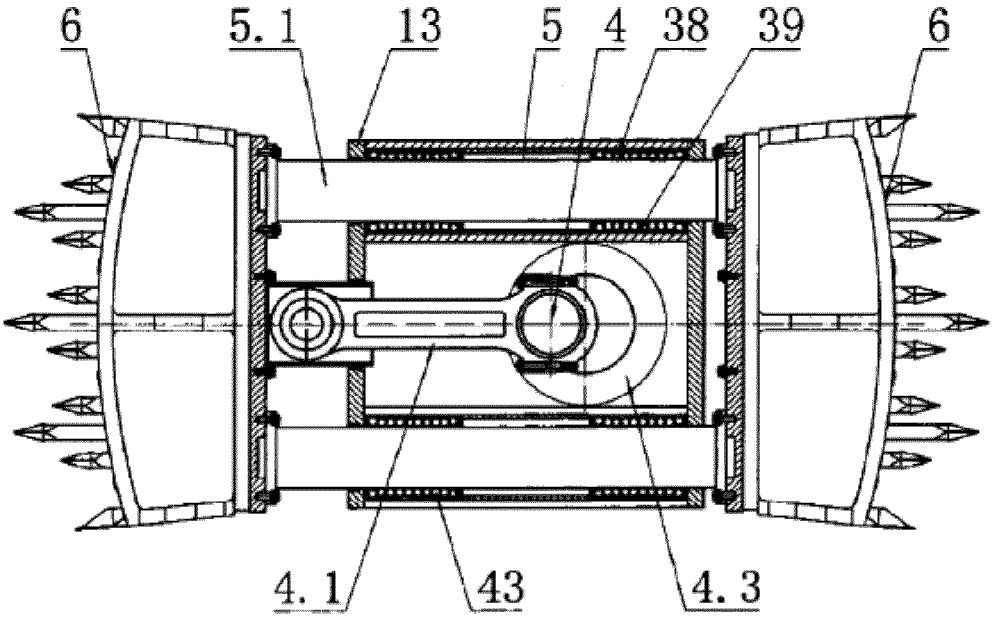

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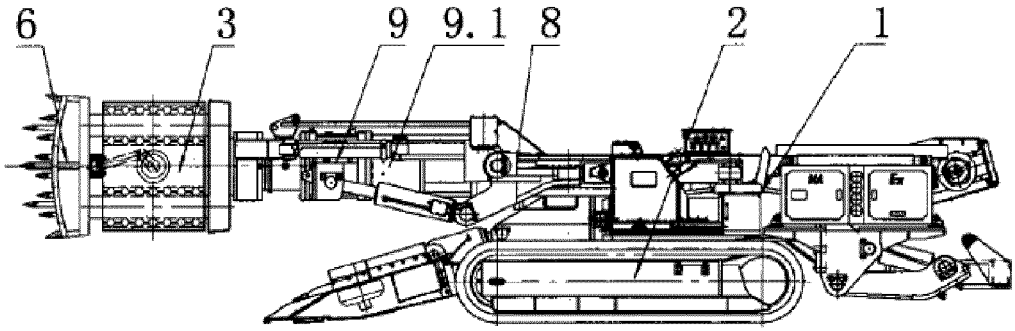

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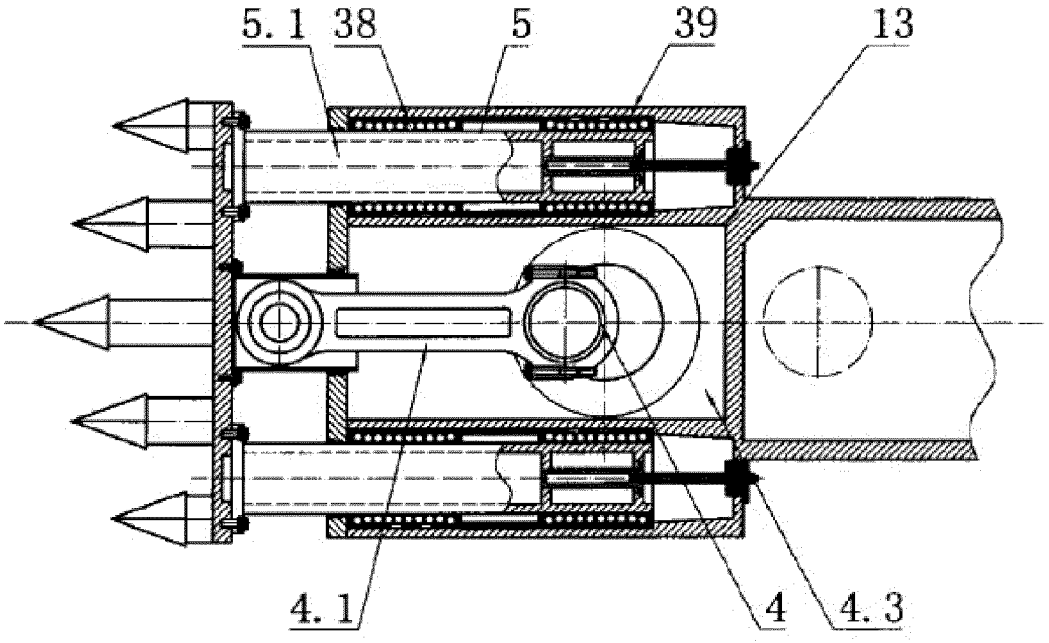

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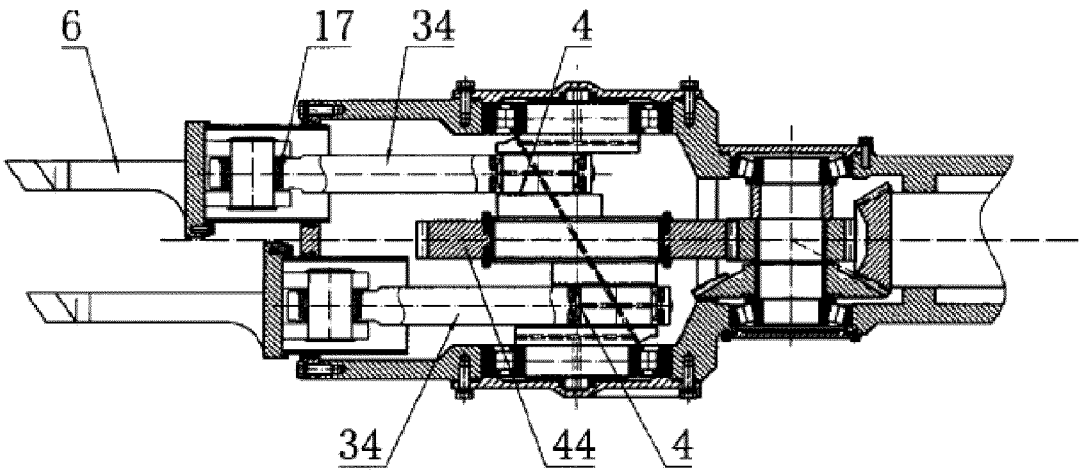

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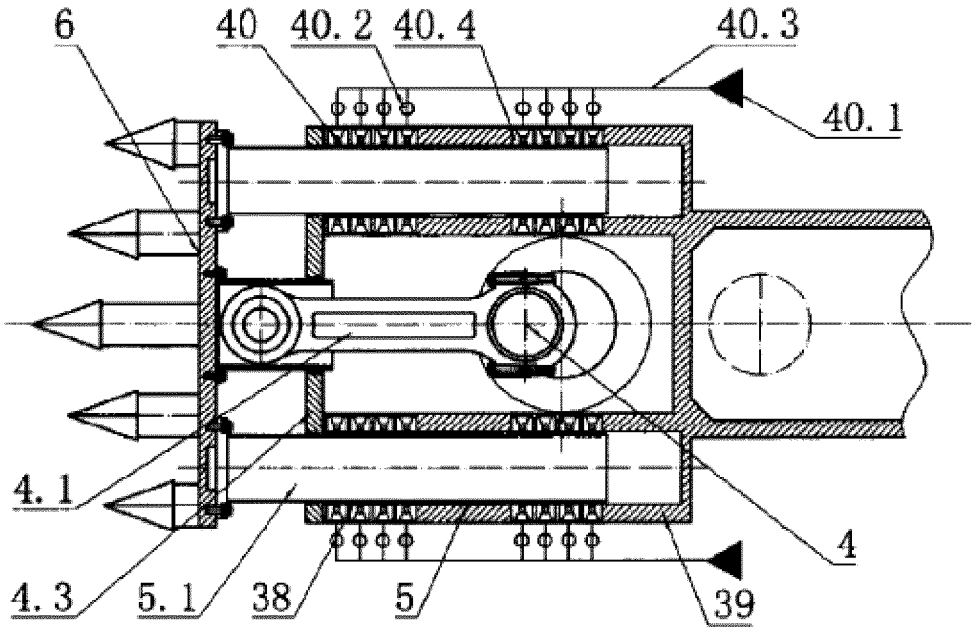

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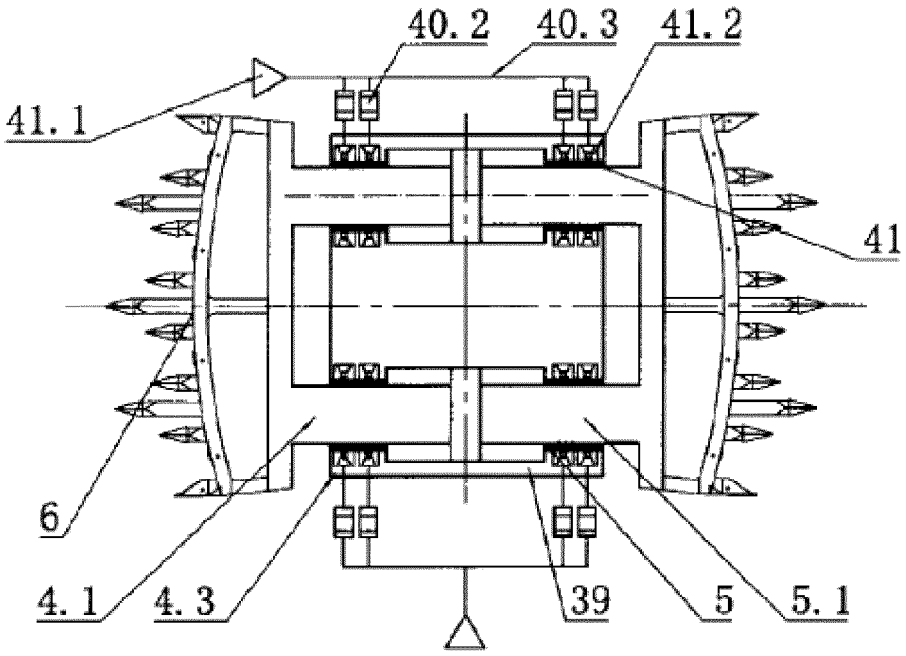

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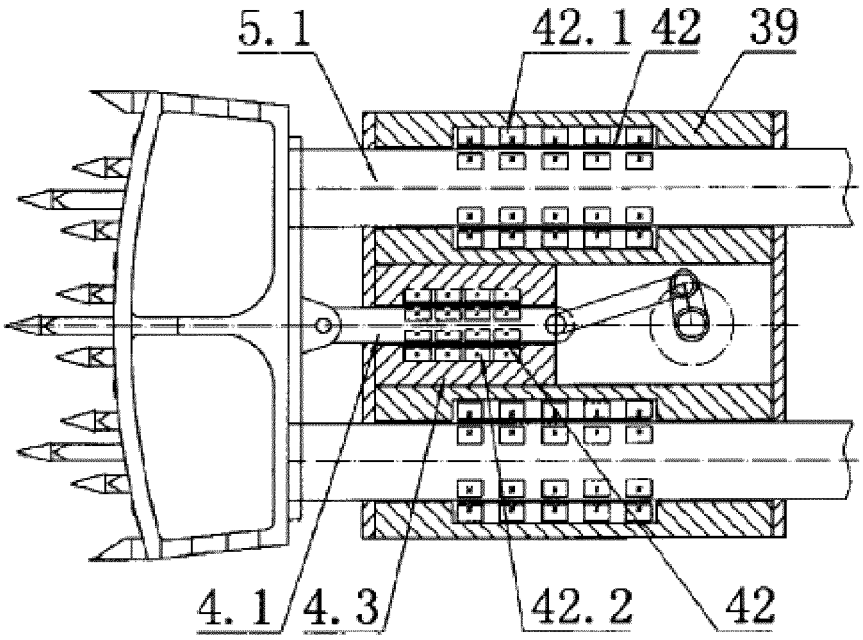

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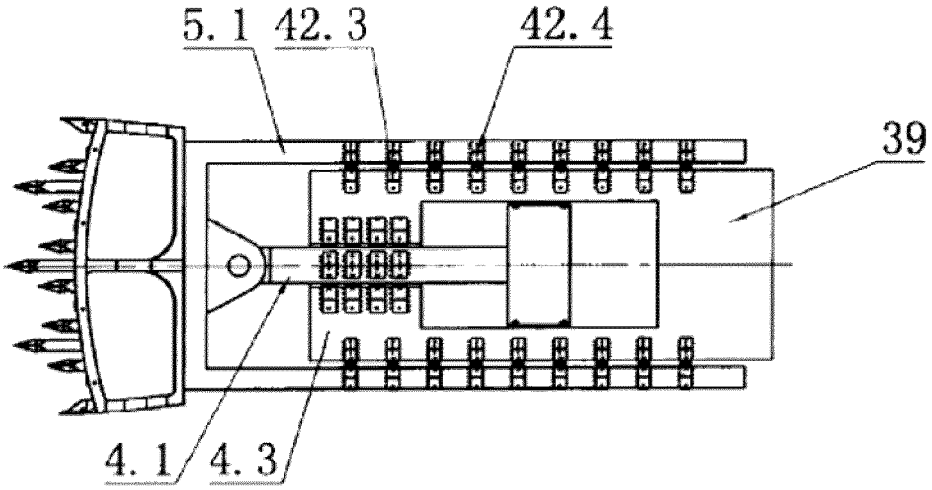
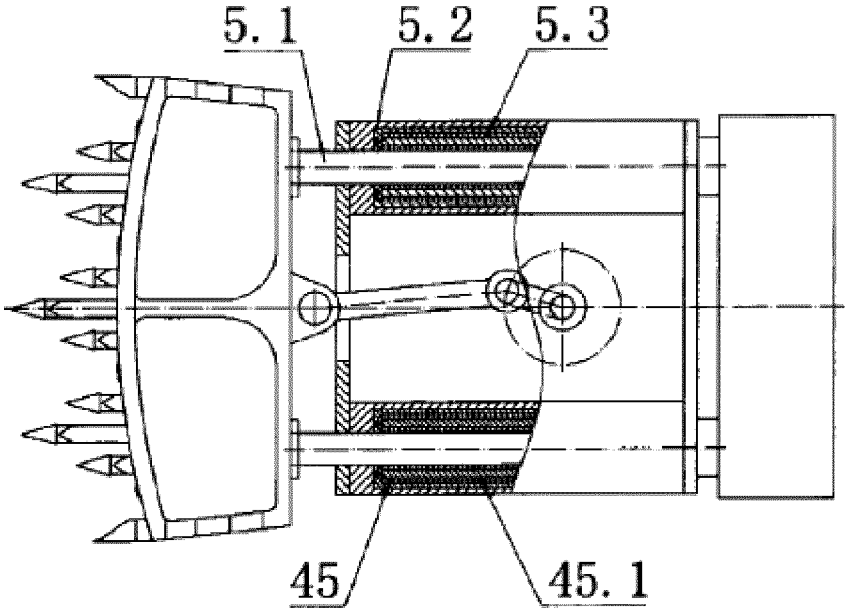


Fig. 163



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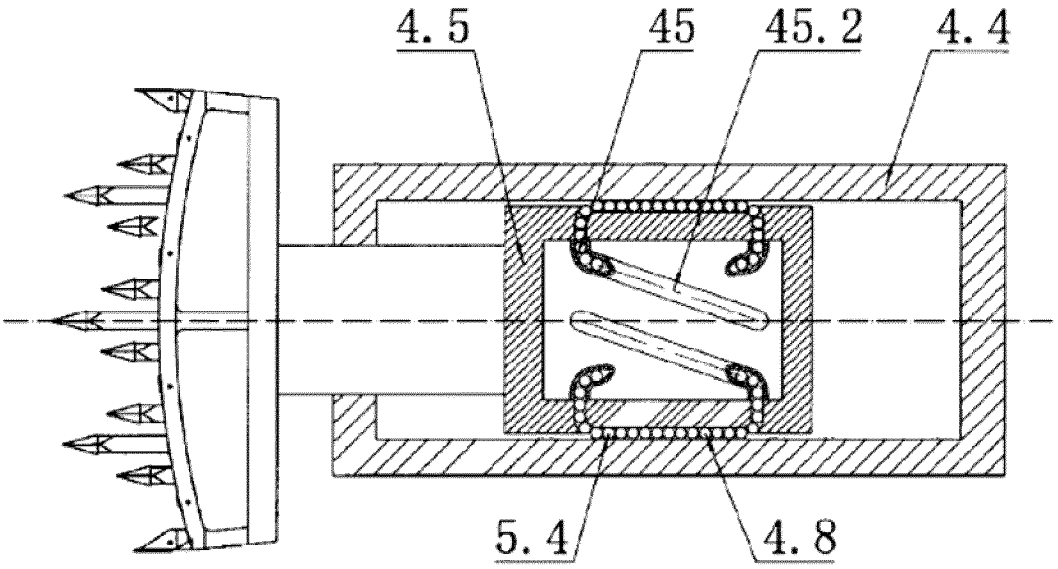

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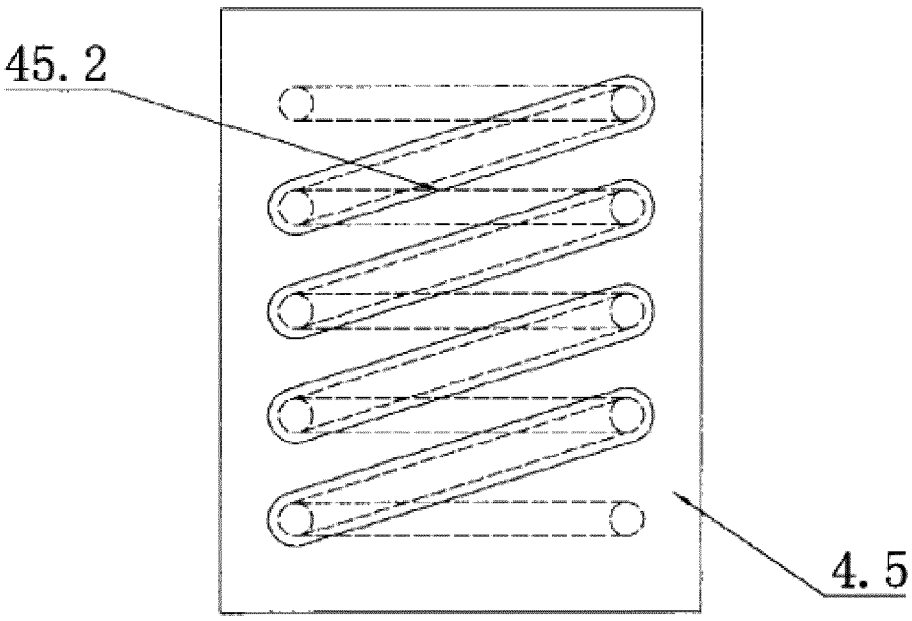

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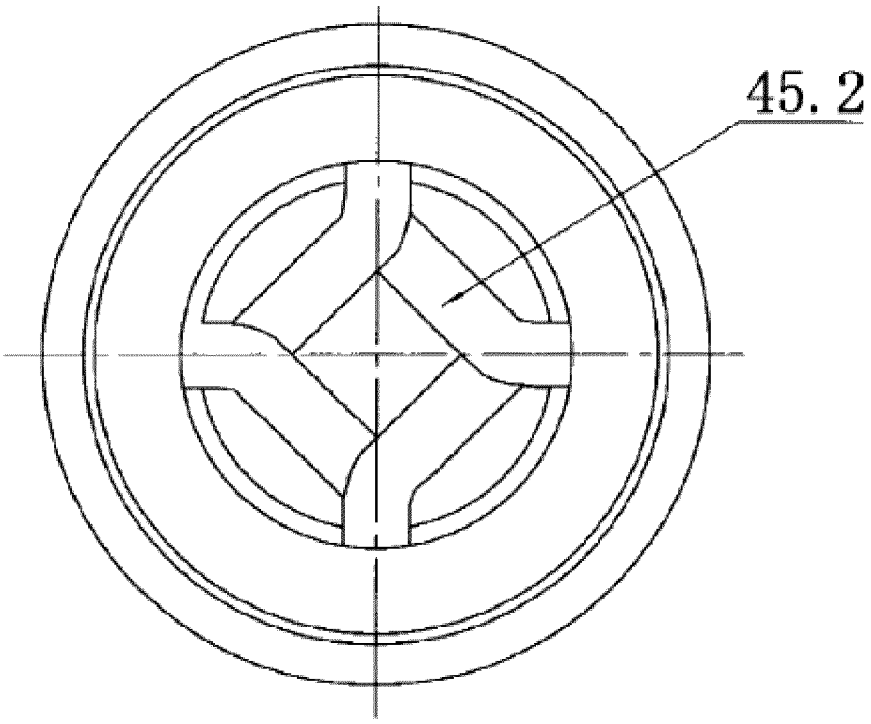


Fig. 167

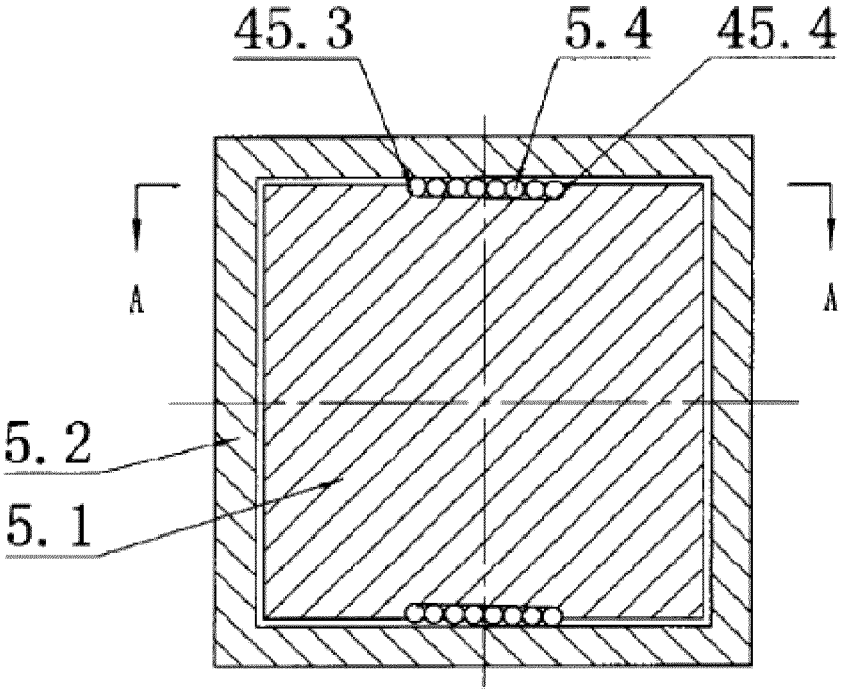


Fig. 168

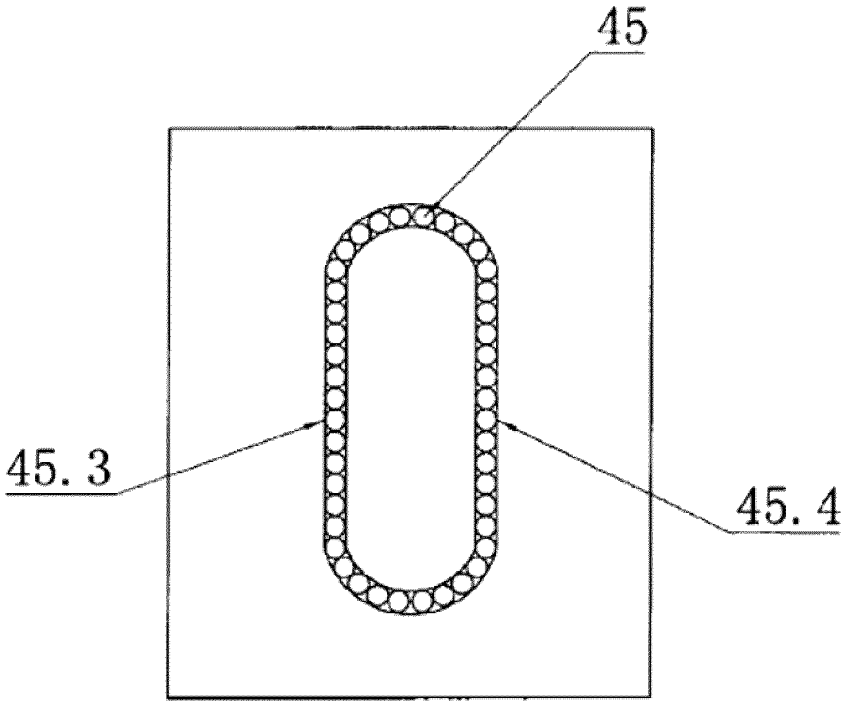
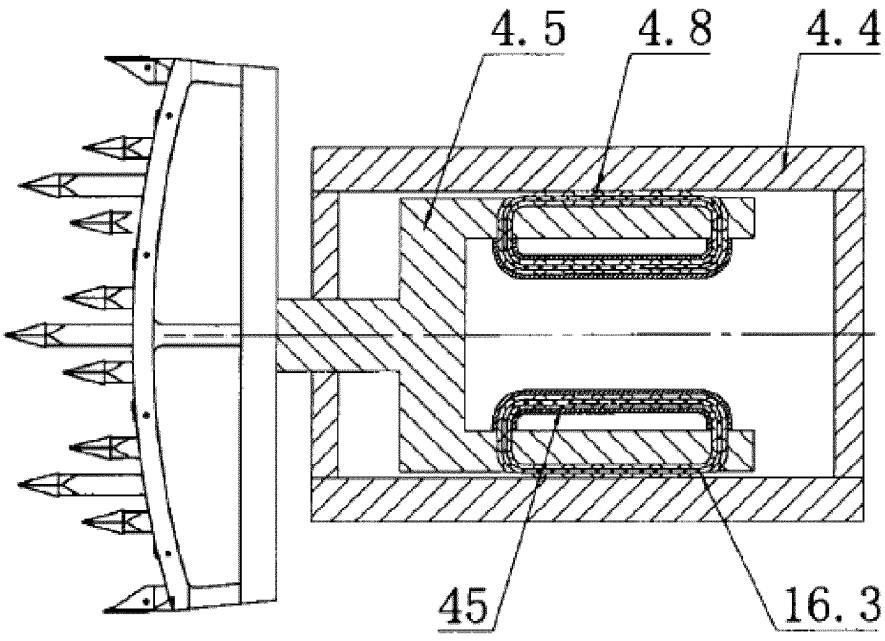


Fig. 169



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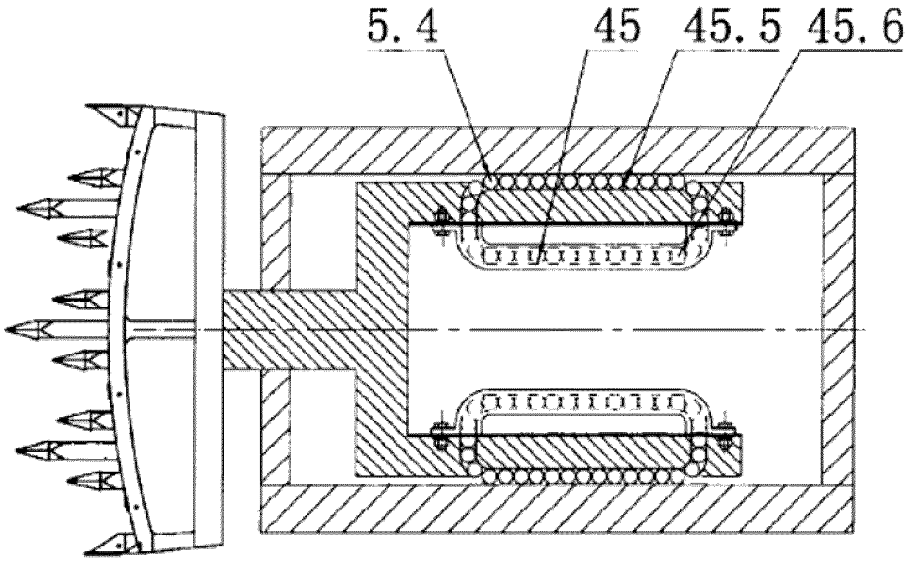

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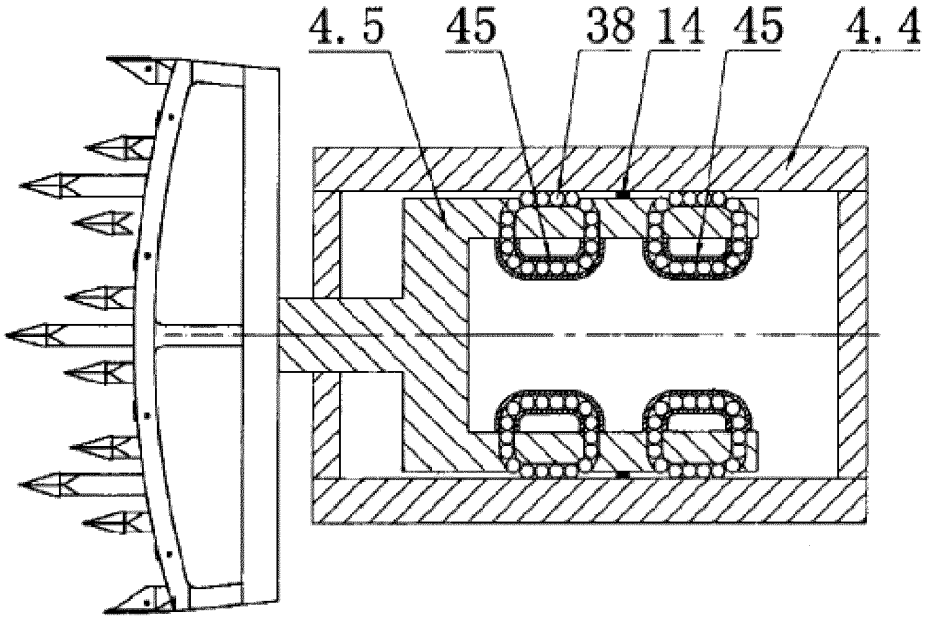

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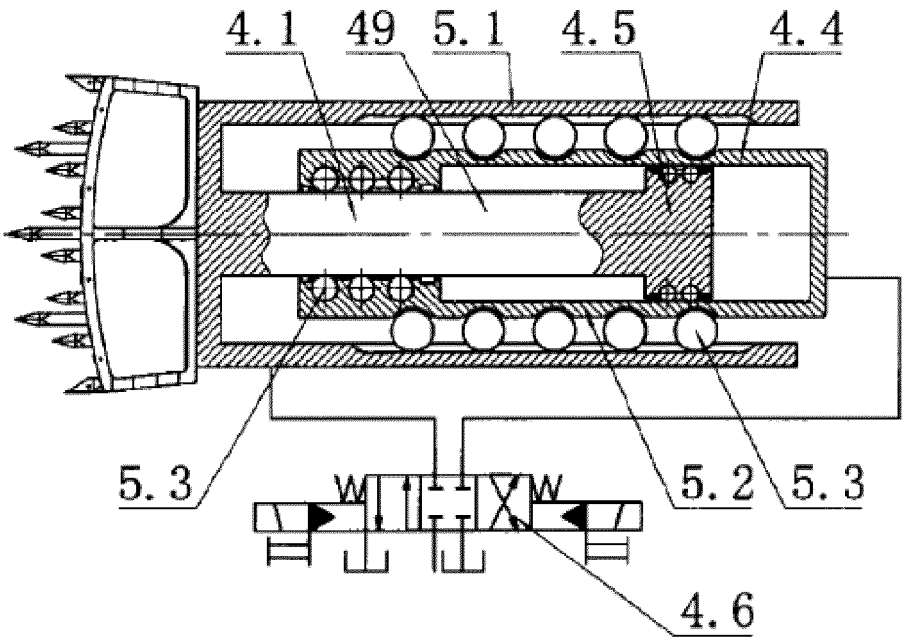

Fig. 173

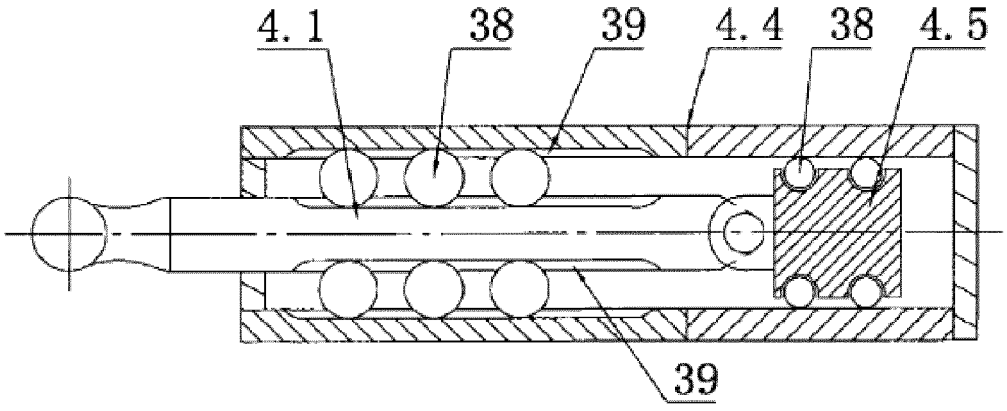

Fig. 174

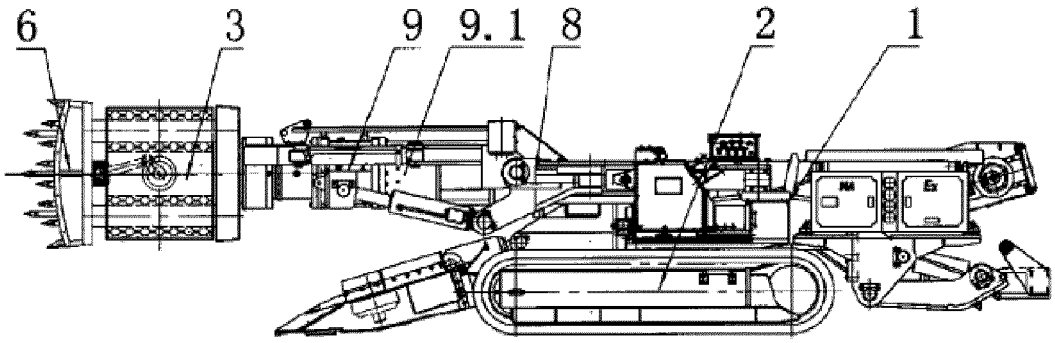

Fig. 175

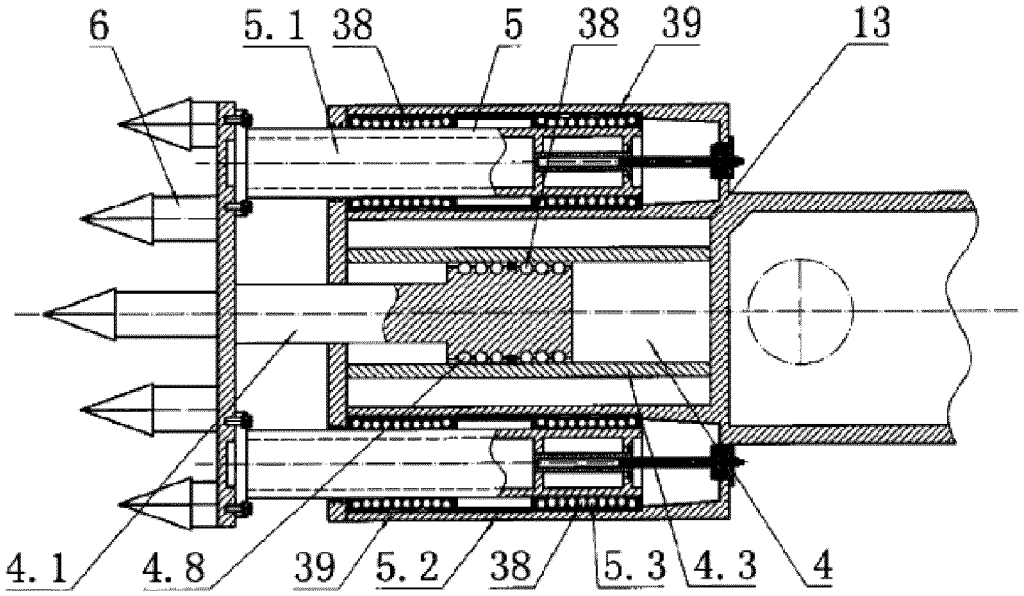

Fig. 176

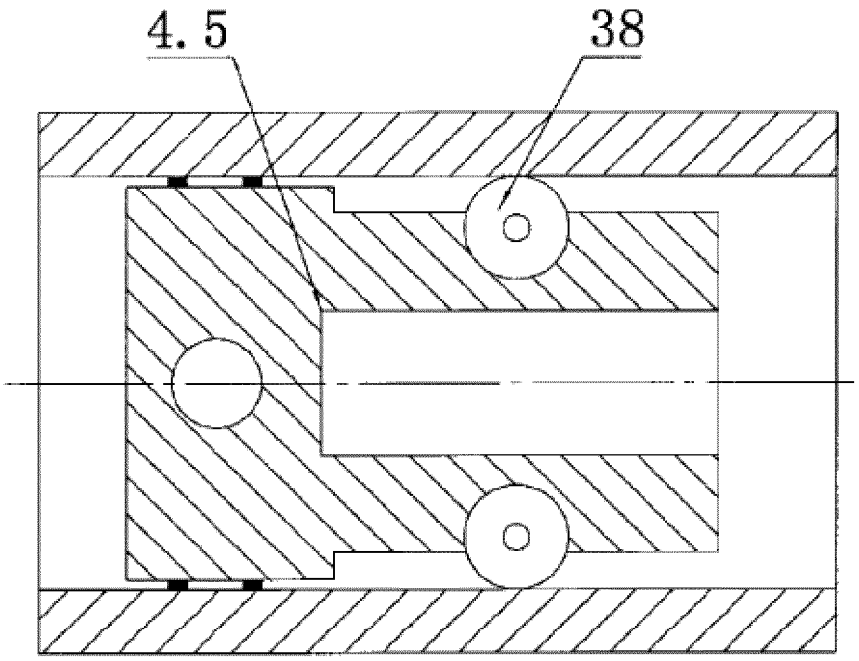

Fig. 177

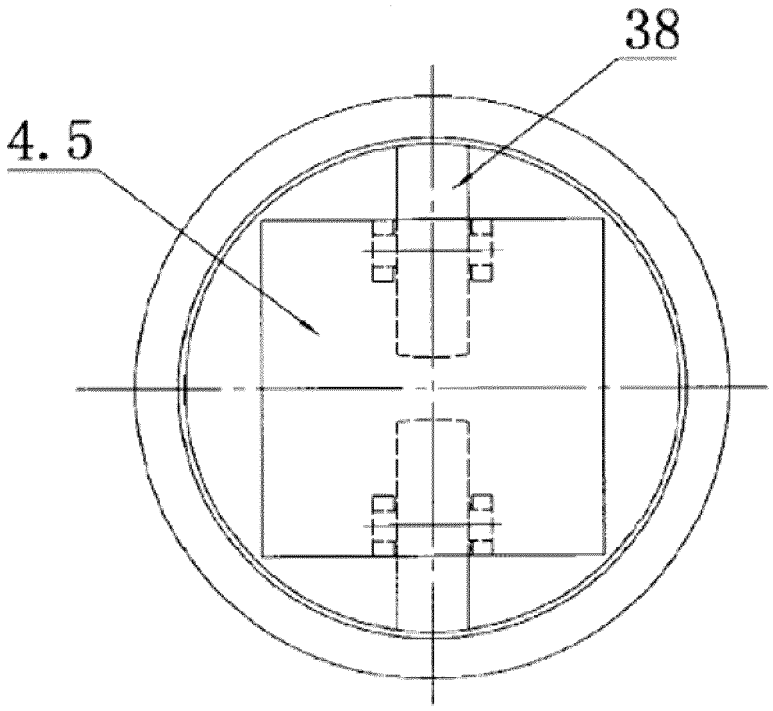

Fig. 178

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2013/000171

A. CLASSIFICATION OF SUBJECT MATTER

See the extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: E21B, E21C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNPAT, CNKI , WPI, EIPDOC GUID+, ROLLER?, ROLL+, FLOAT+, DRILL+, FRICTION, STRIK, IMPACT, SHOCK, BREAK, PERCUSS+, RECIPROCAT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 87105404 A (SALZGITTER MASCH & ANLAGEN AG) 17 February 1988 (17.02.1988) the thirst paragraph of page four to the forth paragraph of page seven of description, figures 1-3	1-189
A	CN 2283732 Y (UNIV NANCHAN) 10 June 1998 (10.06.1998) the preferred embodiment	1-189
A	CN 1090010 A (JIANG QINGMING) 27 July 1994 (27.07.1994) the whole document	1-189
A	EP 1085347 A2 (GEOFORSCHUNGSZENTRUM POTSDAM) 21 March 2001 (21.03.2001) the whole document	1-189

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 March 2013 (30.03.2013)	**16 May 2013 (16.05.2013)**
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer CHEN, Gang Telephone No. **(86-10) 62085154**

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT	International application No. PCT/CN2013/000171

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5333937 A (HOPKINS D J) 02 August 1994 (02.08.1994) the whole document	1-189
A	SU 685468A (KIEV GAZSTROIMASHIN) 15 September 1979 (15.09.1979) the whole document	1-189

Form PCT/ISA /210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2013/000171

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 87105404 A	17.02.1988	FR 2602542 A1	12.02.1988
		DE 3626986 A1	10.03.1988
CN 2283732 Y	10.06.1998	None	
CN 1090010 A	27.07.1994	None	
EP 1085347 A2	21.03.2001	DE 19944032 A1	15.03.2001
		JP 2001116849 A	27.04.2001
		AT 413613 T	15.11.2008
US 5333937 A	02.08.1994	CA 2108390 A	15.04.1994
SU 685468 A	15.09.1979	None	

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

E21C 27/12 (2006.01) i
E21C 27/14 (2006.01) i
E21B 1/14 (2006.01) i

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