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(54) **ROTATIONAL FORCE DRIVE COMPONENT, PROCESSING BOX AND IMAGE FORMATION DEVICE**

(57) A rotational force driving assembly (6), a process cartridge (1) including the rotational force driving assembly (6), and an image forming device are provided. The rotational force driving assembly (6) is disposed on an end of the process cartridge (1), and configured to receive a rotational force from outside and transmit a driving force to a rotating member that is disposed in the process cartridge (1) along a length direction of the process cartridge (1), where the rotational force driving assembly (6) includes a rotational force receiving component (61) and an adjusting mechanism (63); and the adjusting mechanism (63) is connected to the rotational force receiving component (61), and enables the rotational force receiving component (61) to shift in a longitudinal direction of the process cartridge (1) and enables an axis of the rotational force receiving component (61) to offset with respect to an axis of a photosensitive member (1003). The rotational force driving assembly (6) facilitates installation of the process cartridge (1). When the rotational force receiving component (61) fails to be coaxial with the rotating member due to a manufacturing tolerance, print quality of products is not affected.

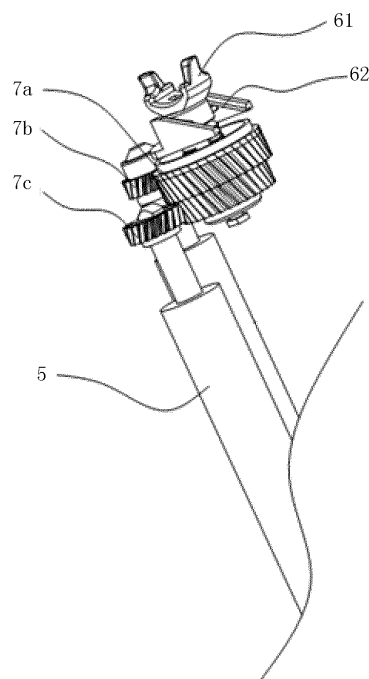


Fig. 6

Description**BACKGROUND****Technical Field**

[0001] The present invention relates to the field of electrophotographic technologies, and in particular, to a rotational force driving assembly, a process cartridge, and an image forming device.

Related Art

[0002] As one of image forming devices, an electrophotographic imaging device such as a laser printer, an LED printer, or a laser copier is popular with users by virtue of advantages in costs. A prior-art laser printer is generally provided with a detachable process cartridge. The process cartridge is provided with a rotating member. The rotating member includes at least one of a developing member, a photosensitive member, and a charging member. The rotating member is an essential part of the process cartridge, and after installed in the laser printer, the rotating member can be directly or indirectly driven by a rotational force exerted by a driving mechanism in the laser printer.

[0003] Fig. 1 and Fig. 2 show a process cartridge 100 that is detachably installed in an image forming device. A twisted protrusion 101 is disposed on an end of the process cartridge 100, and a rotational force driving head 102 having a recess is disposed in the image forming device. The rotational force driving head 102 having the recess in the image forming device is connected to a cam mechanism 103. An elastic member 104 is disposed between the cam mechanism 103 and the inner wall of the image forming device. The cam mechanism 103 is further connected to a lid 110 of the image forming device by using a connecting rod 105. In this way, when the lid 110 of the image forming device is lifted, the lid 110 drives the connecting rod 105 to pull the cam mechanism 103, the inner wall of the cam mechanism 103 extrudes the spring, so that the spring contracts axially (in the A direction), and then the cam mechanism 103 drives the rotational force driving head 102 to contract. When the process cartridge 100 is installed in the image forming device, the protrusion 101 does not interfere with the rotational force receiving component 102. After the process cartridge 100 is installed, the lid 100 of the image forming device releases the force exerted to the connecting rod 105, so that the cam mechanism 103 and the rotational force driving head 102 extend out under the action of the elastic member 104. In this way, the protrusion 101 of the process cartridge 100 can fit with the recess in the rotational force driving head 102, to receive a driving force from the image forming device.

[0004] However, the foregoing technical solution has some problems: The connecting rod, the cam mechanism, the elastic member, and the like need to be specially disposed in the image forming device, which is complex. Moreover, with use of the image forming device, the lid is prone to loose, which affects the process cartridge in a process of receiving a driving force. To resolve these disadvantages, the prior art provides another rotational force receiving component that rotates universally.

[0005] As shown in Fig. 3, a process cartridge 1 is provided. A rotational force receiving component 61 that can rotate is disposed on an end portion of the process cartridge 1, that is, an axis of the rotational force receiving component 61 and an axis of a photosensitive member 1003 that is driven by the rotational force receiving component 61 to rotate may incline with respect to each other. A process of installing the process cartridge is: As shown in Fig. 4(a), before the process cartridge enters an image forming device and in an installation process, the rotational force receiving component 61 inclines with respect to the photosensitive member 1003 under the action of gravity. After the installation is completed, as shown in Fig. 4(b), the rotational force receiving component 61 is coaxial with the photosensitive member 1003. After the process cartridge 1 is installed, the rotational force receiving component 61 can transmit force. Therefore, the connecting rod and the cam mechanism in the image forming device that fit with the rotational force driving head 102 may be omitted, to simplify the structure of the image forming device.

[0006] In a process of implementing the present invention, the inventor finds that, the rotational force receiving component that rotates universally has the following problem: The coaxial effect in Fig. 4(b) may not be achieved completely due to a manufacturing tolerance, thus print quality of products is affected.

SUMMARY

[0007] The present invention provides a rotational force driving assembly, a process cartridge, and an image forming device, to resolve a technical problem of a prior-art process cartridge that a coaxial effect cannot be achieved completely due to a manufacturing tolerance in a rotational force receiving component that rotates universally, thus print quality of products is affected.

[0008] Embodiments of the present invention provide a rotational force driving assembly, disposed on an end of a process cartridge, and configured to receive a driving force from outside and transmit the driving force to a rotating

member that is disposed in the process cartridge along a length direction of the process cartridge, where the rotational force driving assembly includes a rotational force receiving component and an adjusting mechanism; the rotational force receiving component is configured to receive the driving force; and the adjusting mechanism is connected to the rotational force receiving component, and enables the rotational force receiving component to shift in a longitudinal direction of the process cartridge and enables an axis of the rotational force receiving component to offset with respect to an axis of said photosensitive member.

[0009] In the rotational force driving assembly described above, the adjusting mechanism includes a side plate and an adjusting component, a bevel is disposed on a bottom surface of the side plate, correspondingly, the adjusting component is provided with a bevel opposite to the bevel on the side plate bottom surface, and after the rotational force driving assembly is assembled, the bevel on the side plate and the bevel on the adjusting component fit with each other and can slide with respect to each other.

[0010] In the rotational force driving assembly described above, the rotational force receiving component is disposed penetrating the side plate and the adjusting component, and the rotational force receiving component and the adjusting component both slide with respect to the side plate.

[0011] In the rotational force driving assembly described above, the rotational force driving assembly further includes a gear that is fixedly disposed on an end portion of the rotating member and a spring that is disposed in the gear.

[0012] The rotational force driving assembly described above further includes an intermediate connection portion that is connected between the rotational force receiving component and the rotating member and configured to transmit force.

[0013] In the rotational force driving assembly described above, the intermediate connection portion is a coupling, the coupling includes an upper end portion, a middle sliding block, and a cylinder, the upper end portion and the middle sliding block are connected through a key and key slot and can slide with respect to each other, and the cylinder and the middle sliding block are connected through a key and key slot and can slide with respect to each other.

[0014] In the rotational force driving assembly described above, the upper end portion and the cylinder are disposed on two opposite sides of the middle sliding block.

[0015] In the rotational force driving assembly described above, the spring abuts between the gear and the cylinder.

[0016] In the rotational force driving assembly described above, the adjusting component includes a circular sleeve that is sleeved on the bottom of the rotational force receiving component and bosses that are symmetrically disposed on the side wall of the circular sleeve.

[0017] In the rotational force driving assembly described above, the boss inclines with respect to an axis of the circular sleeve, and an inclined surface of the boss is the bevel on the adjusting component.

[0018] In the rotational force driving assembly described above, the adjusting mechanism and the rotational force receiving component are integrally formed.

[0019] In the rotational force driving assembly described above, the rotational force receiving component includes a "U" shape head portion.

[0020] In the rotational force driving assembly described above, at least a portion of the intermediate connection portion between the rotational force receiving component and the rotating member is provided as reelable, and the reelable portion is a flexible shaft.

[0021] In the rotational force driving assembly described above, the adjusting mechanism is a base, the base is disposed in the side plate and can slide with respect to the side plate, and the spring abuts between the base and the gear; and

the rotational force receiving component penetrates the side plate and the base and is connected to the side plate and the base in such a manner that the rotational force receiving component can rotate with respect to them, the flexible shaft has one end connected to the rotational force receiving component that penetrates the side plate, and the other end connected to the gear, and the spring is sleeved on the flexible shaft.

[0022] In the rotational force driving assembly described above, the base is a wedge base, a middle portion of the wedge base is provided with a through hole configured to fit with the rotational force receiving component, the wedge base has two inclined surfaces on two opposite sides, other two opposite sides of the wedge base are provided with protrusions, a middle portion of the side plate has a hollow portion configured to place the wedge base, the inner surface of opposite sides of the hollow portion is provided with two opposite plane surfaces and a pair of inclined surfaces that are opposite and configured to fit with the inclined surfaces of the wedge base, and the two opposite plane surfaces are separately provided with concave portions that fit with the protrusions on the wedge base.

[0023] In the rotational force driving assembly described above, the protrusions on the two opposite sides of the wedge base are arranged stagger so that opposite positions are not in a connection line, and the concave portions on the plate are correspondingly arranged stagger so that opposite positions are not in a connection line.

[0024] In the rotational force driving assembly described above, the shape of the concave portion is a structure like an inverted triangle with an upper end opening narrower than a lower end opening, the inverted triangle structure has inclined surfaces opposite on two sides, and a protrusion portion is disposed at a narrow portion for the concave portion.

[0025] In the rotational force driving assembly described above, an upper end portion of the protrusion portion on the

concave portion is provided with a vertex, the inclined surfaces are on two sides of the vertex, and the protrusion portion further includes two opposite plane surfaces.

[0026] In the rotational force driving assembly described above, in a natural state, the protrusions on the plane surface on the two sides of the wedge base are correspondingly above the vertex of the protrusion on the concave portion; and when the rotational force receiving component receives an external force, the protrusions on the opposite sides of the wedge base separately slide with respect to the inclined surfaces on the two concave portions.

[0027] In the rotational force driving assembly described above, a body portion of the rotational force receiving component is of a cylinder, an outer periphery of the body portion is provided with a boss, a diameter of the boss fits with the base through hole of the wedge base, an end portion of the body portion is provided with a slot, and the rotational force receiving component is connected to the slot and the base by using a latching buckle.

[0028] In the rotational force driving assembly described above, the flexible shaft is formed by winding a plurality of layers of steel wires, and winding directions of inner and outer layers of steel wires are the same.

[0029] In the rotational force driving assembly described above, the flexible shaft has one end connected to the rotational force receiving component by using a square hole or a square block, and the other end connected to a hub of the photosensitive member by using a square hole or a square block.

[0030] A process cartridge includes any rotational force driving assembly described above.

[0031] An image forming device includes a rotational force driving head that can provide a rotational force and the process cartridge, where the rotational force driving head engages with the rotational force driving assembly to transmit the force to a rotating member in the process cartridge.

[0032] By means of the foregoing technical solutions, the rotational force driving assembly further includes: a guide rail disposed on a housing and a driving force adjusting component located between the rotational force receiving component and the guide rail, where the guide rail is provided with a bevel that inclines with respect to an axis of a force transmission part, the rotational force receiving component can move with respect to the force transmission part, and the driving force adjusting component is connected to the rotational force receiving component, so that when the rotational force receiving component moves with respect to the force transmission part, movement also occurs in an axial direction of the rotating member. The rotational force receiving component can flexibly move in parallel with respect to the force transmission part under the limit of the guide rail, which can facilitate installation of the process cartridge, and resolve the technical problem of the prior-art process cartridge that a coaxial effect cannot be achieved completely due to a manufacturing tolerance in a rotational force receiving component that rotates universally, thus print quality of products is affected. Moreover, the driving assembly on the process cartridge can stably receive force from the rotational force driving head in the image forming device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0033]

Fig.1 is a schematic structural diagram of a rotational force receiving component in a process cartridge and a rotational force driving head in the image forming device of the prior art.

Fig. 2 is a schematic structural diagram of the engagement of said a rotational force receiving component of a process cartridge and a rotational force driving head of an image forming device in the prior art.

Fig. 3 is a schematic structural diagram of another process cartridge in the prior art.

Fig. 4(a) and Fig. 4(b) are schematic structural diagrams of a rotational force receiving component in a process cartridge and a rotational force driving head in the image forming device of said another process cartridge in the prior art.

Fig. 5 is a schematic structural diagram of a process cartridge in Embodiment One;

Fig. 6 is a schematic local diagram of the process cartridge in Embodiment One;

Fig. 7 is a schematic decomposition diagram of a rotational force driving assembly, a side plate and a rotating member of the process cartridge in Embodiment One;

Fig. 8 is a schematic structural diagram of the rotational force driving assembly of the process cartridge in a first state in Embodiment One;

Fig. 9 is a schematic exploded diagram of the rotational force driving assembly, the side plate and the rotating member of the process cartridge in Embodiment One;

Fig. 10 is a schematic structural diagram of a rotational force driving assembly of a process cartridge in a second state in Embodiment Two;

Fig. 11 is a schematic structural diagram of an adjusting mechanism in the rotational force driving assembly of the process cartridge in Embodiment Two;

Fig. 12 is a schematic structural diagram of a side plate of the process cartridge in Embodiment Two;

Fig. 13 is a schematic structural diagram of an image forming device in Embodiment Three.

Fig. 14 is a stereo diagram of the process cartridge;

Fig. 15 is a stereo diagram of a rotational force driving assembly in Embodiment Four;

Fig. 16 is an exploded diagram of the rotational force driving assembly in Embodiment Four;

Fig. 17 is a schematic assembling drawing of the rotational force driving assembly in Embodiment Four;

Fig. 18 is a stereo diagram of a rotational force receiving component in Embodiment Four;

Fig. 19 is a sectional diagram of the rotational force receiving component in Embodiment Four;

Fig. 20 is a stereo diagram of a flexible shaft in Embodiment Four;

Fig. 21 is a stereo diagram of a flexible shaft in Embodiment Four;

Fig. 22 is a sectional diagram of a portion of the flexible shaft in Embodiment Four;

Fig. 23 is a stereo diagram of a wedge base in Embodiment Four;

Fig. 24 is a stereo diagram of a side plate in Embodiment Four;

Fig. 25 is a diagram of the side plate diagramming from another bottom direction in Embodiment Four;

Fig. 26 is a sectional diagram along B-B shown in Fig. 24;

Fig. 27 is a sectional diagram along A-A shown in Fig. 17;

Fig. 28a to Fig. 28d are diagrams showing a change of relative position between a rotational force driving assembly and a rotational force driving head in an image forming device when the process cartridge is installed into the image forming device in Embodiment Four;

Fig. 29a to Fig. 29d are diagrams showing a change of relative position between the rotational force driving assembly and the rotational force driving head in the image forming device when the process cartridge is removed from the image forming device;

Fig. 30 is a schematic diagram showing the relative movement between the wedge base and the side plate during the engaging process of the rotational force driving assembly and the rotational force driving head in the image forming device;

Fig. 31 is a schematic diagram showing the relative movement between the wedge base and the side plate during the engaging process of the rotational force driving assembly and the rotational force driving head in the image forming device;

Fig. 32 is a schematic diagram showing the relative movement between the wedge base and the side plate during

the engaging process of the rotational force driving assembly and the rotational force driving head in the image forming device;

Fig. 33 is a schematic diagram showing the relative movement between the wedge base and the side plate during the engaging process of the rotational force driving assembly and the rotational force driving head in the image forming device;

Fig. 34 is a schematic diagram showing the relative movement between the wedge base and the side plate during the engaging process of the rotational force driving assembly and the rotational force driving head in the image forming device;

Fig. 35 is a schematic diagram showing the relative movement between the wedge base and the side plate during the disengaging process of the rotational force driving assembly and the rotational force driving head in the image forming device.

Drawing reference signs:

1a, 1b, 1c, 1d process cartridge;	14a, 14bbevels on the guide rail;	12-developing unit;
11-cleaning unit;	1311-claw;	1312-blind hole;
1313-cylindrical boss;	1314-latching slot;	133-wedge base;
1333a, 1333b, 1321b-inclined surface;	1331-base through hole;	134-latching buckle;
1332a, 1332b-base protrusions;	135-flexible shaft;	1352-first end portion;
1334-upper top surface;	1351-body portion;	1353-second end portion;
137-photosensitive member hub; 1371 hollow portion;	136-spring; 1372-hub boss;	1373-hub gear; 1374-square hole;
21-rotational force driving head;	2-housing;	211-transmitting pin;
4-side plate;	41, 42-bevel;	4a, 4bsecond bevel;
422a, 422b-side plate concave portion;	421 hollow portion;	423a, 423bprotrusion;
421 a, 421 b, 433b-side plate bevel;	5-developing member;	613-concave hole;
421c, 421d-side plate plane;	6-rotational force driving assembly;	611, 612-claw;
422a1, 422a2, 422b1, 422b2-concave bevels;	61-rotational force receiving component;	62-limiting component;
423a1, 423b1-protrusion vertexes;	621-circular curved section;	631-circular sleeve;
423b2, 423b3-vertex inclined surface;	63-adjusting mechanism;	163a-second circular sleeve;
423b4, 423b5-vertex plane;	632, 633-inclined surface;	64-upper end portion;
624, 623-inner bevel;	163b, 163c-second boss;	66-cylinder;
622, 625-inner circle plane;	65-middle sliding block;	67-tapered spring;
62a, 62b-limiting plane;	7a1-stepped surface;	68-latching buckle ;
7b-toner feeding member;	1006-rod;	7a-gear;
7c-developing member gear;	1003-photosensitive member;	7a2-the gear through hole;
1000-image forming device;	1001a-head portion;	1004-transfer belt;
1001b, 1001 c-transmitting pin;	1005-fixation device;	110-lid
101-twisted protrusion;	102-rotational force driving head;	103-cam mechanism;
104-elastic member;	105-connecting rod	

DETAILED DESCRIPTION

[0034] To make it easier and clearer for persons skilled in the art to understand the technical solutions involved in the present invention, the following provides a description by using specific implementation manners.

[0035] The technical solutions provided in the present invention include a process cartridge. A rotational force driving assembly is disposed on the process cartridge. The rotational force driving assembly has a rotational force receiving component that engages with a rotational force driving head in an image forming device. The rotational force receiving component may transmit a received driving force to a rotating member in the process cartridge, for example, a gear, a

developing member, or a photosensitive member. In a process of installing the process cartridge, the rotational force receiving component can shift from an initial position, an axis of the rotational force receiving component keeps parallel to the initial position during movement, and the rotational force receiving component axially moves into a housing of the process cartridge. In this way, after the process cartridge is installed in the image forming device, the rotational force receiving component can flexibly engage with the rotational force driving head in the image forming device.

[0036] The process cartridge may include a photosensitive member, or may not include a photosensitive member. The process cartridge that does not include a photosensitive member is also referred to as a developer cartridge. The following provides a plurality of different embodiments. By using an adjusting mechanism, the rotational force receiving component can implement the foregoing technical solutions during installation.

Embodiment One

[0037] As shown from Fig. 5 to Fig. 7, a process cartridge 1 provided by Embodiment One includes a housing 2, the housing includes a frame body and side plates 4 provided at two sides of the frame body, where the frame body is provided with a developing agent accommodating cavity and a developing member 5 in its interior; a rotational force driving assembly 6 and a gear assembly are provided at the end portion of the process cartridge 1, the gear assembly includes a gear 7a connected with the rotational force driving assembly 6, a developing member gear 7c and a toner feeding member gear 7b which are connected with the gear 7a, in which the gear 7a is preferably adopted as a rotating member which receives the rotational torque of the rotational force driving assembly 6; the rotational force driving assembly 6 includes: a rotational force receiving component 61 configured to receive an external force; a force transmission part which transmits the driving force received by the rotational force receiving component 61 to the rotating member in the process cartridge, and the rotational force receiving component 61 can move with respect to the force transmission part. Preferably, the force transmission part is a cylinder 66, a through hole (not shown) is provided on the cylinder 66, and a pin is inserted in the through hole of the cylinder, the force is transmitted to the gear 7a through the pin (similar to the prior art showed in Fig. 4), or a protrusion (not shown) is extended from the inner wall of the gear 7a, thus the force is transmitted to the gear 7a by the cylinder 66 in an abutting manner between the cylinder 66 and the inner wall of the gear 7a; a guide rail, provided on the side plate 4, the guide rail includes bevels 41 and 42 which incline from the axis of the force transmission part; and an adjusting mechanism 63, located between the rotational force receiving component 61 and the guide rail, the adjusting mechanism 63 is configured so that when the rotational force receiving component 61 moves with respect to the force transmission part, the adjusting mechanism 63 shifts in both the axis direction of the rotating member and the direction perpendicular thereto.

[0038] The manner that the rotational force receiving component 61 moves with respect to the force transmission part is specifically shown from Fig. 7 to Fig. 9, the rotational force receiving component 61 can be in a first state that it is coaxial with the cylinder 66 and in a second state that it is not coaxial with the cylinder 66. Fig. 8 shows the first state of the rotational force receiving component 61 which is coaxial with the cylinder 66, the distance between the top end of the rotational force receiving component and the upper surface of the gear 7a is L1. Fig. 9 shows the second state of the rotational force receiving component 61 which is not coaxial with the cylinder. During the process of the driving force adjusting mechanism 63 moving along the guide rail, with respect to the first state, the rotational force receiving component 61 retracts a distance of L1-L2 (which is the difference value of the L1 and L2) towards the housing of the process cartridge in the axial direction of the rotational force receiving component 61, and deviates a distance of L3 towards the direction away from the gear 7a in the direction perpendicular to the axial direction of the rotational force receiving component 61, and the axis of the rotational force receiving component 61 is always parallel with the axis of the gear 7a.

[0039] As shown in Fig. 7 and Fig. 8, preferably, the rotational force driving assembly 6 includes the rotational force receiving component 61, the adjusting mechanism 63, a limiting component 62, a coupling, where the coupling includes an upper end portion 64, a middle sliding block 65 and a cylinder 66. The rotational force receiving component 61 includes two claws 611 and 612 which fit with the transmitting pins 1001b and 1001c on the rotational force driving head 102 in the image forming device; the whole rotational force receiving component 61 is substantially a flat U shape, thus the U shape bottom can better abutting the head portion 1001a of the rotational force driving head 102, and the flat shape facilitates better engagement between the rotational force receiving component 61 and the rotational force driving head 102 when the process cartridge is installed. A protrusion is provided on the upper end portion 64 of the coupling, which can be inserted into the concave hole 613 on the rotational force receiving component 61, obviously, the upper end portion 64 can also be integrated with the rotational force receiving component 61 as a whole. A first groove which fits with the upper end portion 64 is provided on the upper surface of the middle sliding block 65, a second groove perpendicular to the first groove is provided on the lower surface, and the second groove fits with the cylinder 66; in this way, under the action of the coupling, the rotational force receiving component can move about the axis of the gear 7a in a plane. The driving force adjusting mechanism 63 includes a circular sleeve 631 which is sleeved on the cylinder portion of the upper end portion 64, two inclined bosses are extended from a side of the circular sleeve 631, and the two inclined

bosses respectively includes an inclined surfaces 632 and 633. A reset part is provided between the cylinder 66 and the inner wall of the gear 7a, the reset part can keep the rotational force receiving component 61 and the coupling in the first state, the reset part can be any member including spring, tension spring or magnet etc, which in the present embodiment is preferably a tapered spring 67, and one end of the tapered spring 67 abuts the inner side of the cylinder 66, the other end abuts a stepped surface 7a1 in the gear 7a. The limiting component 62 includes an inner circle, the inner circle is provided with a circular curved section 621; the two ends of the circular curved section 621 respectively include inner circle planes 622 and 625, and inner bevels 624 and 623 extend inward respectively from the two inner circle planes 622 and 625. After completing assembling the rotational force driving assembly, the inclined surface 632 of the boss is located between the bevel 41 and the inner circular bevel 624, the inclined surface 633 of the boss is located between the bevel 42 and the inner circular bevel 623, and the circular sleeve 631 is sleeved on the outer portion of the upper end portion 64. Before installing the process cartridge 1 in the image forming device, the rotational force receiving component 61 is in the first state shown in Fig. 8; in the process of installing the process cartridge, the rotational force receiving component will abuts the rotational force driving head 102, then the rotational force receiving component 61 will be subjected to an external force and move along the opposite direction of the installation direction; during moving of the rotational force receiving component 61, the adjusting mechanism 63 will also receive a same external force, and will move along the guide rail under the action of the external force; to be specific, the inclined surface 632 and 633 of the boss move respectively along the bevels 41 and 42, then the force and the direction of which is opposite to the installation direction, received by the adjusting mechanism 63 is divided into two forces respectively along the axial direction of the rotating member and along the direction perpendicular to the axial direction of the rotating member, and under the action of the driving mechanism 63 the rotational force receiving component 61 will be in the second state; the limiting component 62 can facilitate the movement of the adjusting mechanism along the preset guide rail; after the installation of the process cartridge is accomplished, the rotational force driving head 102 is substantially coaxial with the rotational force receiving component 61 in the axial direction, so that the rotational force receiving component 61 will be in the first state under the action of the reset part, and can receive a rotational force from the rotational force driving head 102. When removing the process cartridge 1 from the image forming device, the rotational force receiving component 61 will turn into the second state from the first state in which the force is transmitted, the rotational force receiving component 61 retracts toward the frame side of the process cartridge in the axial direction of the rotating member, the interference with the rotational force receiving component 61 will not occur, in this way, the process cartridge can be successfully removed; after the process cartridge is completely removed, the rotational force receiving component 61 will turn into the first state under the action of the reset part.

[0040] As shown in Fig. 7, preferably, the process cartridge 1 further includes a latching buckle 68 configured to prevent the cylinder 66 from detaching, the cylinder 66 can be inserted into the through hole 7a2 of the gear 7a, and the outer size of the cylinder 66 is less than the size of the gear through hole 7a2, the inner size of the latching buckle 68 is less than the outer size of the cylinder 66 and is larger than the size of the through hole 7a2; in this way, the cylinder 66 can be inserted into the gear through hole 7a2 first, then the latching buckle 68 is latched on the cylinder 66, thus the cylinder 66 will not detach from the gear 7a by using the latching buckle 68.

[0041] It should be noted that, the function of the coupling is to better fit with the rotational force receiving component 61 in the second state, so that the axis of the rotational force receiving component 61 is always parallel to the axis of the rotating member; and the upper end portion 64 can be integrated with the rotational force receiving component 61 as a whole.

Embodiment Two

[0042] A process cartridge provided by Embodiment Two also includes a housing, the housing also includes a frame body and side plates located on two sides of the frame body, a developing agent accommodating cavity and a developing member; a rotational force driving assembly and a gear assembly, the gear assembly includes a gear connected with the rotational force driving assembly, a developing member gear and a toner feeding member gear which are connected with the gear, in which the gear is preferably adopted as a rotating member which receives the rotational torque of the rotational force driving assembly; and the adjusting mechanism is configured so that when the rotational force receiving component 61 in the rotational force driving assembly moves with respect to the force transmission part, the adjusting mechanism shifts in both the axis direction of the rotating member and the direction perpendicular thereto. The process cartridge further includes a tapered spring 67, one end of the tapered spring 67 abuts the inner side of the cylinder 66, the other end abuts the stepped surface 7a1 in the gear 7a; and a latching buckle 68 configured to prevent the cylinder 66 from detaching from the cylinder 66. However, the difference lies in that:

As shown from Fig. 10 to Fig. 12, the adjusting mechanism 63 moves perpendicular to the axis of the gear 7a, at least a portion of the rotational force driving assembly 6 abuts the bevels 4a and 4b on the guide rail. Specifically, as shown in Fig. 10, the adjusting mechanism 63 includes a second circular sleeve 63a which is sleeved on the

bottom of the rotational force receiving component 61 (after the driving assembly is assembled, the bottom of the rotational force receiving component 61 is the upper end portion 64), and second bosses 63b and 63c which are symmetrically provided on the side wall of the circular sleeve. As shown in Fig. 10 and Fig. 11, the rotational force driving assembly is further provided with a limiting component 62, the limiting component 62 includes limiting planes 62a and 62b which fit with the bosses, and the planes (i.e. the upper surface of the boss) of the second bosses 63b and 63c on the adjusting mechanism can slide with respect to the limiting planes 62a and 62b of the limiting component. As shown in Fig. 12, the guide rail includes second bevels 4a and 4b which are provided on the side plate 4.

[0043] After the rotational force driving assembly of the process cartridge is assembled, a cylinder 66 which is similar to Embodiment One is arranged coaxial to the gear 7a, under the action of the reset part, the rotational force receiving component 61 is arranged coaxial to the gear 7a; during installing process or removing process of the process cartridge, the rotational force receiving component 61 receives an external force from the rotational force driving head 102 in the image forming device, meanwhile the adjusting mechanism 63 moves along a direction preset by the limiting component 62, through the adjusting mechanism 63, the upper end portion 64 of the coupling at the bottom of the rotational force receiving component 61 moves together with the rotational force receiving component 61; and the upper end portion 64 or the middle sliding block 65 abuts the second bevels 4a and b on the side plate 4, in this way, the rotational force receiving component 61 is in the second state which is similar in Embodiment One.

Embodiment Three

[0044] As shown in Fig. 13, preferably, Embodiment Three provides an image forming device 1000, including a frame body accommodating a process cartridge (a process cartridge accommodating portion). The frame body includes an intermediate shaft, and the whole frame body can rotate around an axis of the intermediate shaft. Two disks are fixedly disposed on two sides of the intermediate shaft, the disks are provided with gears, the gears fit with gears on two sides of a rod 1006, and the gears on the two sides of the rod 1006 can drive the whole frame body to rotate. The rod 1006 is made of a metal material, which can improve the hardness of the frame body. In addition, separating plates are disposed on the disks to divide the frame body into four small frame bodies, so that four process cartridges 1 a, 1 b, 1 c, and 1 d can be installed in the frame body, that is, process cartridges (developer cartridges) of four colors, such as black (BK), blue (C), red (M), and yellow (Y), can be installed, and the image forming device 1000 can perform color printing.

[0045] The image forming device 1000 further includes: a photosensitive member (also referred to as a photosensitive drum) 1003 disposed on the lower right of the frame body; a transfer belt 1004 located below the photosensitive member 1003 and the frame body, where the transfer belt 1004 transfers, to a print medium such as a paper through cooperation with a fixation device 1005, an image that needs to be developed; a motor; a rotational force driving head receiving motor power; and a process cartridge disposed in the frame body, where the process cartridge may be the process cartridge provided in Embodiment One or Embodiment Two. After the process cartridge is installed in the image forming device 1000, the rotational force driving head can exert a rotational driving force to a rotational force receiving component of the process cartridge.

[0046] It should be noted that, the image forming device may form an image in one color, and the process cartridge may be disposed as a one-piece cartridge having a photosensitive member.

Embodiment Four

[0047] To make it easier and clearer for persons skilled in the art to understand the technical solutions involved in the present invention, the following provides a description by using specific implementation manners of Fig. 14 to Fig. 26.

[0048] In Fig. 14, the process cartridge 1 includes a developing unit 12 and a cleaning unit 11; in addition, developing agent, a charging member, a developing member and a photosensitive member are also provided in the process cartridge 1. After the process cartridge 1 is installed into the image forming device (not shown in the figure), the rotating part in the process cartridge is driven by the image forming device to rotate, for example, through the engagement between the rotational force driving head 21 in the image forming device and the rotational force driving assembly 6 in the process cartridge, after starting the image forming device, the rotational force driving head 21 transmits a rotational force to the rotational force driving assembly 6, so as to drive the rotating member in the process cartridge to rotate, for example, the photosensitive member which is one of the rotating members is driven to rotate, then photosensitive member or the component provided on the photosensitive member drives other rotating members (such as the charging member, the developing member etc) in the process cartridge, and finally the objective of printing the developing agent in the process cartridge 1 onto the medium is achieved.

[0049] As shown in Fig. 14, coordinate direction Y is the longitudinal direction of the process cartridge 1, a rail (not

shown) for guiding the installation of the process cartridge 1 is provided in the image forming device, specifically, the rail will guide the process cartridge 1 to be installed along a direction perpendicular to the longitudinal direction of the process cartridge, that is, to be installed along the coordinate direction X. The rotational force driving assembly 6 is arranged at one end of the process cartridge 1 along the longitudinal direction of the process cartridge 1, at least a portion of the rotational force driving assembly 6 is exposed at the end portion of the process cartridge 1 in the longitudinal direction; the rotational force driving head 21 is arranged in the image forming device in a direction perpendicular to the installation direction of the process cartridge 1, and is opposite to the end portion of the process cartridge 1 at which the rotational force driving assembly 6 is provided. After the process cartridge 1 is installed in the image forming device, the rotational force driving assembly 6 engages with the rotational force driving head 21 to transmit force. The rotational force driving assembly 6 includes an engaging portion, an adjusting mechanism and an intermediate connection portion; the engaging portion is configured to receive an external driving force; the adjusting mechanism makes the engaging portion shift with respect to the longitudinal direction of the process cartridge, and makes the axis of the engaging portion deviate substantially in parallel with respect to the axis of the photosensitive member; the intermediate connection portion transmits torque between the engaging portion and the photosensitive member hub.

[0050] Fig. 15 is a stereo diagram of the rotational force driving assembly 6, Fig. 16 is an exploded diagram of the rotational force driving assembly 6. As shown in Fig. 16, the rotational force driving assembly 6 includes the rotational force receiving component 61, the side plate 4, a wedge base 133, a latching buckle 134, a flexible shaft 135, a spring 136 and a photosensitive member hub 137. In the present embodiment, the rotational force driving assembly 6 is arranged at one end portion of the photosensitive member 1003, the photosensitive member hub 137 is coaxial to the photosensitive member 1003 and is fixedly connected thereto; under the condition that no external force exists, the axis of the rotational force receiving component 61 is coaxial to the axis of the photosensitive member hub 137. The engaging portion is the rotational force receiving component 61, the adjusting mechanism includes the side plate 4, the wedge base 133 and the spring 136, at least a portion of the intermediate connection portion is provided as reelable, and the reelable portion is the flexible shaft 135.

[0051] Fig. 17 is a schematic assembling drawing of the rotational force driving assembly 6. As shown in Fig. 17, the outer periphery of the photosensitive member hub 137 is provided with a hub gear 1373, a hollow portion 1371 is in its interior, the bottom thereof includes a hub boss 1372, the hub boss 1372 is provided with a square hole 1374; and end portion of the rotational force receiving component 61 includes a plurality of claws 1311, in the present embodiment preferably two claws, which are configured to engage with the rotational force driving head in the image forming device to transmit force; as shown in Fig. 18, the body portion of the rotational force receiving component 61 is of cylinder its outer periphery is provided with a cylindrical boss 1313, so that the diameter D2 of the outer periphery of a portion of the cylinder of the rotational force receiving component 61 is less than the diameter D1 of the outer periphery of another portion of the cylinder (as shown in Fig. 19), the cylinder portion with diameter D1 is closer to the end portion at which the claw 1311 of the rotational force receiving component 61 is located, the other end portion of the body is provided with a latching slot 1314, configured to install the latching buckle 134; in addition, Fig. 19 is a cross sectional diagram of the rotational force receiving component 61, a blind hole 1312 is provided in the interior of the rotational force receiving component 61, and the cross section of the blind hole 1312 is a square.

[0052] The flexible shaft 135 shown in Fig. 20 includes a main body portion 1351, a first end portion 1352 and a second end portion 1353; the main body portion 1351 is cylindrical, the first end portion 1352 and the second end portion 1353 are cut as square shape to fit with the square hole 1374 at the end portion of the photosensitive member hub 137 and fit with the square blind hole 1312 in the rotational force receiving component 61. The square hole 1374 can be arranged at two ends of the flexible shaft 135, accordingly, the end portion of the rotational force receiving component 61 can be made as square cylinder which can fit with the square hole 1374, a square cylinder may fit with the square hole 1374 is accordingly provided in the photosensitive member hub 137.

[0053] Specifically, the structure of the flexible shaft is formed by winding a plurality of layers of steel wires, the area J shown in Fig. 21 shows the interior structure of the flexible shaft 135, which is another layer of winded steel wire, and is wrapped inside the outer layer; the area K shown in the partial sectional diagram of Fig. 22 shows that the flexible shaft 135 is formed by winding a plurality of layers of steel wires; specifically, the winding direction of each layer of steel wire is the same, that is, all right-handed rotation or all left-handed rotation; the plurality layers of steel wire can be two layers, three layers or more, which can be arranged according to design requirements, the rigidity of the flexible shaft as well as its capability of transmitting torque can be changed by changing the diameter of the steel wire or the number of winding layers of the flexible shaft.

[0054] Fig. 17 shows the wedge base 133, Fig. 23 is a stereo diagram of the wedge base 133 (the same with the sliding piece 230 in Embodiment Six). A base through hole 1331 is provided at the middle portion of the wedge base 133, the base through hole 1331 is configured to fit with the cylindrical body portion of the rotational force receiving component 61, the diameter D3 of the base through hole 1331 is less than the diameter D1 of the outer periphery of the rotational force receiving component 61, and fits with the cylinder of the D2 portion shown in Fig. 19; after the rotational force receiving component 61 is installed into the base through hole 1331 of the wedge base 133, the latching buckle

134 shown in Fig. 17 is latched into the latching slot 1314 of the rotational force receiving component 61, the upper top surface 1334 of the wedge base abuts the surface of the cylindrical boss 1313 of the rotational force receiving component 61, so that the rotational force receiving component 61 is relatively fixed and connected to the wedge base 133, and the rotational force receiving component 61 can rotate with respect to the wedge base 133; the wedge base 133 includes two base inclined surface 1333a and 1333b located at opposite sides, base protrusions 1332a and 1332b are provided at the other two opposite sides of the wedge base 133.

[0055] Fig. 17 shows the side plate 4, Fig. 24 is a stereo diagram of the side plate 4. The middle portion of the side plate 4 includes a hollow portion 421, configured to place the wedge base 133. The inner surface of opposite sides of the side plate hollow portion 421 is provided with two side plate concave portion 422a and 422b, configured to place the base protrusion 1332a and 1332b provided on the wedge base 133.

[0056] Fig. 25 is a diagram of the side plate 4 diagramming from the bottom surface, as shown in the figure, the inner surface of the side plate hollow portion 421 includes a pair of side plate bevels 421 a and 421 b located at opposite sides, the two side plate bevels fit with base inclined surfaces 1333a and 1333b of the wedge base; the inner surface of the side plate hollow portion 421 further includes two opposite side plate planes 421 c and 421 d; side plate concave portions 422a and 422b shown in Fig. 24 are respectively arranged on the side plate planes 421c and 421 d, which is shown by the dotted circle in Fig. 25; the side plate concave portions 422a and 422b are of the same structure, and are arranged on opposite positions of the lateral planes 421 c and 421 d, however, the opposite positions are not in a connection line, but are arranged stagger; the shape of the side plate concave portion is a structure like an inverted triangle with upper end opening narrower than the lower end opening, as shown in the sectional diagram of Fig. 26; the side plate concave portion 422a includes concave bevels 422a1 and 422a2 which are in mirror symmetry, a protrusion 423a which protrudes towards the interior of the side plate hollow portion 421 is provided on the central axis of these two mirror symmetrical concave bevels; since the structures of the side plate concave portions 422b and 422a are the same, the side plate concave portion 422b includes symmetrical concave bevels 4221 and 422b2, and is further provided with a protrusion 423b.

[0057] Fig. 26 shows the sectional diagram B-B of the side plate 4, the shape of the side plate concave portion 422b and its position on the side plate are shown as the dotted circle, L is the center axis of said side plate 4, the top of the protrusion 423b is a tip portion, which includes a protrusion vertex 423b1, vertex inclined surface 423b2 and 423b3 located at two sides of the protrusion vertex 423b1, and vertex planes 423b4 and 423b5 located at two sides of the protrusion vertex.

[0058] Through the understanding of the structures of each part of the rotational force driving assembly 6, the assembling relationship of the rotational force driving assembly 6 can be understood. To be specific, Fig. 17 is a schematic assembling drawing of the rotational force driving assembly 6. First the wedge base 133 is installed into the side plate hollow portion 421 of the side plate 4 according to matching relationship of its shape, the matching relationship after the wedge base 133 is installed into the side plate hollow portion 421 of the side plate 4 is as shown in A-A sectional diagram of Fig. 27, the base protrusions 1332a and 1332b are respectively located in the side plate concave portions 422b and 422a of the side plate 4; then the rotational force receiving component 61 is installed into the base through hole 1331 of the wedge base 133, the latching buckle 134 is latched into the latching slot 1314, so that the rotational force receiving component 61 is relatively fixed with the wedge base 133; then one end of the flexible shaft 135 is inserted into the square hole 1374 of the hub 137, the spring 136 is sleeved on the flexible shaft 135, and then the assembled wedge base 133, the rotational force receiving component 61 and the side plate 4 are installed as a whole on the photosensitive member hub 137, the blind hole 1312 of the rotational force receiving component should be aligned with the other end of the flexible shaft 135 to be installed, then the side plate is fixed on the process cartridge via a screw, so as to fix the rotational force driving assembly 6 on the process cartridge 1. Through the fit of the end portion of the flexible shaft 135, the photosensitive member hub 137 and the base through hole 1331 of the wedge base 133, the objective of force transmission can be achieved. After assembling, the photosensitive member hub 137 is coaxial with the photosensitive member 1003 and is relatively fixed thereto, the flexible shaft 135 and the spring 136 are arranged between the photosensitive member hub 137 and the rotational force receiving component 61, one end of the spring 136 abuts the hub boss 1372 of the photosensitive member hub 137, the other end abuts the bottom surface of the wedge base 133; after assembling, the spring 136 has a certain amount of compression, so that the wedge base 133 contacts the hollow portion of the side plate 4, and the wedge base 133 can slide with respect to the side plate 4, during the relative movement, the rotational force receiving component 61 is driven to shift along the direction of its axis F2, and the axis F2 is substantially parallel offset with respect to the axis F1 of the photosensitive member hub (the axis of the photosensitive member hub is coaxial with the axis of the photosensitive member); before the relative sliding between the wedge base 133 and the side plate 4, the base protrusions 1332a and 1332b on the wedge base are respectively located above the protrusion vertexes 4231 and 423a1 of the protrusions 423b and 423a on the side plate 4; when the wedge base 133 and the side plate 4 slide relatively, meanwhile, the base protrusions 1332a and 1332b on the wedge base can slide with respect to the concave bevels 4221 and 422a2 at the same time, or slide with respect to the concave bevels 422b2 and 422a1.

[0059] An image forming device comprises a printer and said process cartridge. Following will describe in detail that

how to install a process cartridge in to a printer. Fig. 28a to Fig. 28d are schematic diagrams which show the process that the process cartridge is installed into the printer, and the rotational force receiving component 61 located on the end portion of the process cartridge 1 engages with the rotational force driving head 21 in the printer. In the figures, the direction shown by the arrow is the installation direction of the process cartridge 1 (the installation direction is perpendicular to the longitudinal direction of the process cartridge). When installing the process cartridge 1 into the printer along the direction shown by the arrow, the end portion of the rotational force receiving component 61 contacts the end portion of the rotational force driving head 21 in the printer, at this time, they are in the interference stage, as shown in Fig. 28; as the further installation of the process cartridge 1, the rotational force receiving component 61 makes the wedge base 133 slide with respect to the side plate 4 through the interaction force between the rotational force receiving component 61 and the rotational force driving head 21, at this time, the rotational force receiving component 61 deviates towards the direction opposite to the installation direction of the process cartridge 1, that is, the base inclined surface 1333a of the wedge base 133 relatively slides with respect to the side plate bevel 421 a which engages with it; at this time, the base protrusion 1332a on the wedge base slides along the side plate bevel 422b2 of the side plate 4, the base inclined surface 1333a slides along the side plate bevel 421 a; the axis F2 of the rotational force receiving component 61 is parallel offset with respect to the axis F1 of the photosensitive member hub 137, and the rotational force receiving component 61 retracts in its axis F1 and along the direction opposite to the extending direction of the rotational force receiving component from the process cartridge, which gradually deforms the flexible shaft 135 to a certain extent, as shown in Fig. 28b and Fig. 28c; until the end portion of the rotational force receiving component 61 avoids the rotational force driving head 21, as shown in Fig. 28c, the rotational force receiving component 61 extends due to the springback effect of the spring 136 and engages with the transmitting pin 211 on the end portion of the rotational force driving head 21 through the claw 1311 on its end portion, at this time, the flexible shaft returns to the initial state, as shown in Fig. 28d, so that the process cartridge is installed in place. Starting the printer, the force can be transmitted to the rotational force receiving component 61 through the rotational force driving head 21, then the rotational force can be transmitted to the photosensitive member hub 137 through the flexible shaft, and then the force is transmitted to the rotating members in the process cartridge.

[0060] Fig. 29a to Fig. 29d are schematic diagrams which show the process that the process cartridge is uninstalled from the printer, and the rotational force receiving component 61 arranged on the end portion of the process cartridge disengages with the rotational force driving head 21 in the printer. Fig. 29a shows the state that the rotational force receiving component 61 still engages with the rotational force driving head 21; when uninstalling the process cartridge along the direction shown by the arrow, the rotational force receiving component 61 makes the wedge base 133 to slide with respect to the side plate 4 through the interaction between the rotational force receiving component 61 and the rotational force driving head 21; at this time, the inclined surface 1333b of the wedge base 133 in Fig. 29a slides with respect to the side plate bevel 421 b in the side plate 4 which contacts with it, as shown in Fig. 29b; meanwhile the protrusion 1332a on the wedge base slides along the concave bevel 4221 in the side plate 4, the protrusion 1332b slides along the concave bevel 422a2; under the interaction between the rotational force receiving component 61 and the rotational force driving head 21, the rotational force receiving component 61 retracts gradually, and its axis F2 parallel offsets with respect to the axis F1 of the photosensitive member hub 137, as the uninstalling of the process cartridge 1 from the printer, the flexible shaft 135 is bended and deformed, as shown in Fig. 29b and Fig. 29c, until the rotational force receiving component 61 completely disengages from the rotational force driving head, as shown in Fig. 29c; the rotational force receiving component 61 returns to the initial state under the action of the spring 136, the flexible shaft also returns to the initial state, as shown in Fig. 29d; at last, the process cartridge 1 is uninstalled from the printer.

[0061] Fig. 30 to Fig. 33 are schematic diagrams which show the relative movement between the wedge base and the side plate during the process of engagement between the rotational force driving assembly and the rotational force driving head of the printer. In order to illustrate the relative movement, the wedge base 133 is denoted with dotted line, the other parts are shown in sectional diagram. As shown in Fig. 30, the dotted line shows the wedge base 133, the side plate 4 is arranged at the end portion of the photosensitive member hub 137, the wedge base is arranged at the middle portion of the side plate 4; a protrusion 423a is provided on the side plate 4, a base protrusion 1332a is provided on the lateral side of the wedge base 133, the base protrusion 1332a relatively slides in the side plate concave portion 422b provided on the side plate 4; when the rotational force driving assembly is not under the action of external force, the base protrusion 1332a on the wedge base 133 is above the protrusion 423b on the side plate 4.

[0062] When installing the process cartridge into the printer, the rotational force receiving component 61 on the rotational force driving assembly abuts the rotational force driving head 21 in the printer, the action generated between the two parts is applied to the rotational force receiving component 61, the rotational force receiving component 61 further acts on the wedge base 133, the wedge base 133 then slides with respect to the side plate 4 as shown in Fig. 31; that is, the base inclined surface 1333a of the wedge base 133 fits with the side plate bevel 421 a and relatively slides, and the base protrusion 1332a on the wedge base 133 slides with respect to the bevel 423b3 on the protrusion portion of the side plate 4; thus, the wedge base 133 can drive the rotational force receiving component 61 to parallel offset with respect to the axis of the photosensitive member hub 137; and the bevel 421 a is parallel to the bevel 423b3, which can

limit the swinging of the wedge base 133 along the direction perpendicular to the axial direction of the photosensitive member hub 137.

[0063] When the wedge base 133 relatively slides with respect to the side plate 4 to a certain extent, the lower end portion of the inclined surface 1333a of the wedge base 133 contacts the inner surface 1375 of the photosensitive member hub 137, as shown in Fig. 32.

[0064] As shown in Fig. 33, after the inclined surface 1333a of the wedge base 133 contacts the inner surface of the photosensitive member hub 137 is blocked, the relative offset of the wedge base 133 with respect to the axis of the photosensitive member hub 137, the rotational force receiving component 61 is further subjected to a force, and acts on the wedge base 133, the base inclined surface 1333a of the wedge base 133 abuts on the inner surface 1375 of the photosensitive member hub, and the base protrusion 1332a of the wedge base contacts the lateral plane 423b4 on the protrusion 423b of the side plate; thus, the wedge base 133 can shift in the direction parallel to the axis of the photosensitive member hub through the two parallel planes 1375 and 423b4 limiting the sliding of the wedge base 133.

[0065] Fig. 34 is a sectional diagram in the direction opposite to the sectional diagrams shown from Fig. 30 to Fig. 33, the dotted line shows the wedge base 133. As shown in Fig. 34, the other plane of the wedge base 133 which is opposite to the plane where the protrusion 1332a is located is provided with a protrusion 1332b which is of the same structure with the protrusion 1332a but is not symmetrically arranged with the protrusion 1332a; similarly, the hollow portion of the side plate 4 is further provided with a concave portion 422a on the plane opposite to the plane where the concave portion 422b is located, the concave portion 422a is of the same structure with the concave portion 422b; at the moment when the protrusion 1332a relatively slides in the concave portion 422a, the protrusion 1332b relatively slides in the concave portion 422a. The movement is the same with the movement shown from Fig. 30 to Fig. 33, which will not be repeated here.

[0066] Through the above manner, the relative sliding track of the wedge base and the side plate is restrained, and the inclining or swinging of the wedge base during the sliding process is avoided, which guarantee the stability of the operation of the rotational force driving assembly.

[0067] When uninstalling the process cartridge from the printer, the rotational force driving head 21 provided in the printer acts on the rotational force receiving component 61; then the rotational force receiving component 61 acts on the wedge base 133 so that the wedge base 133 slides with respect to the side plate 4, as shown in Fig. 35. At this time, the another inclined plane 1333b on the wedge base 133 relatively slides with respect to another inclined surface 421 b of the side plate 4, the base protrusion 1332a of the wedge base slides with respect to the inclined plane 423a2 on the protrusion 423a of the side plate 4 and the plane 423b5 on the other side, the movement of the wedge base 133 is, as described above, limited between the surface 423a2 and 421 b and between the surface 423b5 and 1375, the inclining or swinging of the wedge base 133 during the sliding process is avoided, which guarantees the stability of the operation of the rotational force driving assembly. Similarly, the protrusion 1332b has the same relative movement in the concave portion 422a, which will not be repeated here.

[0068] The above situation occurs when the rotational force receiving component is subjected to an external force. When the external force disappears, the wedge base can return to the initial state under the action of the spring. Finally, it should be noted that the foregoing embodiments are merely intended for describing the technical solutions of the present invention, but not for limiting the present invention. Although the present invention is described in detail with reference to the foregoing embodiments, persons of ordinary skill in the art should understand that they may still make modifications to the technical solutions described in the foregoing embodiments or make equivalent replacements to some or all technical features thereof, without departing from the scope of the technical solutions of the embodiments of the present invention.

Claims

1. A rotational force driving assembly, disposed on an end of a process cartridge, and configured to receive a driving force from outside and transmit the driving force to a rotating member that is disposed in the process cartridge along a length direction of the process cartridge, wherein the rotational force driving assembly comprises a rotational force receiving component and an adjusting mechanism;
the rotational force receiving component is configured to receive the driving force; and
the adjusting mechanism is connected to the rotational force receiving component, and enables the rotational force receiving component to shift in a longitudinal direction of the process cartridge and enables an axis of the rotational force receiving component to offset with respect to an axis of said photosensitive member.
2. The rotational force driving assembly according to claim 1, wherein the adjusting mechanism comprises a side plate and an adjusting component, a bevel is disposed on a bottom surface of the side plate, correspondingly, the adjusting component is provided with a bevel opposite to the bevel on the side plate bottom surface, and after the rotational

force driving assembly is assembled, the bevel on the side plate and the bevel on the adjusting component fit with each other and can slide with respect to each other.

3. The rotational force driving assembly according to claim 2, wherein the rotational force receiving component is disposed penetrating the side plate and the adjusting component, and the rotational force receiving component and the adjusting component both slide with respect to the side plate.
4. The rotational force driving assembly according to claim 3, wherein the rotational force driving assembly further comprises a gear that is fixedly disposed on an end portion of the rotating member and a spring that is disposed in the gear.
5. The rotational force driving assembly according to claim 4, further comprising an intermediate connection portion that is connected between the rotational force receiving component and the rotating member and configured to transmit force.
6. The rotational force driving assembly according to claim 5, wherein the intermediate connection portion is a coupling, the coupling comprises an upper end portion, a middle sliding block, and a cylinder, the upper end portion and the middle sliding block are connected through a key and a key slot and can slide with respect to each other, and the cylinder and the middle sliding block are connected through a key and a key slot and can slide with respect to each other.
7. The rotational force driving assembly according to claim 6, wherein the upper end portion and the cylinder are disposed on two opposite sides of the middle sliding block.
8. The rotational force driving assembly according to claim 6, wherein the spring abuts between the gear and the cylinder.
9. The rotational force driving assembly according to claim 3, wherein the adjusting component comprises a circular sleeve that is sleeved on the bottom of the rotational force receiving component and bosses that are symmetrically disposed on the side wall of the circular sleeve.
10. The rotational force driving assembly according to claim 9, wherein the boss inclines with respect to an axis of the circular sleeve, and an inclined surface of the boss is the bevel on the adjusting component.
11. The rotational force driving assembly according to claim 2, wherein the adjusting mechanism and the rotational force receiving component are integrally formed.
12. The rotational force driving assembly according to claim 1, wherein the rotational force receiving component comprises a "U" shape head portion.
13. The rotational force driving assembly according to claim 4, wherein at least a portion of the intermediate connection portion between the rotational force receiving component and the rotating member is provided as reelable, and the reelable portion is a flexible shaft.
14. The rotational force driving assembly according to claim 13, wherein the adjusting mechanism is a base, the base is disposed in the side plate and can slide with respect to the side plate, and the spring abuts between the base and the gear; and the rotational force receiving component penetrates the side plate and the base and is connected to the side plate and the base in such a manner that the rotational force receiving component can rotate with respect to them, the flexible shaft has one end connected to the rotational force receiving component that penetrates the side plate, and the other end connected to the gear, and the spring is sleeved on the flexible shaft.
15. The rotational force driving assembly according to claim 14, wherein the base is a wedge base, a middle portion of the wedge base is provided with a through hole configured to fit with the rotational force receiving component, the wedge base has two inclined surfaces on two opposite sides, other two opposite sides of the wedge base are provided with protrusions, a middle portion of the side plate has a hollow portion configured to place the wedge base, the inner surface of opposite sides of the hollow portion is provided with two opposite plane surfaces and a pair of inclined surfaces that are opposite and configured to fit with the inclined surfaces of the wedge base, and the two opposite plane surfaces are separately provided with concave

portions that fit with the protrusions on the wedge base.

16. The rotational force driving assembly according to claim 15, wherein the protrusions on the two opposite sides of the wedge base are arranged stagger so that opposite positions are not in a connection line, and the concave portions on the plate are correspondingly arranged stagger so that opposite positions are not in a connection line.
17. The rotational force driving assembly applied to a process cartridge according to claim 16, wherein the shape of the concave portion is a structure like an inverted triangle with an upper end opening narrower than a lower end opening, the inverted triangle structure has inclined surfaces opposite on two sides, and a protrusion portion is disposed at a narrow portion for the concave portion.
18. The rotational force driving assembly applied to a process cartridge according to claim 17, wherein an upper end portion of the protrusion portion on the concave portion is provided with a vertex, the inclined surfaces are on two sides of the vertex, and the protrusion portion further comprises two opposite plane surfaces.
19. The rotational force driving assembly applied to a process cartridge according to claim 18, wherein in a natural state, the protrusions on the plane surface on the two sides of the wedge base are correspondingly above the vertex of the protrusion on the concave portion; and when the rotational force receiving component receives an external force, the protrusions on the opposite sides of the wedge base separately slide with respect to the inclined surfaces on the two concave portions.
20. The rotational force driving assembly applied to a process cartridge according to claim 14, wherein a body portion of the rotational force receiving component is of a -cylinder, an outer periphery of the body portion is provided with a boss, a diameter of the boss fits with the base through hole of the wedge base, an end portion of the body portion is provided with a slot, and the rotational force receiving component is connected to the slot and the base by using a latching buckle.
21. The rotational force driving assembly according to claim 14, wherein the flexible shaft is formed by winding a plurality of layers of steel wires, and winding directions of inner and outer layers of steel wires are the same.
22. The rotational force driving assembly according to claim 14, wherein the flexible shaft has one end connected to the rotational force receiving component by using a square hole or a square block, and the other end connected to a hub of the photosensitive member by using a square hole or a square block.
23. A process cartridge, comprising the rotational force driving assembly according to any one of claims 1 to 22.
24. An image forming device, comprising a rotational force driving head that can provide a rotational force and the process cartridge according to claim 23, wherein the rotational force driving head engages with the rotational force driving assembly to transmit the force to a rotating member in the process cartridge.

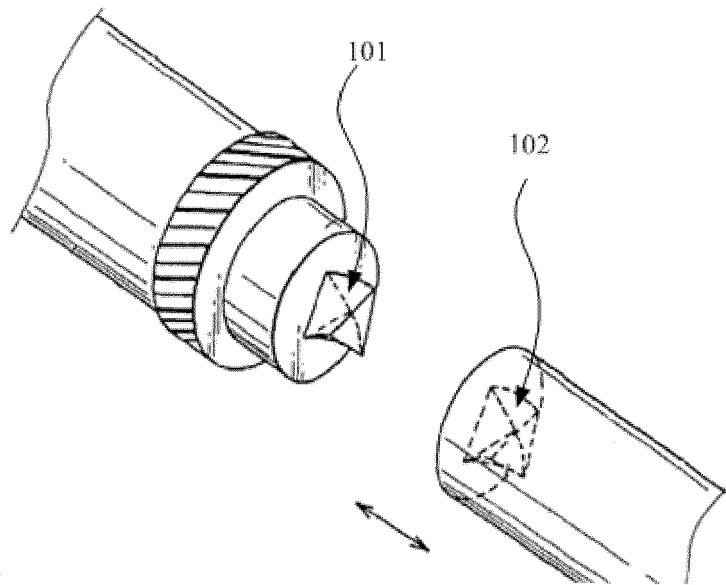


Fig. 1

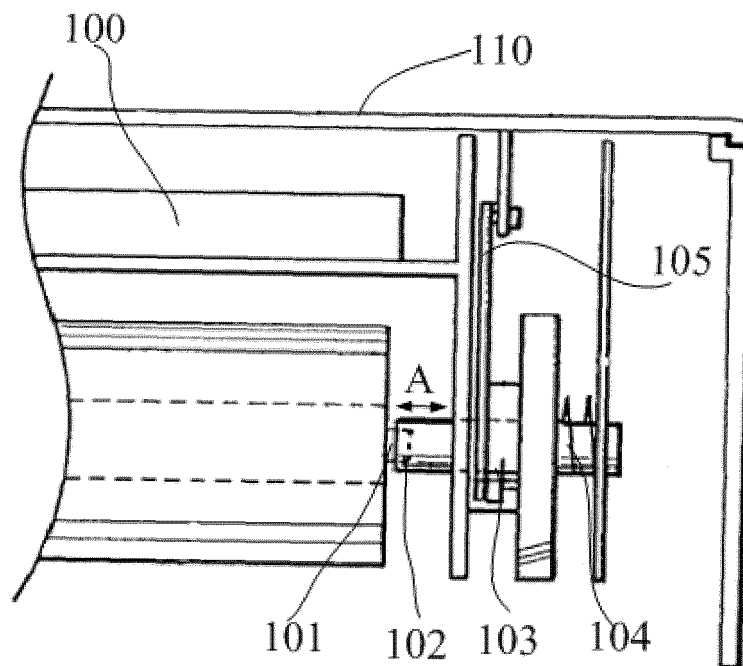


Fig. 2

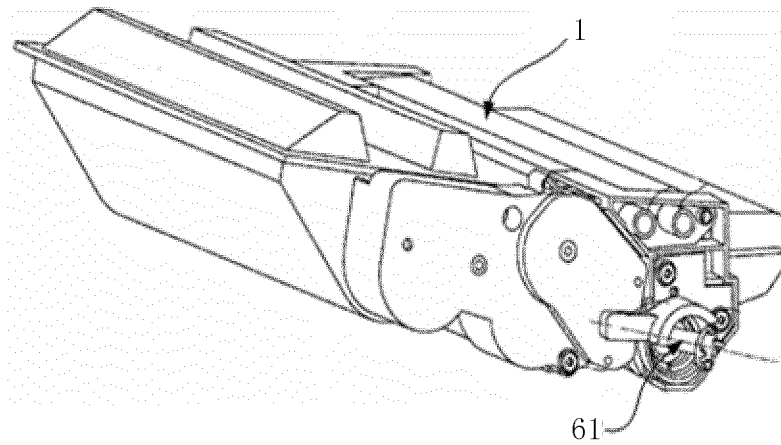


Fig. 3

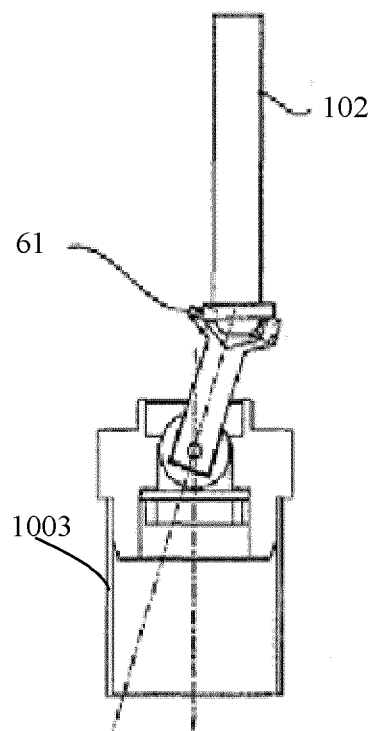


Fig. 4(a)

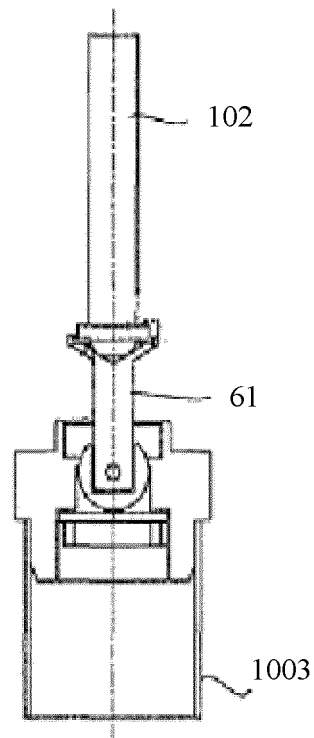


Fig. 4(b)

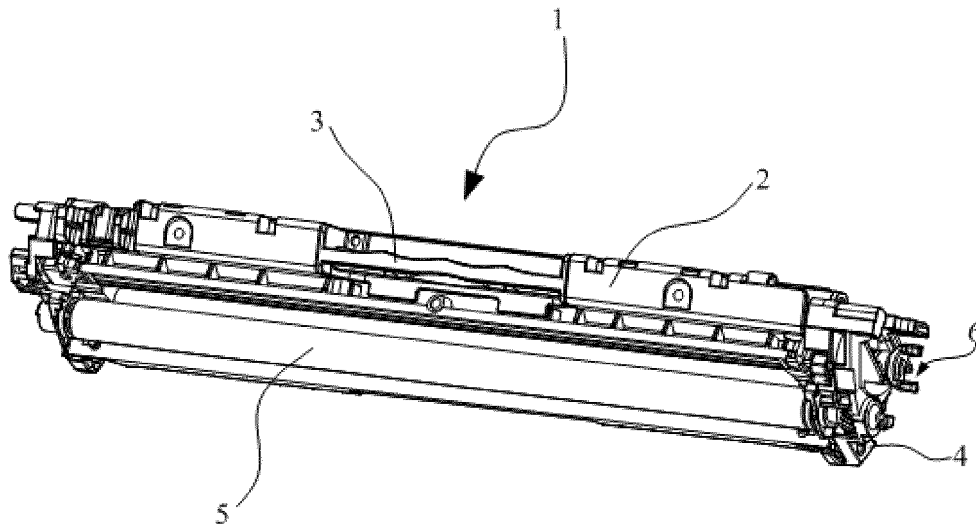


Fig. 5

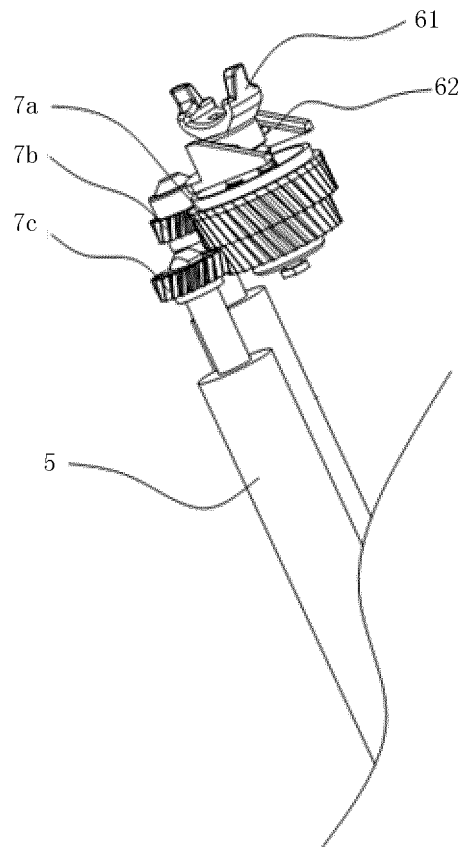


Fig. 6

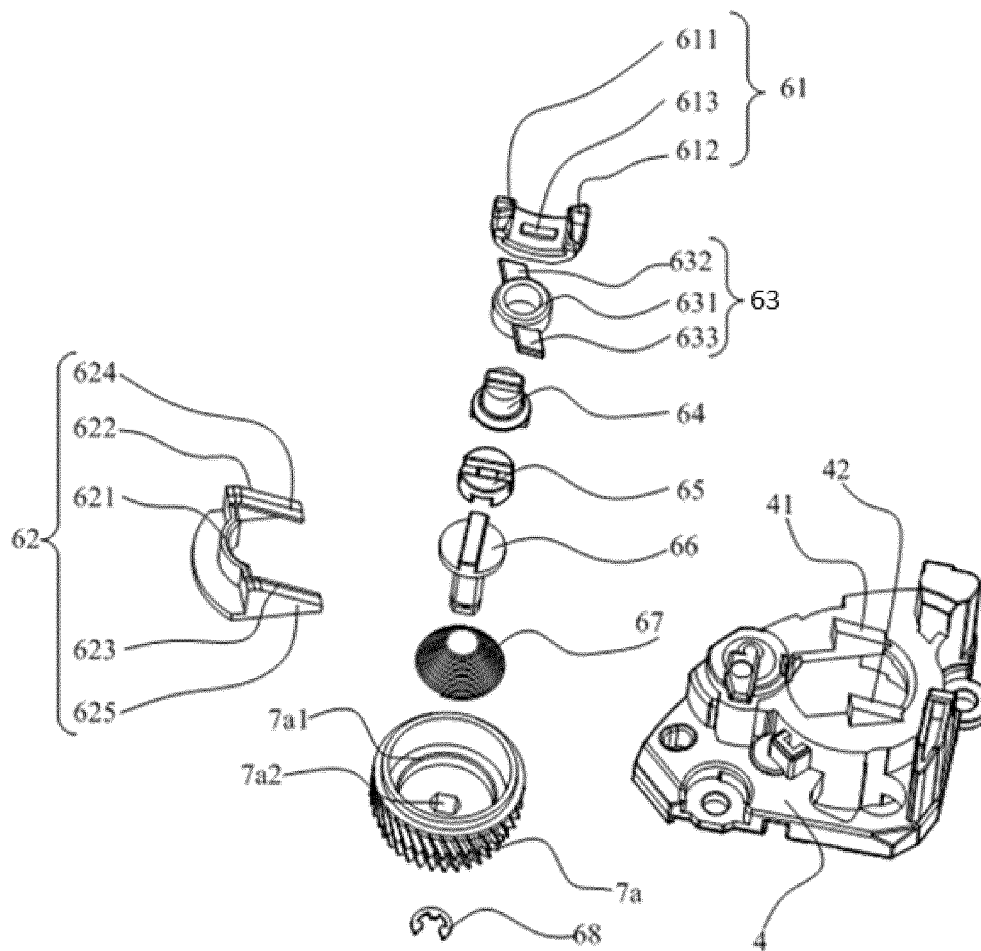


Fig. 7

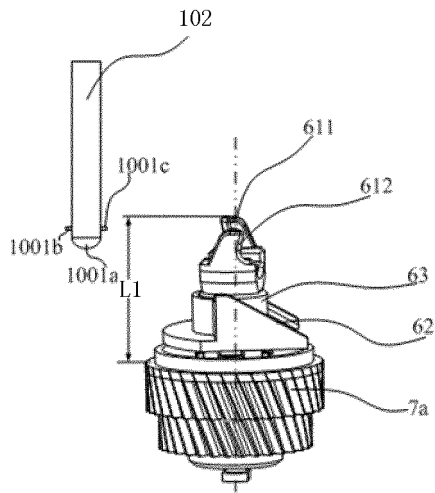


Fig. 8

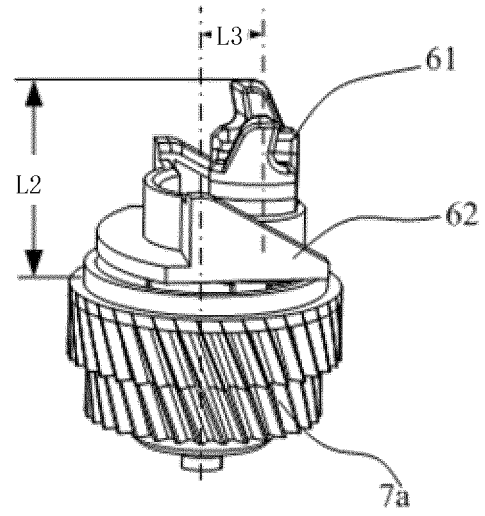


Fig. 9

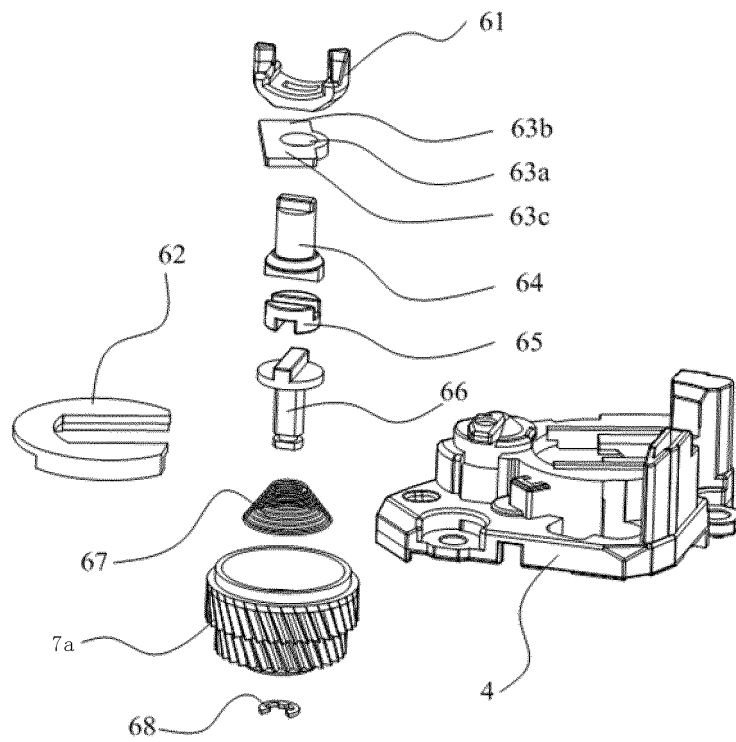


Fig. 10

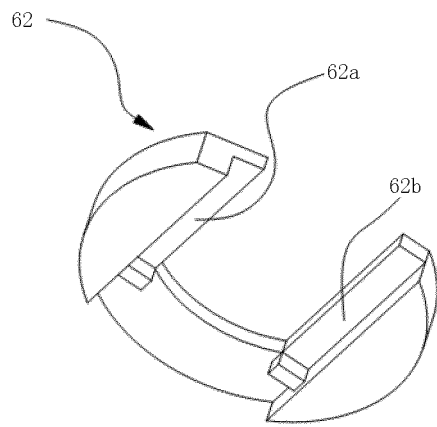


Fig. 11

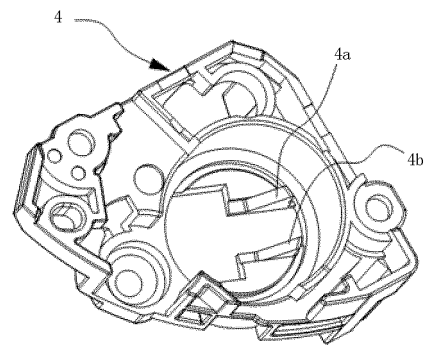


Fig. 12

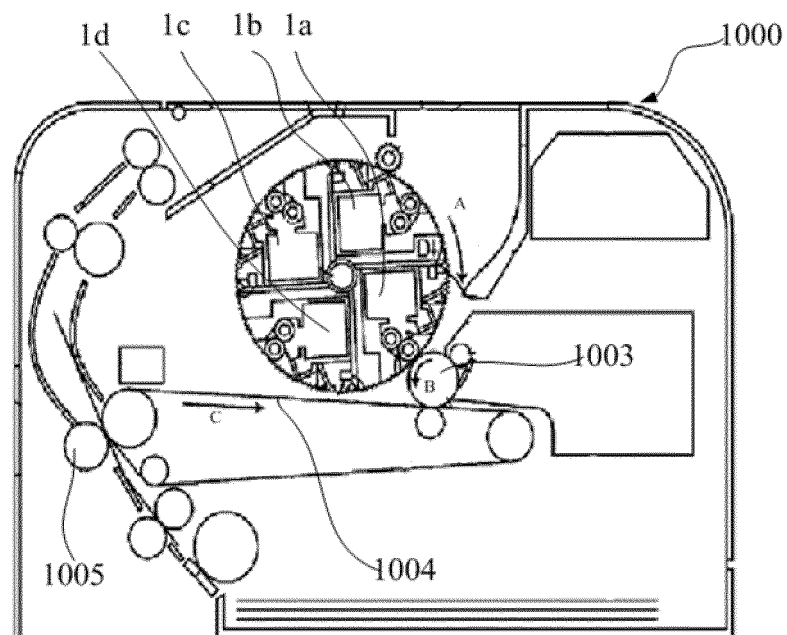


Fig. 13

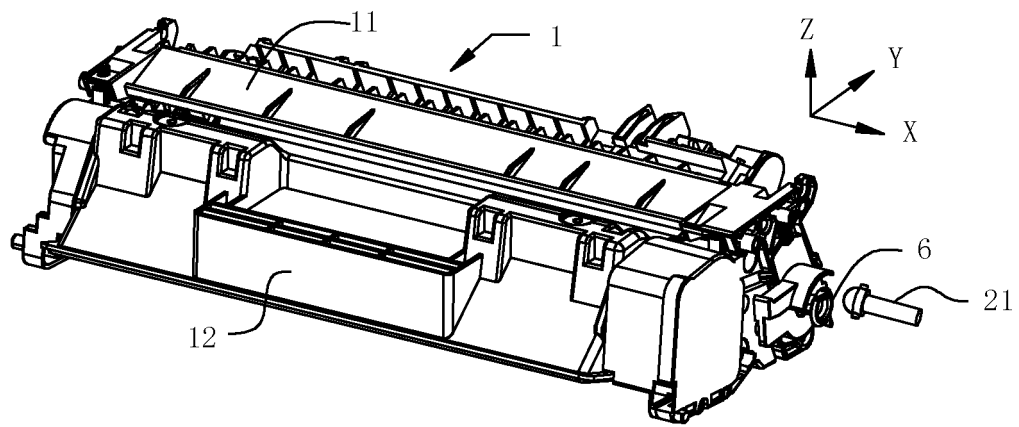


Fig. 14

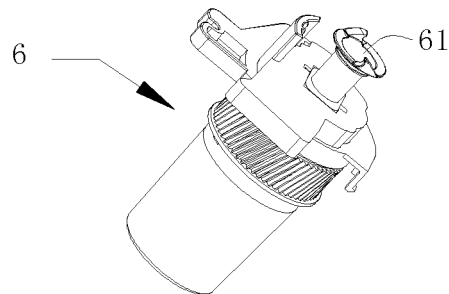


Fig. 15

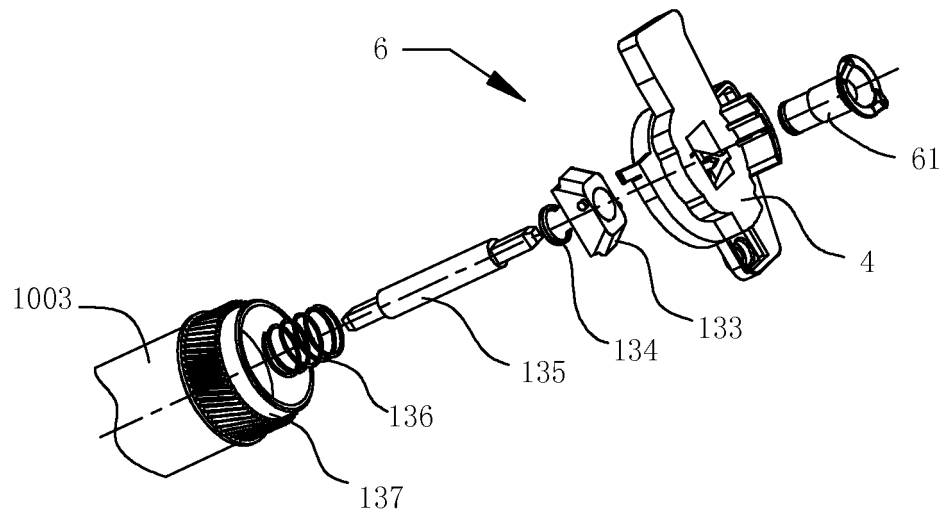


Fig. 16

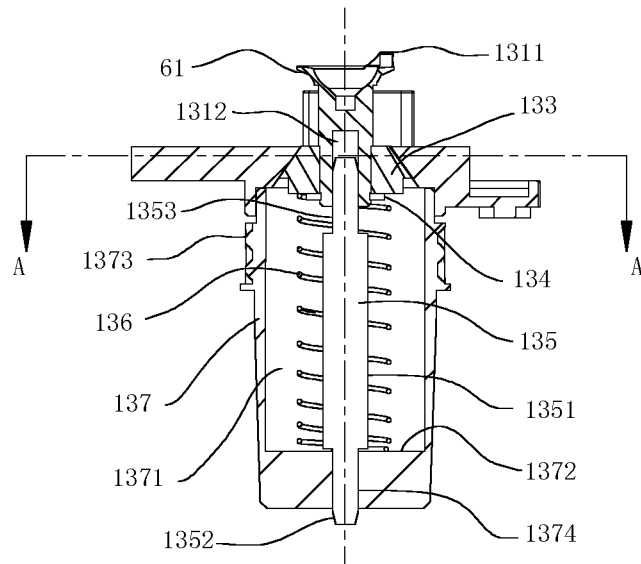


Fig. 17

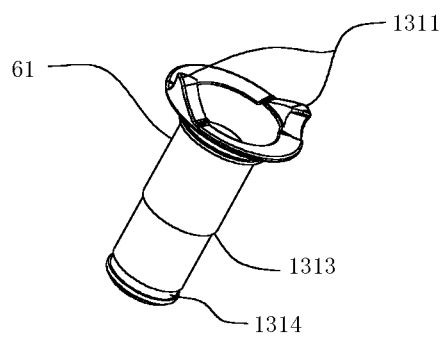


Fig. 18

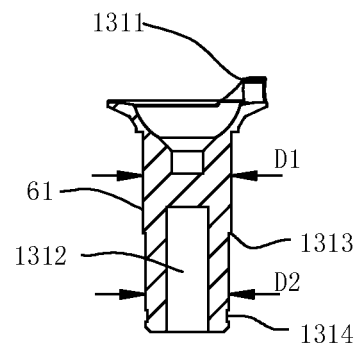


Fig. 19

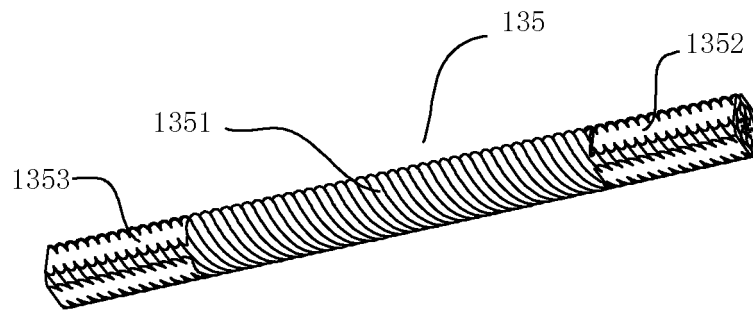


Fig. 20

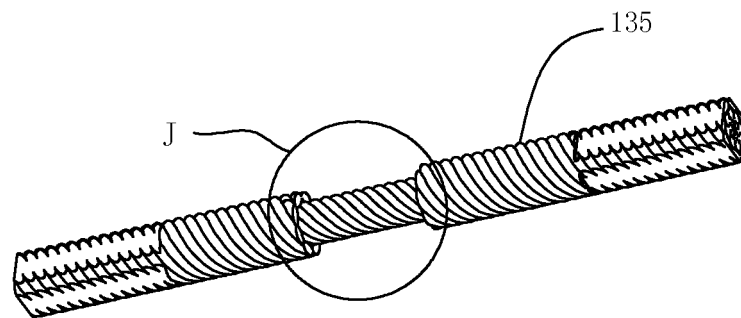


Fig. 21

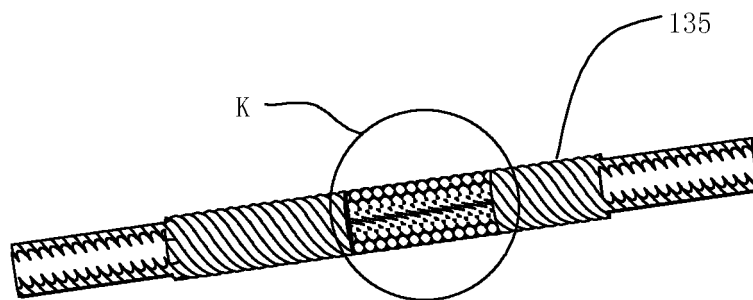


Fig. 22

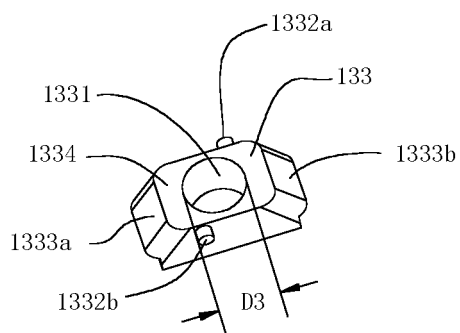


Fig. 23

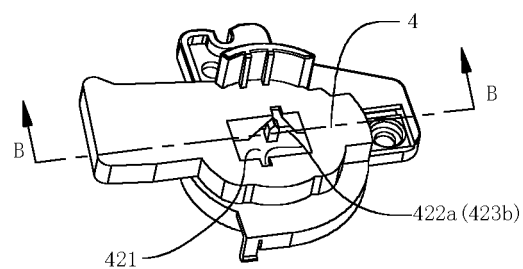


Fig. 24

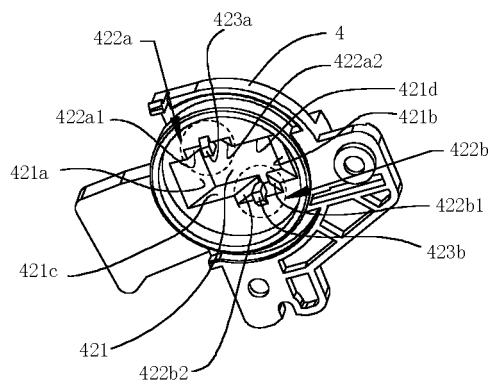


Fig. 25

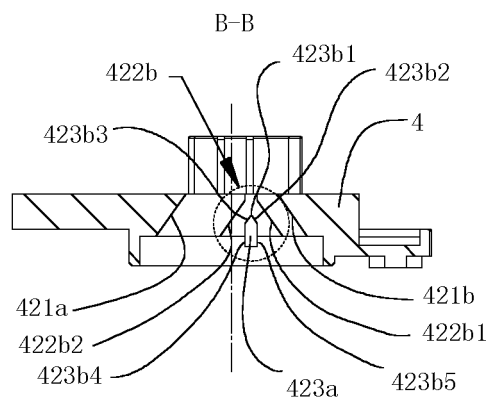


Fig. 26

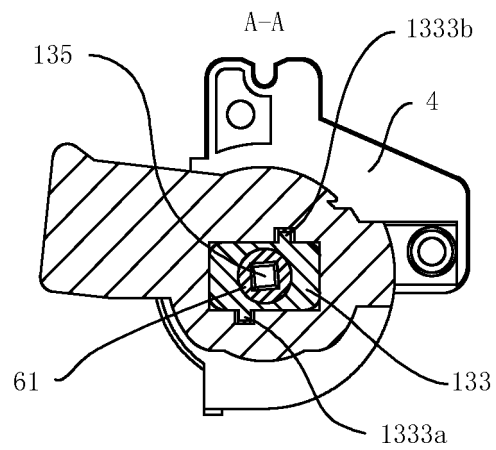


Fig. 27

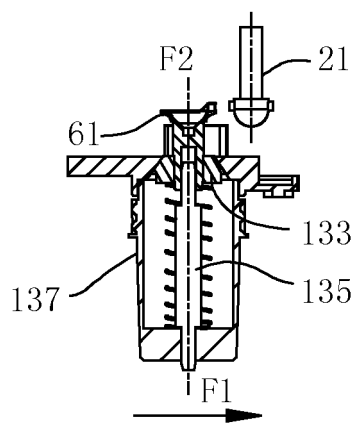


Fig. 28a

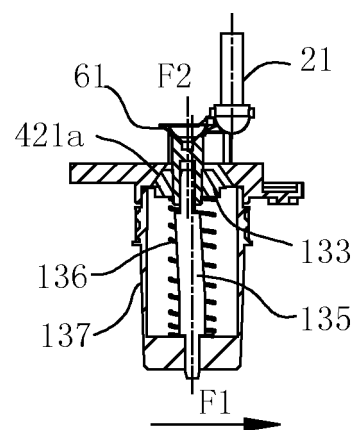


Fig. 28b

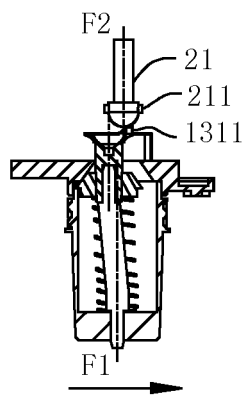


Fig. 28c

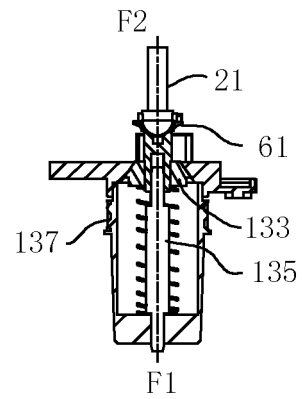


Fig. 28d

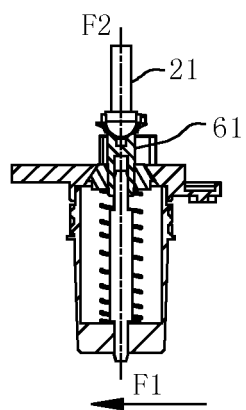


Fig. 29a

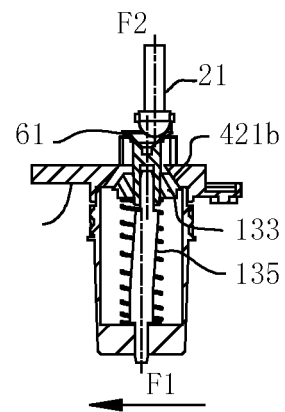


Fig. 29b

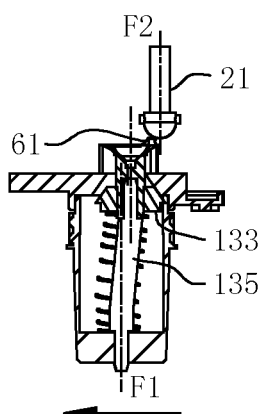


Fig. 29c

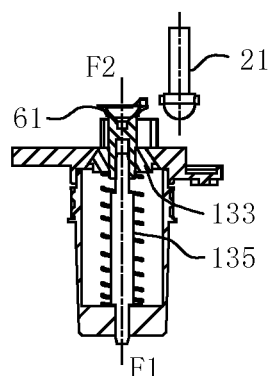


Fig. 29d

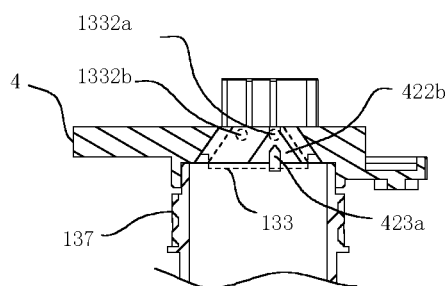


Fig. 30

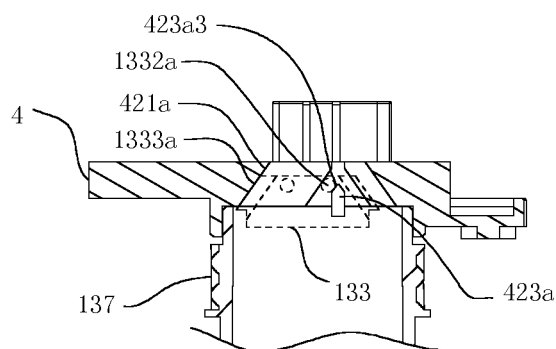


Fig. 31

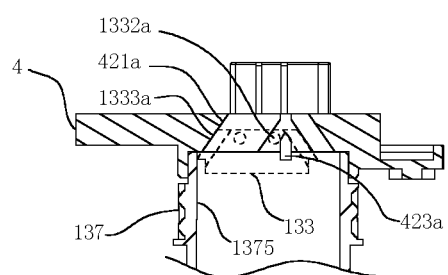


Fig. 32

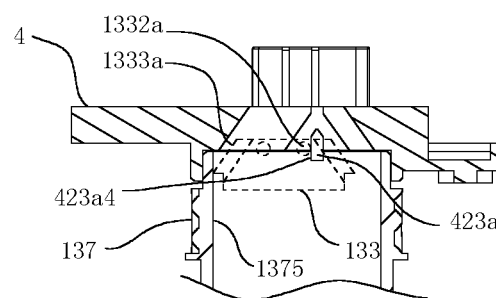


Fig. 33

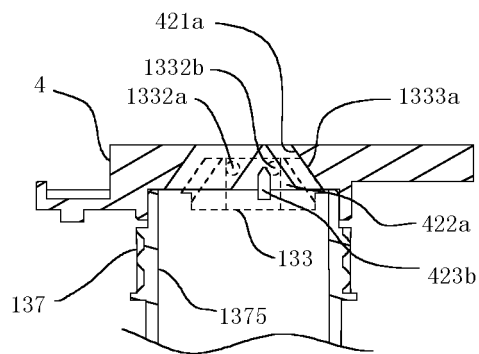


Fig. 34

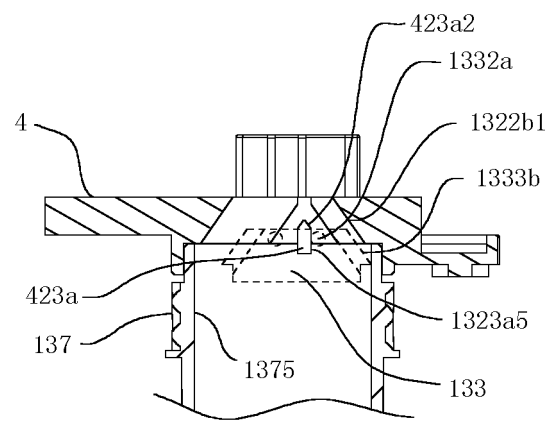


Fig. 35

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2015/084489

A. CLASSIFICATION OF SUBJECT MATTER

G03G 21/18 (2006.01) i

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)

G03G 21/18

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; EPODOC; WPI; CNKI: image formation, image processing, image forming apparatus, developer cartridge, rotary force, axis, axial direction, offset, displacement, incline, photosensitive element, photosensitive drum, process cartridge, photoreceptor, gear, rotat+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 103809420 A (ZHUHAI SEINE TECHNOLOGY CO., LTD), 21 May 2014 (21.05.2014), description, paragraphs [0052]-[0054] and [0068], and figures 1-6	1-5, 11-14, 20-24
A	CN 103713501 A (JIANGXI LEIBOTAI ELECTRONIC TECHNOLOGY CO., LTD.), 09 April 2014 (09.04.2014), the whole document	1-24
A	CN 102109806 A (BROTHER INDUSTRIES, LTD.), 29 June 2011 (29.06.2011), the whole document	1-24
A	CN 103439871 A (ZHUHAI SEINE TECHNOLOGY CO., LTD), 11 December 2013 (11.12.2013), the whole document	1-24
A	US 2010028050 A1 (CANON KK), 04 February 2010 (04.02.2010), the whole document	1-24

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

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"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	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 02 September 2015 (02.09.2015)	Date of mailing of the international search report 18 September 2015 (18.09.2015)
Name and mailing address of the ISA/CN: 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 ZHANG, Bin Telephone No.: (86-10) 82245122

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2015/084489

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 103809420 A	21 May 2014	None	
CN 103713501 A	09 April 2014	None	
CN 102109806 A	29 June 2011	JP 5428846 B2	26 February 2014
		US 2011159970 A1	30 June 2011
		US 8655221 B2	18 February 2014
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		CN 103454894 A	18 December 2013
		CN 102141766 A	03 August 2011
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		JP 4345989 B1	14 October 2009
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		US 8326185 B2	04 December 2012
		CN 101639648 B	04 April 2012

Form PCT/ISA/210 (patent family annex) (July 2009)