(19) Europäisches Patentamt
European Patent Office
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(11) **EP 1 863 050 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.12.2007 Bulletin 2007/49

(51) Int Cl.:
H01H 19/50 *(2006.01)*

(21) Application number: **07252136.2**

(22) Date of filing: **24.05.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **01.06.2006 CN 200620073525 U**

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(54) **Switch assembly**

(57) The present invention relates to a switch mechanism (5) including a magnetic switch (13) having a first button (14) and a second button (16), a lever switch (15) having a lever button (45), a faceplate (50), a rotary knob (11) mounted on the faceplate and a trigger assembly connected to the rotary knob so as to selectively trigger the first and second buttons of the magnetic switch and the lever button of the lever switch when the rotary knob is located at different positions on the faceplate. Different working states of the motor are controlled by operating a single rotary knob which makes operation simple and safe.

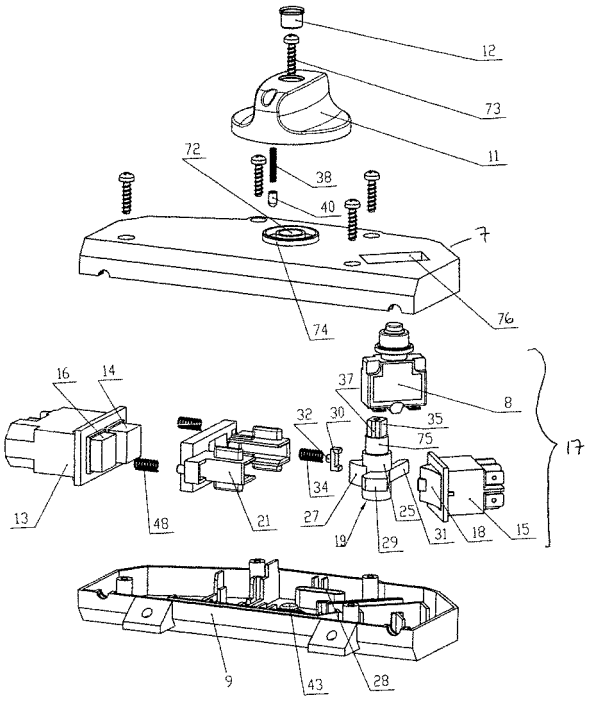

Fig.3

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Description

[0001] The present invention relates to a switch mechanism.

[0002] A commercial switch mechanism such as the one used for a shredder commonly includes a magnetic switch and a trigger switch. The assembly controls different working states of the shredder motor via an electrical path between the magnetic switch, the trigger switch and the motor to control starting and stopping of the motor and to cause instantaneous reverse rotation (reverse point-action) for releasing blockages. The magnetic switch commonly includes a winding, an attraction piece and a lever member. The magnetic force generated by the electrified winding attracts the attraction piece to maintain the conduction state. During operation of the magnetic switch, a lever button is in a fully triggered state. After power interruption or after the electrical path is turned off, the magnetic switch is electrically conductive so that the machine or tool is in the operational state without the lever button being operated. Once power is restored, misoperation is possible and there is a safety risk to the operator. Additionally, a switch mechanism of this type has several different buttons and the operator must operate two different buttons to achieve one desired function. For example, in order to make the motor reverse rotate, the operator must operate the reverse button and the operating button simultaneously. An operator who uses such a machine for the first time frequently does not know how to achieve a desired function when faced with so many buttons.

[0003] The present invention seeks to address certain disadvantages referred to above by providing a switch mechanism which is simple to operate and has more comprehensive and reliable performance.

[0004] Thus viewed from one aspect the present invention provides a switch mechanism for a tool or machine comprising:

a magnetic switch having a first button and a second button;
a lever switch having a lever button;
a faceplate mountable on the tool or machine;
a rotary knob mounted on the faceplate so as to be selectively positionable by rotation at a first position, a second position, a third position and a fourth position relative to the faceplate; and
a trigger assembly connected or coupled to the rotary knob, wherein the trigger assembly

(1) triggers the first button when the rotary knob is positioned at the first position;
(2) triggers the second button when the rotary knob is positioned at the second position;
(3) at least partially releases the second button when the rotary knob is positioned at the third position; and
(4) triggers the second button and the lever button simultaneously when the rotary knob is positioned at the fourth position.

[0005] The present invention advantageously provides different working states of the motor which are controlled by operating a single rotary knob. This makes operation simple and safe and since the single rotary knob is mounted on the cover of the shredder, there is an increased aesthetic benefit.

[0006] The first and second buttons of the magnetic switch may be replaced by a single lever button. The first and second buttons may be side-by-side. The magnetic switch may comprise a non-operational frame in which is mounted each of the first and second button.

[0007] The faceplate may be a substantially annular faceplate.

[0008] Preferably when the rotary knob is positioned at the third position, the trigger assembly partially releases the second button and partially depresses the first button.

[0009] Preferably the first button is a stopping button and the second button is an operating button.

[0010] In a preferred embodiment, the switch mechanism further comprises:

a sliding member attached or coupled to the rotary knob,

wherein the faceplate defines a first sliding slot and the sliding member is slidable in the first sliding slot between a first delimiting position and a second delimiting position, wherein the trigger assembly triggers the second button when the sliding member is located at the first delimiting position in the first sliding slot and the trigger assembly at least partially releases the second button of the magnetic switch when the sliding member is located at the second delimiting position in the first sliding slot.

[0011] The first and second sliding slot may be circumferentially disposed along a circle. The first and second sliding slot may be substantially kidney-shaped.

[0012] Preferably the sliding member is a push rod projecting beyond a bottom surface of the rotary knob.

[0013] Preferably the rotary knob defines a longitudinal socket and a resilient member in the socket couples a base of the longitudinal socket with the sliding member to leave the sliding member partly exposed from the socket.

[0014] Preferably the faceplate further defines a second sliding slot and the sliding member is slidable in the second sliding slot between a first delimiting position and a second delimiting position, wherein the trigger assembly triggers the first button of the magnetic switch when the sliding member is located at the first delimiting position of the second sliding slot and the trigger assembly triggers the second button of the magnetic switch and the lever button of the lever switch simultaneously when the sliding member is located at the second delimiting position in the second sliding slot.

[0015] The first and second sliding slot may be circumferentially disposed along a circle. The first and second sliding slot may be substantially kidney-shaped.

[0016] In a preferred embodiment, the trigger assembly includes: a multi-lobal trigger body connected or coupled to the rotary knob; and a reciprocal positioning cradle adjacent to and engageable with the trigger body.

[0017] The reciprocal positioning cradle is preferably slotted.

[0018] Preferably the trigger body includes:

a substantially cylindrical shaft;
a cam lobe extending rotationally outwardly from the shaft which is rotationally engageable with the first button of the magnetic switch to partially depress or trigger the first button,
a first pushing lobe extending rotationally outwardly from the shaft which is rotationally engageable with the lever button of the lever switch to trigger the lever button and with the positioning cradle to trigger the second button of the magnetic switch,
a second pushing lobe extending rotationally outwardly from the shaft which is rotationally engageable with the positioning cradle to trigger the second button of the magnetic switch; and
a third pushing lobe extending rotationally outwardly from the shaft which is rotationally engageable with the positioning cradle to trigger the second button of the magnetic switch.

[0019] Preferably the third pushing lobe is a pair of pushing lobes axially spaced apart along the shaft in a substantially common radial direction.

[0020] Preferably the first pushing lobe and the second pushing lobe extend radially outwardly in a substantially common plane.

[0021] The cam lobe, the first pushing lobe, the second pushing lobe and the third pushing lobe may be substantially equiangularly disposed about the shaft. The first pushing lobe, the second pushing lobe and the third pushing lobe may be multi-faceted. The first pushing lobe, the second pushing lobe and the third pushing lobe may be substantially triangular.

[0022] Preferably the reciprocal positioning cradle includes a reciprocal base capable of reciprocally biassing the second button of the magnetic switch and a pair of laterally (eg horizontally) spaced apart runners extending rearwardly from an interior face of the reciprocal base, wherein each runner defines a positioning slot, wherein the reciprocal base defines a socket to receive the first button of the magnetic switch.

[0023] Each runner may be substantially square C-shaped. Between a non-operational surface of the magnetic switch and an exterior surface of the reciprocal base may be mounted one or more resilient biassing members (eg springs).

[0024] Preferably at least one of the pair of runners includes a pair of substantially parallel vertically spaced apart latching slots which communicate with the positioning slot, wherein the switch mechanism further comprises:

a substantially C-shaped latch mounted vertically with its arms in the pair of latching slots and slidable in the latching slots along the positioning slot, wherein a cylindrical finger extends from a base of the C-shaped latch and a first resilient biassing member is attached to a tip of the cylindrical finger, wherein the second pushing lobe is rotationally engageable with and drives the C-shaped latch into engagement with the reciprocal base to reciprocally bias the second button of the magnetic switch.

[0025] The first resilient biassing member may be a spring.

[0026] In a preferred embodiment, the switch mechanism further comprises:

an elongate switch housing, wherein the magnetic switch and the lever switch are mounted in and at opposite ends of the housing and the trigger assembly is mounted therebetween.

[0027] Preferably when the trigger assembly triggers the first button when the rotary knob is positioned at the first position, the tool or machine is non-operational.

[0028] Preferably when the trigger assembly triggers the second button when the rotary knob is positioned at the second position, the tool or machine is operational.

[0029] Preferably when the trigger assembly at least partially releases the second button when the rotary knob is positioned at the third position, the tool or machine is operational.

[0030] Preferably when the trigger assembly triggers the second button and the lever button simultaneously when the rotary knob is positioned at the fourth position, the tool or machine is in reverse rotation.

[0031] Preferably the lever button is capable of causing the tool or machine to reverse rotate.

[0032] Viewed from a further aspect the present invention provides a shredder comprising a switch mechanism as defined hereinbefore.

[0033] The present invention will now be described in a non-limitative sense with reference to the accompanying Figures in which:

Figure 1 is a partial exploded perspective view of an embodiment of the switch mechanism according to the present invention in a shredder;
Figure 2 is an enlarged plane view of a faceplate of the switch mechanism of Figure 1;
Figure 3 is an exploded perspective view of the switch mechanism of Figure 1;
Figure 4 is a perspective view of the switch mechanism of Figure 3;
Figure 5 is a first perspective view of a reciprocating

cradle of the switch mechanism of Figure 3;
Figure 6 is a second perspective view of the reciprocating cradle of the switch mechanism of Figure 3;
Figure 7 is a front view of the switch mechanism of Figure 3;
Figure 8 is a cross-sectional view along A-A line of Figure 7;
Figure 9 is a plan view of a rotary knob of the switch mechanism in a first position;
Figure 10 is a top view of the rotary knob in the position shown in Figure 9 after a top cover of the switch housing is removed;
Figure 11 is a plan view of the rotary knob of the switch mechanism in a second position;
Figure 12 is a top view of the rotary knob in the position shown in Figure 11 after the top cover of the switch housing is removed;
Figure 13 is a plan view of a rotary knob of the switch mechanism in a third position;
Figure 14 is a top view of the rotary knob in the position shown in Figure 13 after the top cover of the switch housing is removed;
Figure 15 is a plan view of the rotary knob of the switch mechanism in a fourth position; and
Figure 16 is a top view of the rotary knob in the position shown in Figure 15 after the top cover of the switch housing is removed.

[0034] Illustrated in Figure 1 is an embodiment of the switch mechanism 5 of the invention mounted in a shredder. The shredder includes a frame 1 and a head portion 2 pivotally attached to the frame 1. A driving motor (not shown) is arranged inside the head portion 2. The head portion 2 defines an inlet 4 for inserting trees to be shredded and the switch mechanism 5 is arranged at an edge of the inlet 4. The switch mechanism 5 is electrically connected to the driving motor via electrical circuitry (not shown) and controls different operational states of the motor. In a first operational state, the motor is stopped. In a second and third operational state, the motor rotates. In a fourth operational state, the motor is in reverse rotation (reverse point-action) to enable removal of a blockage.

[0035] Referring to Figures 2 to 4, the switch mechanism 5 includes an annular faceplate 50, a rotary knob 11 rotationally mounted on the faceplate 50 and a switch housing containing various elements (see Figures 3 and 4). The faceplate 50 is mounted on a cover 3 of the head portion 2. A receiving bore 52 is defined in a central portion of the faceplate 50. The mouth of the receiving bore 52 is surrounded by a first lip 500. A second lip 501 is coaxial with the first lip 500 and defined between the first lip 500 and second lip 501 is an annular groove 54. A first sliding slot 49 and a second sliding slot 51 are defined in the annular groove 54. The first and second sliding slots 49, 51 are substantially kidney-shaped. Four labels a, b, c, and d are formed near to the perimeter of the faceplate 50 and the rotary knob 11 may selectively align with each of the four labels a-d to define four operating positions (as described below).

[0036] The switch housing (see Figures 3 and 4) has a top cover 7 fitted to a bottom cover 9. A conventional magnetic switch 13 having a stopping button 14 and an operating button 16, a lever switch 15 having a lever button 18 and a trigger assembly 17 for triggering the magnetic switch 13 and the lever switch 15 are housed in the top and bottom covers 7, 9. Tail portions of the magnetic switch 13 and lever switch 15 are electrically connected to conventional electrical circuitry.

[0037] A cylindrical through hole 72 is formed in a central portion of the top cover 7. A positioning rib 74 is formed on a top face of the top cover 7 coaxial with the through hole 72 and is positioned in the receiving bore 52 of the faceplate 50. At a first end of the top cover 7, there is a substantially square socket 76. An overload protection member 8 is housed inside the switch housing to automatically shut off the power to the motor when the motor is overloaded. A top end of the overload protection member 8 passes through the substantially square socket 76 and is exposed from the top face of the frame 3.

[0038] Referring to Figure 8, a longitudinal socket 44 is defined in a bottom face of the rotary knob 11 and houses a spring 38 which at a proximal end is attached to the base of the longitudinal socket 44 and at a distal end to a push rod 40 to leave the push rod 40 partially exposed from the longitudinal socket 44. The push rod 40 is slidable in the first sliding slot 49 between a first delimiting position 60 and second delimiting position 62 at opposite ends of the sliding slot 49.

[0039] Referring to Figures 3 and 8, the trigger assembly 17 is connected to the rotary knob 11 and selectively triggers the magnetic switch 13 and lever switch 15. The trigger assembly 17 includes a trigger body 19 which is multi-lobal and a reciprocal positioning cradle 21 capable of accommodating the trigger body 19. The trigger body 19 includes a cylindrical main shaft 25. A cam lobe 27 extends radially outwardly from a peripheral surface of the main shaft 25. A first pushing lobe 29 and a second pushing lobe 31 extend radially outwardly in a common plane from a peripheral surface of the main shaft 25. An axially spaced apart pair of third pushing lobes 33 extends outwardly from top and bottom portions respectively of the peripheral surface of the main shaft 25 in a common radial direction (see Figure 8). The cylindrical main shaft 25 extends axially into an intermediate portion 75 having a smaller diameter. The intermediate portion 75 terminates in a rectangular linking portion 35. The intermediate portion 75 is received in the cylindrical through hole 72 of the top cover 7. A rib 37 is formed on a side face of the linking portion 35.

[0040] A central portion of the rotary knob 11 is equipped with a bore 71 which is divided into top and bottom chambers by a neck 10. The top chamber is adapted to receive a knob cap 12 and the bottom chamber configurationally matches and receives the linking portion 35. A screw 73 is inserted through the top cham-

ber of the bore 71 into the neck 10 and threadedly engages a screw hole 39 of the linking portion 35 to couple the trigger body 19 securely to the rotary knob 11. A positioning hole 41 in communication with the screw hole 39 is defined in a central portion of the base of the trigger body 19. A positioning post 43 projects upwardly from a central portion of the bottom cover 9 into the positioning hole 41 1 thereby permitting the rotary knob 11 to rotate and drive the trigger body 19 to rotate about the positioning post 43.

[0041] Referring to Figures 5 and 6, the reciprocal positioning cage 21 is housed in the top and bottom covers 7, 9 adjacent to the trigger body 19. The reciprocal positioning cage 21 includes a reciprocal base 20 and a pair of parallel, horizontally spaced apart runners 22 extending from the reciprocal base 20. Each runner 22 defines a horizontally extending positioning slot 24 with an open end and is substantially square C-shaped. The first and second pushing lobes 29, 31 of the trigger body 19 are slidably received respectively in the positioning slots 24. In the top and bottom surface respectively of one of the runners 22 is a pair of parallel spaced apart latching slots 23 which communicate with the positioning slot 24. In a middle portion of the reciprocal base 20 between the runners 22 is defined a socket 36 in which is received the stopping button 14 of the magnetic switch 13.

[0042] Referring to Figures 3 and 8, a substantially C-shaped latch 30 is mounted vertically with its arms in the pair of latching slots 23 and is slidable in the latching slots 23 along the positioning slot 24. A cylindrical finger 32 extends from a base of the C-shaped latch 30. A first resilient biassing spring 33 is attached to a tip of the cylindrical finger 32 and abuts against a wall 44 in the reciprocal base 20.

[0043] A pair of elongate connecting ribs 26 are formed on the top and bottom face of each runner 22 and slidably engage corresponding elongate receiving slots 28 in the top and bottom covers 7, 9, respectively. A connecting post 46 is formed on one end of each runner 22 either side of the reciprocal base 20. Mounted on each connecting post 46 is a second resilient biassing spring 48. A distal end of the second resilient biassing spring 48 abuts the housing 61 of the magnetic switch 13 (see Figure 10).

[0044] Referring to Figures 9 and 10, when the rotary knob 11 aligns with label a on the faceplate 50, the push rod 40 is located at the first delimiting position 64 in the second sliding slot 51. At the same time, the cam lobe 27 triggers the stopping button 14 whilst the operating button 16 and the lever button 18 are free. In this first operational state, the shredder is non-operational.

[0045] Referring to Figures 11 and 12, clockwise rotation of the rotary knob 11 to the second position aligned with label b causes the push rod 40 to slide to the first delimiting position 60 in the first sliding slot 49 and the trigger body 19 to be rotated clockwise so that the cam lobe 27 releases the stopping button 14. The first pushing lobe 29 rotates in the positioning slot 24 to horizontally bias the reciprocal base 20 forward and depress the operating button 16. This compresses the first resilient biassing spring 48 to define an equilibrium distance L between the abutting base 20 and the housing 61 of the magnetic switch 13 which is about 0.5mm and the operating button 16 is triggered. In this second operational state, the electrical circuitry conducts electricity and the motor rotates.

[0046] Referring to Figures 13 and 14, the rotary knob 11 is released from position b and the first resilient biassing spring 48 causes the reciprocal positioning cage 21 to be retracted and the push rod 40 to slide along the sliding slot 49 in the counterclockwise direction from the first delimiting position 60 to the second delimiting position 62. The rotary knob 11 rotates counterclockwise to the third position c. Accordingly, the operating button 16 is released from the trigger state and the distance H between the reciprocal base 20 and the housing 61 of the magnetic switch 13 is about 2.5mm *(ie* the operating button 16 is released by 2mm). The stopping button 14 is partially depressed by the cam lobe 27. Because the magnetic switch 13 is still powered, the electric circuit remains conductive and the motor continues to work. If power is interrupted, the electric circuit is broken. In order to restore power, the rotary knob 11 must be rotated to position b to trigger the operating button 16. This prevents misoperation and ensures operator safety. Moreover when the operating button 16 is to be released, it may be fully released (Figure 10) or partially released (Figure 14) without triggering the stopping button 14.

[0047] The configuration of the first sliding slot 49 may be changed so that the third position c may be located between the first position a and the second position b. When the shredder needs to be stopped, it is only necessary to rotate the rotary knob 11 counterclockwise to the first position a to make the cam lobe 27 of the trigger body 19 trigger the stopping button 14 as shown in Figures 9 and 10.

[0048] Referring to Figures 15 and 16, when the shredder is blocked, the motor is stopped as described above. The rotary knob 11 is then rotated counterclockwise to the fourth position (label d) and the push rod 40 slides in the second sliding slot 51 from the first delimiting position 64 to the second delimiting position 66. The first pushing lobe 29 rotates out of the corresponding positioning slot 24 and depresses the lever button 18 of the lever switch 15. The second pushing lobe 31 rotationally engages and drives the substantially C-shaped latch 30 which compresses the first resilient biassing spring 34 to cause the reciprocal base 20 to trigger the operating button 16. The pair of third pushing lobes 33 horizontally push the reciprocal base 20. Thus the motor is in the reverse rotation state. The rotary knob 11 is then released from position d and the restoring force of the first and second resilient biassing springs 34, 48 causes the trigger body 19 to rotate clockwise to release the operating button 16 and the lever button 18. The rotary knob 11 driven by the trigger body 19 rotates clockwise to its first position a and

the pushing rod 40 returns to the first delimiting position 64 along the second sliding slot 51 (see Figures 9 and 10). The motor of the shredder is stopped. Repeated counterclockwise rotation of the rotary knob 11 to position d and release of the rotary knob 11 to position a puts the motor in reverse point-action state until the blockage is released.

Claims

1. A switch mechanism for a tool or machine comprising:

   a magnetic switch having a first button and a second button;
   a lever switch having a lever button;
   a faceplate mountable on a part of the tool or machine;
   a rotary knob mounted on the faceplate so as to be selectively positionable by rotation at a first position, a second position, a third position and a fourth position relative to the faceplate; and
   a trigger assembly connected or coupled to the rotary knob, wherein the trigger assembly

      (1) triggers the first button when the rotary knob is positioned at the first position;
      (2) triggers the second button when the rotary knob is positioned at the second position;
      (3) at least partially releases the second button when the rotary knob is positioned at the third position; and
      (4) triggers the second button and the lever button simultaneously when the rotary knob is positioned at the fourth position.

2. A switch mechanism as claimed in claim 1 wherein when the rotary knob is positioned at the third position, the trigger assembly partially releases the second button and partially depresses the first button.

3. A switch mechanism as claimed in claim 1 wherein the first button is a stopping button and the second button is an operating button.

4. A switch mechanism as claimed in any preceding claim further comprising:

   a sliding member attached or coupled to the rotary knob,

   wherein the faceplate defines a first sliding slot and the sliding member is slidable in the first sliding slot between a first delimiting position and a second delimiting position, wherein the trigger assembly triggers the second button when the sliding member is located at the first delimiting position in the first sliding slot and the trigger assembly at least partially releases the second button of the magnetic switch when the sliding member is located at the second delimiting position in the first sliding slot.

5. A switch mechanism as claimed in claim 4 wherein the sliding member is a push rod projecting beyond a bottom surface of the rotary knob.

6. A switch mechanism as claimed in claim 4 or 5 wherein the rotary knob defines a longitudinal socket and a resilient member in the longitudinal socket couples a base of the longitudinal socket with the sliding member to leave the sliding member partly exposed from the longitudinal socket.

7. A switch mechanism as claimed in claim 4, 5 or 6 wherein the faceplate further defines a second sliding slot and the sliding member is slidable in the second sliding slot between a first delimiting position and a second delimiting position, wherein the trigger assembly triggers the first button of the magnetic switch when the sliding member is located at the first delimiting position of the second sliding slot and the trigger assembly triggers the second button of the magnetic switch and the lever button of the lever switch simultaneously when the sliding member is located at the second delimiting position in the second sliding slot.

8. A switch mechanism as claimed in any preceding claim wherein the trigger assembly includes:

   a multi-lobal trigger body connected or coupled to the rotary knob; and
   a reciprocal positioning cradle adjacent to and engageable with the trigger body.

9. A switch mechanism as claimed in claim 8 wherein the trigger body includes:

   a substantially cylindrical shaft;
   a cam lobe extending rotationally outwardly from the shaft which is rotationally engageable with the first button of the magnetic switch to partially depress or trigger the first button,
   a first pushing lobe extending rotationally outwardly from the shaft which is rotationally engageable with the lever button of the lever switch to trigger the lever button and with the positioning cradle to trigger the second button of the magnetic switch,
   a second pushing lobe extending rotationally outwardly from the shaft which is rotationally engageable with the positioning cradle to trigger the second button of the magnetic switch; and
   a third pushing lobe extending rotationally out-

wardly from the shaft which is rotationally engageable with the positioning cradle to trigger the second button of the magnetic switch.

10. A switch mechanism as claimed in claim 9 wherein the third pushing lobe is a pair of pushing lobes axially spaced apart along the shaft in a substantially common radial direction.

11. A switch mechanism as claimed in claim 9 or 10 wherein the first pushing lobe and the second pushing lobe extend radially outwardly in a substantially common plane.

12. A switch mechanism as claimed in any preceding claim wherein the reciprocal positioning cradle includes a reciprocal base capable of reciprocally biassing the second button of the magnetic switch and a pair of laterally spaced apart runners extending rearwardly from an interior face of the reciprocal base, wherein each runner defines a positioning slot, wherein the reciprocal base defines a socket to receive the first button of the magnetic switch.

13. A switch mechanism as claimed in claim 12 wherein at least one of the pair of runners includes a pair of substantially parallel vertically spaced apart latching slots which communicate with the positioning slot, wherein the switch mechanism further comprises:

a substantially C-shaped latch mounted vertically with its arms in the pair of latching slots and slidable in the latching slots along the positioning slot, wherein a cylindrical finger extends from a base of the C-shaped latch and a first resilient biassing member is attached to a tip of the cylindrical finger, wherein the second pushing lobe is rotationally engageable with and drives the C-shaped latch into engagement with the reciprocal base to reciprocally bias the second button of the magnetic switch.

14. A switch mechanism as claimed in any preceding claim further comprising:

an elongate switch housing, wherein the magnetic switch and the lever switch are mounted in and at opposite ends of the housing and the trigger assembly is mounted therebetween.

15. A switch mechanism as claimed in any preceding claim
wherein when the trigger assembly triggers the first button when the rotary knob is positioned at the first position, the tool or machine is non-operational.

16. A switch mechanism as claimed in any preceding claim
wherein when the trigger assembly triggers the second button when the rotary knob is positioned at the second position, the tool or machine is operational.

17. A switch mechanism as claimed in any preceding claim
wherein when the trigger assembly at least partially releases the second button when the rotary knob is positioned at the third position, the tool or machine is operational.

18. A switch mechanism as claimed in any preceding claim
wherein when the trigger assembly triggers the second button and the lever button simultaneously when the rotary knob is positioned at the fourth position, the tool or machine is in reverse operation.

19. A switch mechanism as claimed in any preceding claim
wherein the lever button is capable of causing the tool or machine to reverse rotate.

20. A switch assembly, including a magnetic switch and a lever switch, the magnetic switch having a first button and a second button, the lever switch having a lever button, **characterized in that**: the switch assembly further including a faceplate, a knob mounted on the faceplate, a trigger group and a break protection member, the knob being locatable at a first position, a second position, a third position and a fourth position on the faceplate, the trigger group being connected to the knob and selectively trigging the first button and the second button of the magnetic switch and the lever button of the lever switch, the break protection member being mounted between the faceplate and the knob, the trigger group trigging the first button of the magnetic switch when the knob locates at the first position; the trigging group trigging the second button of the magnetic switch when the knob locates at the second position; the trigger group releasing the second button of the magnetic switch when the knob locates at the third position, and the trigging group trigging the second button of the magnetic switch and the lever button of the lever switch at the same time when the knob locates at the fourth position.

21. A switch assembly, including a magnetic switch having a button, **characterized in that**: the switch assembly further comprising a faceplate, a knob mounted on the faceplate, a trigger group and a break protection member, the knob being locatable at two different positions of the faceplate, the trigger group being attached to the knob and being able to trigger the button of the magnetic switch, the trigger group fully triggering the button of the magnetic switch when the knob is located at one of the two

positions on the faceplate; the break protection member being arranged between the faceplate and the knob, and making the button of magnetic switch be in a releasing state when the knob is located at another one of two positions on the faceplate.

22. A shredder comprising a switch mechanism as defined in any preceding claim.

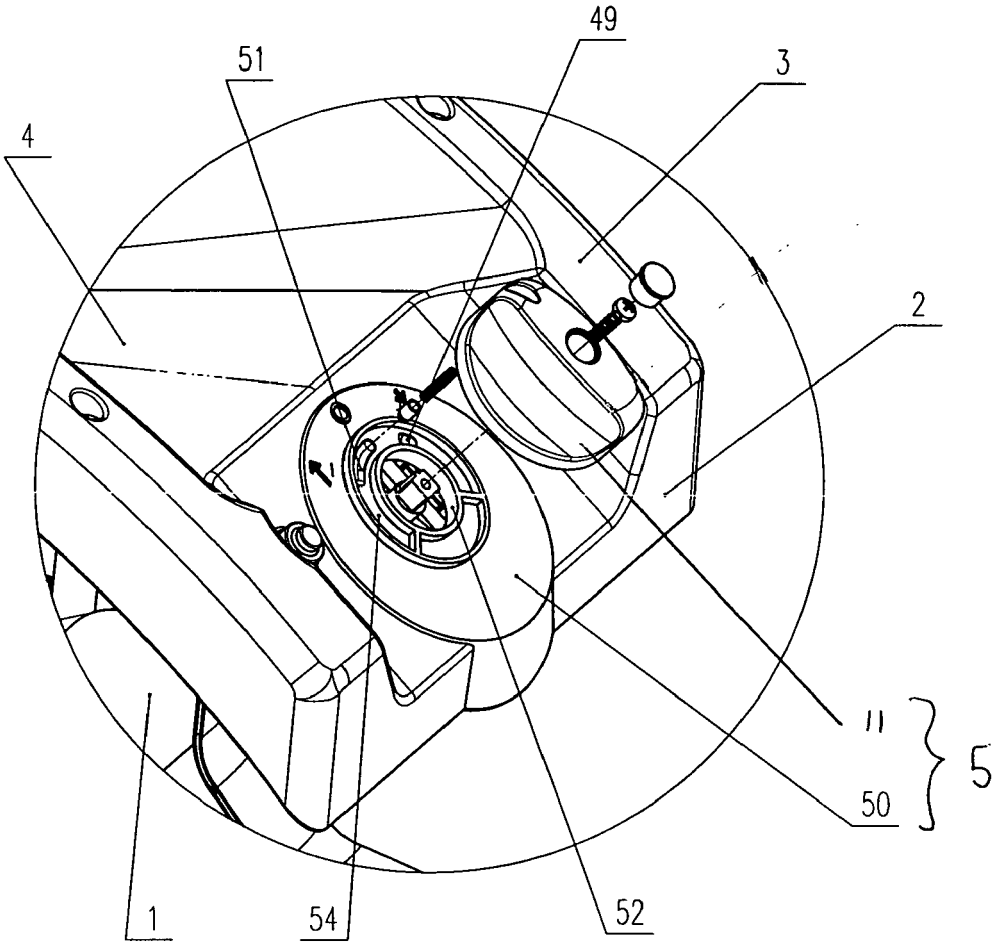

Fig.1

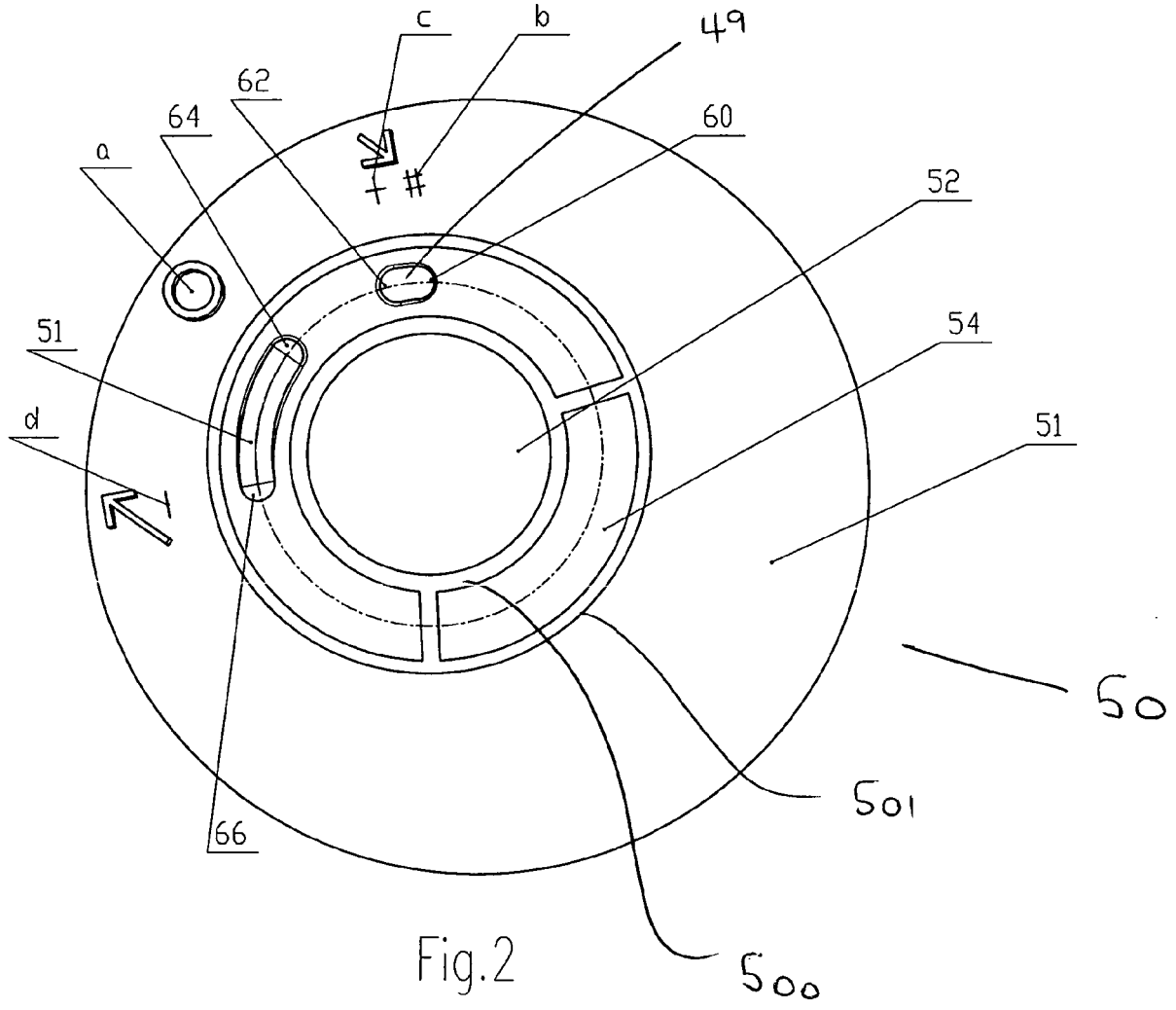

Fig.2

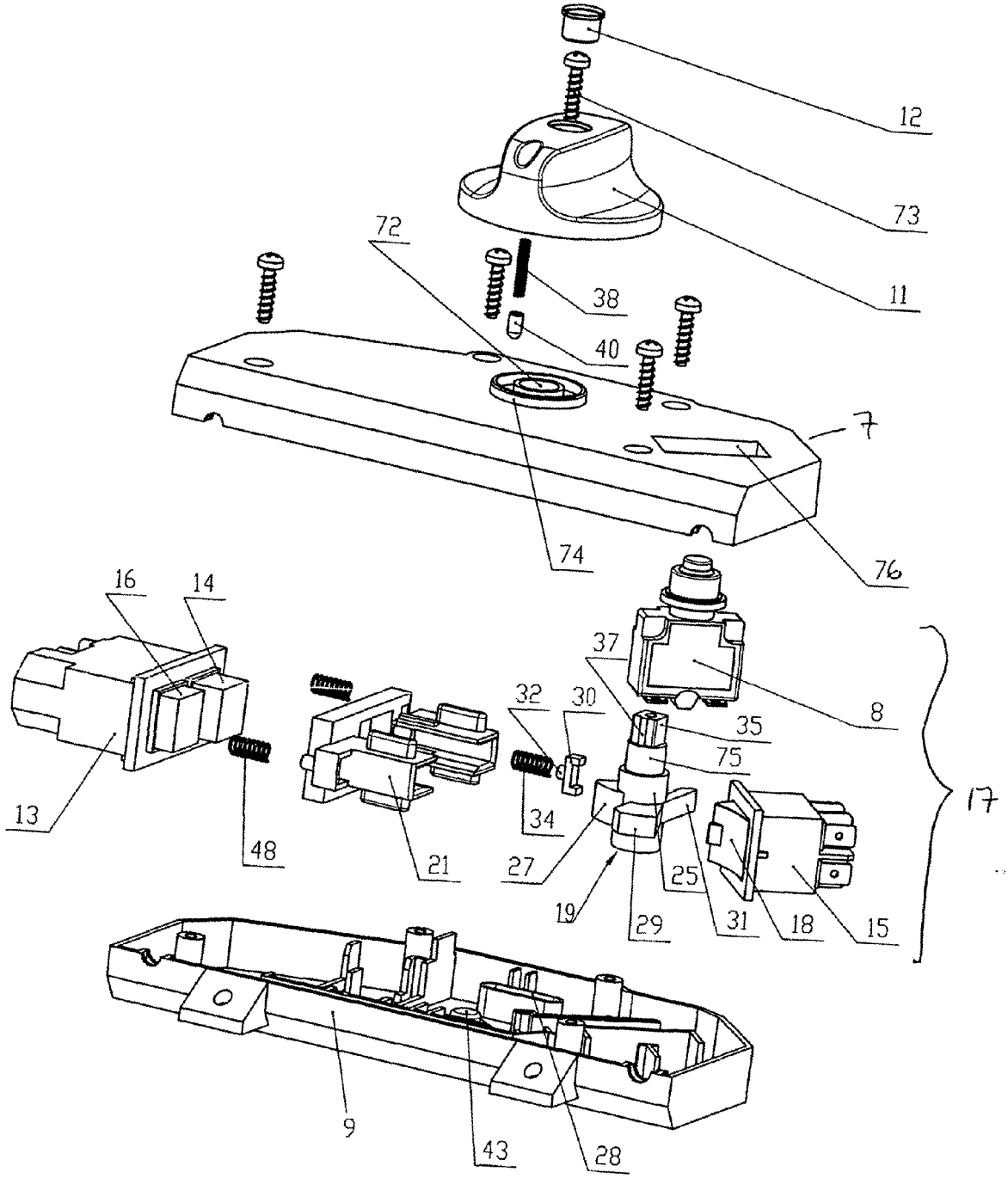
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Fig.3

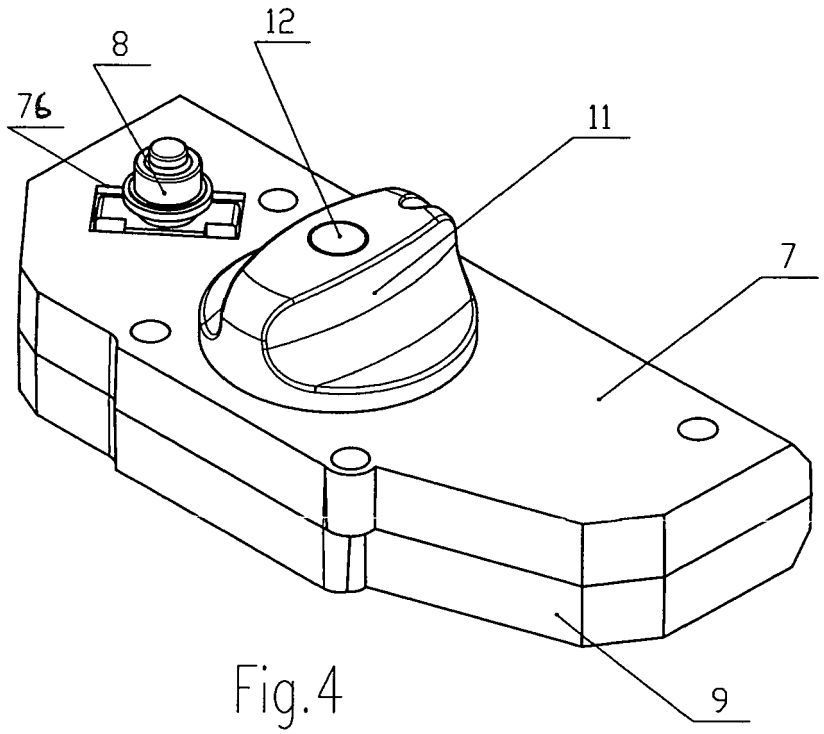

Fig.4

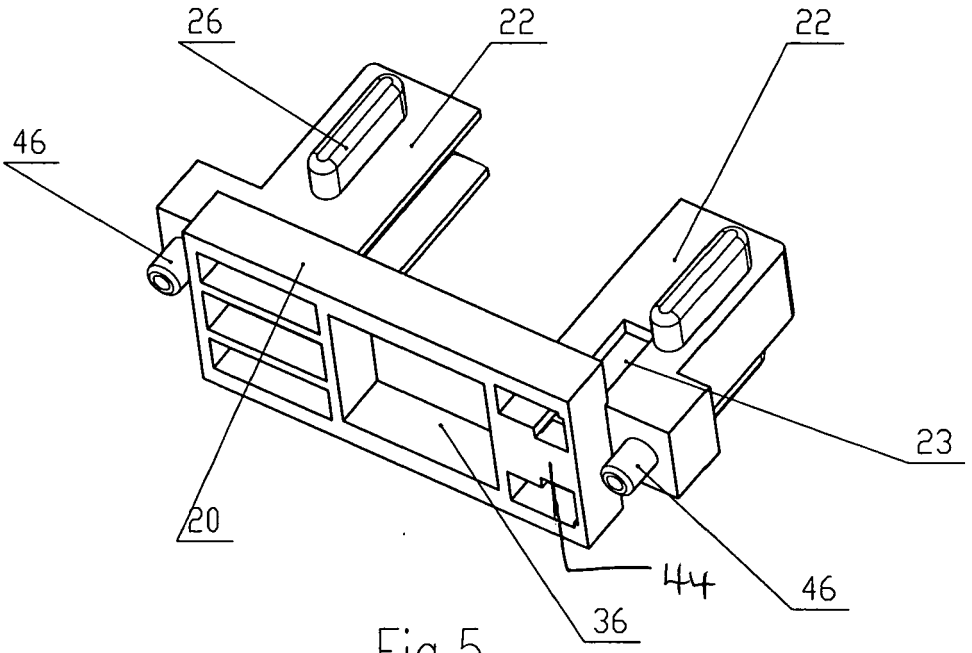

Fig.5

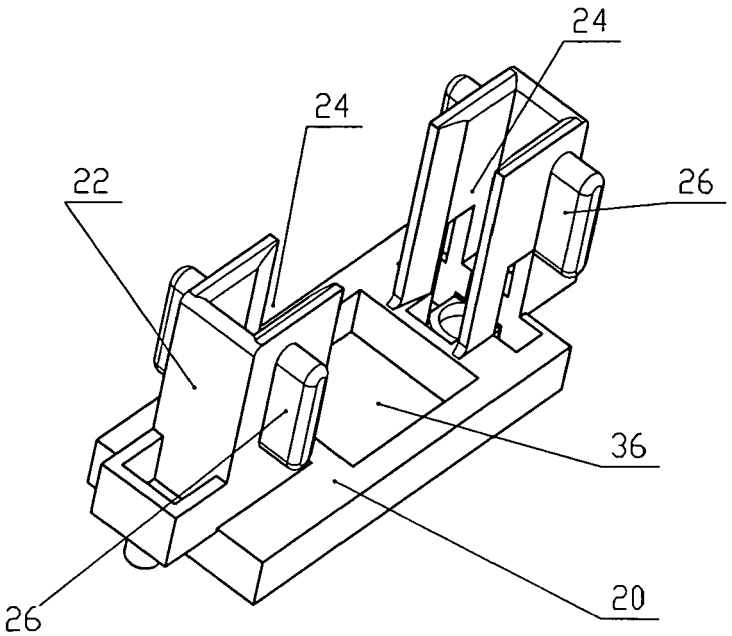

Fig.6

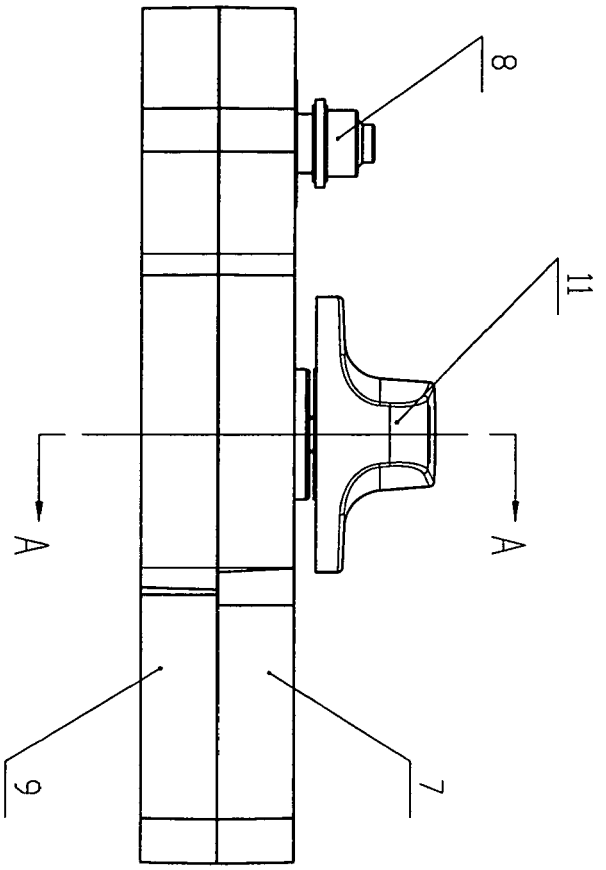

Fig.7

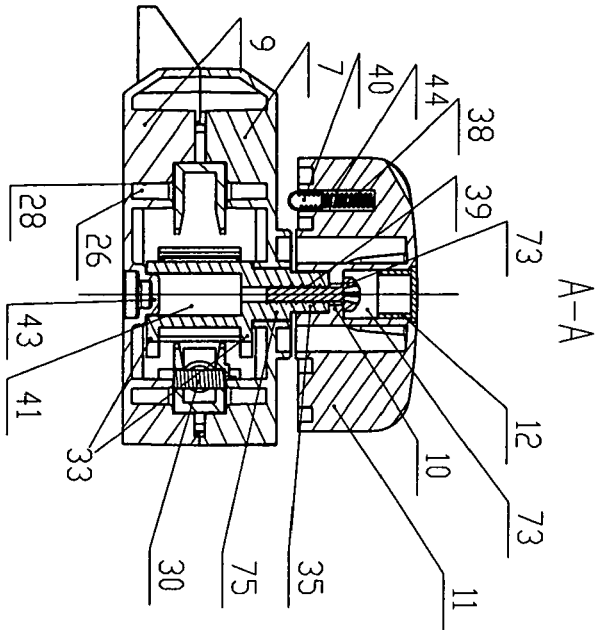

Fig.8

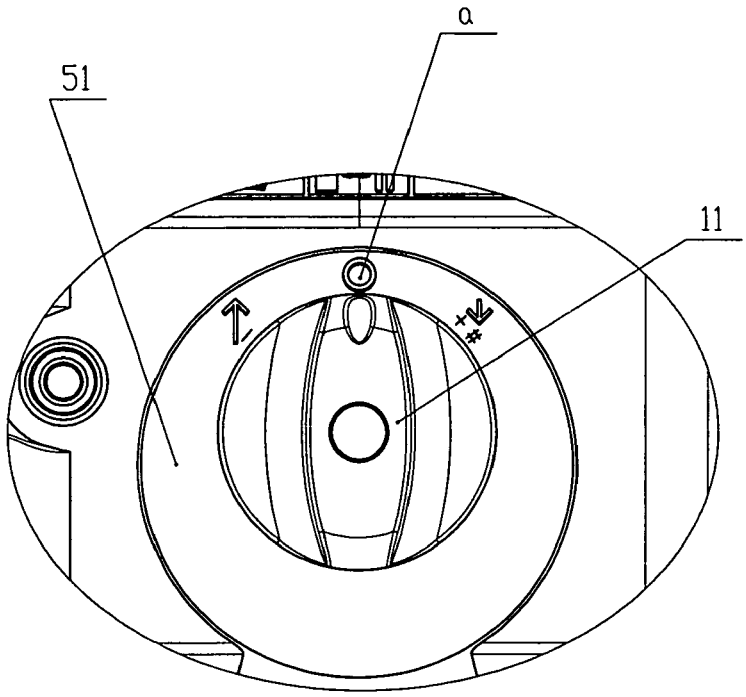

Fig.9

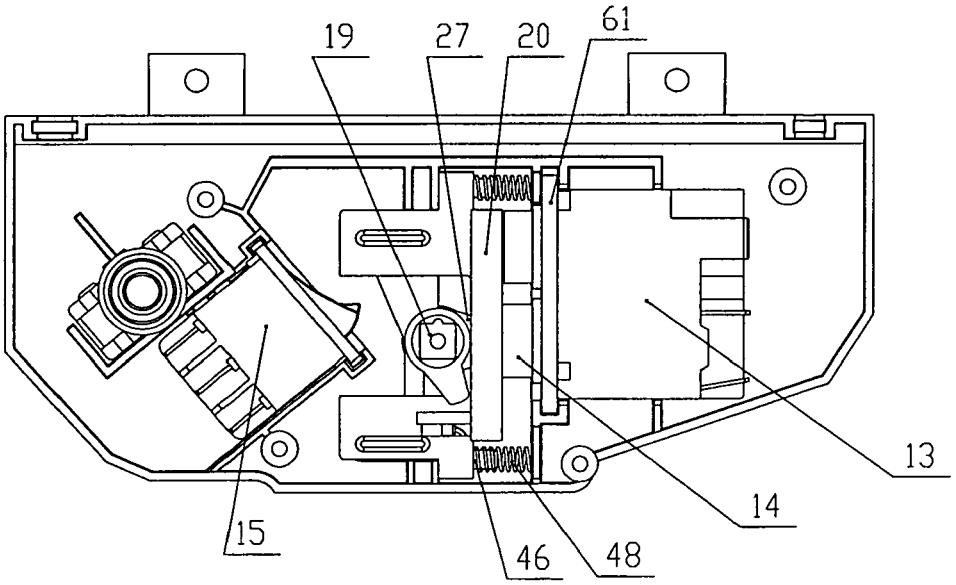

Fig.10

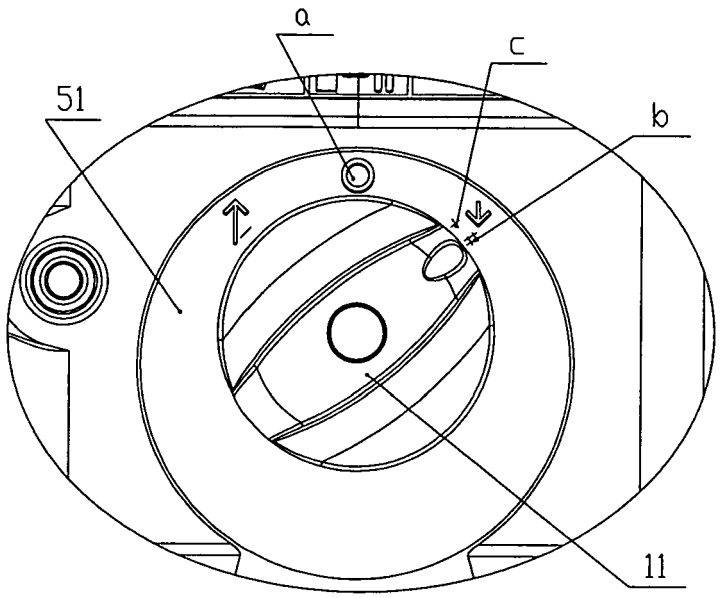

Fig.11

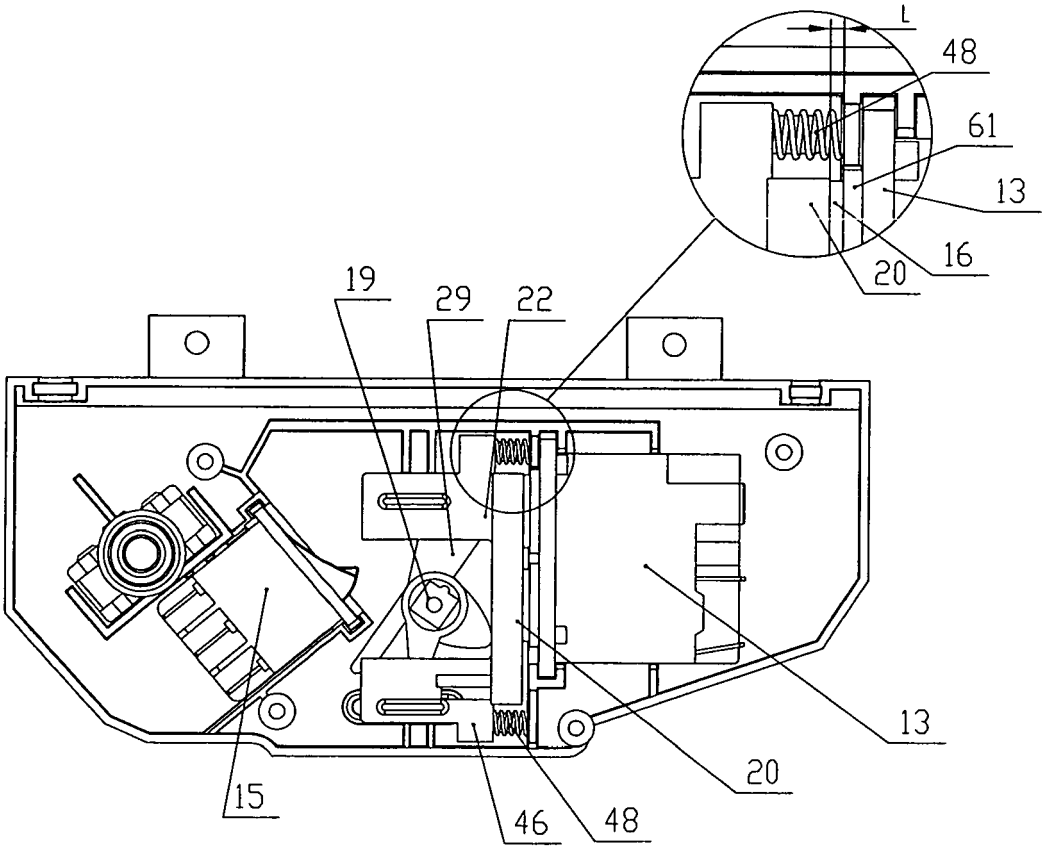

Fig.12

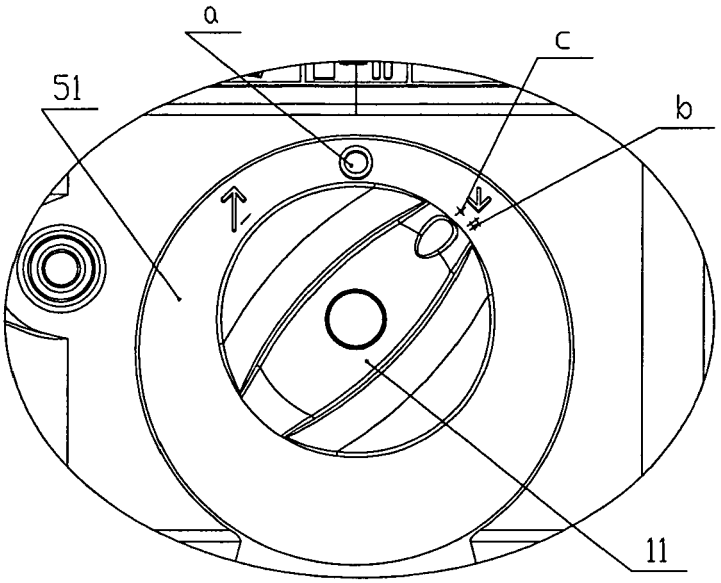

Fig.13

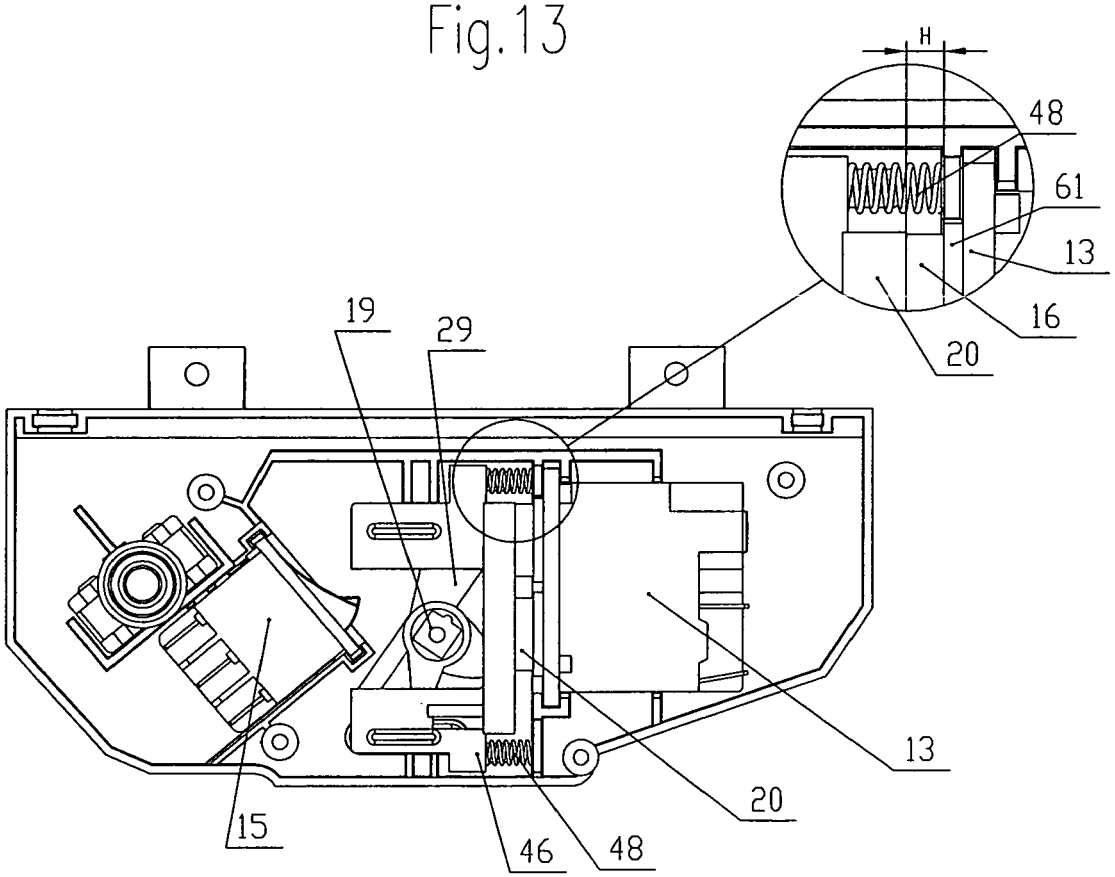

Fig.14

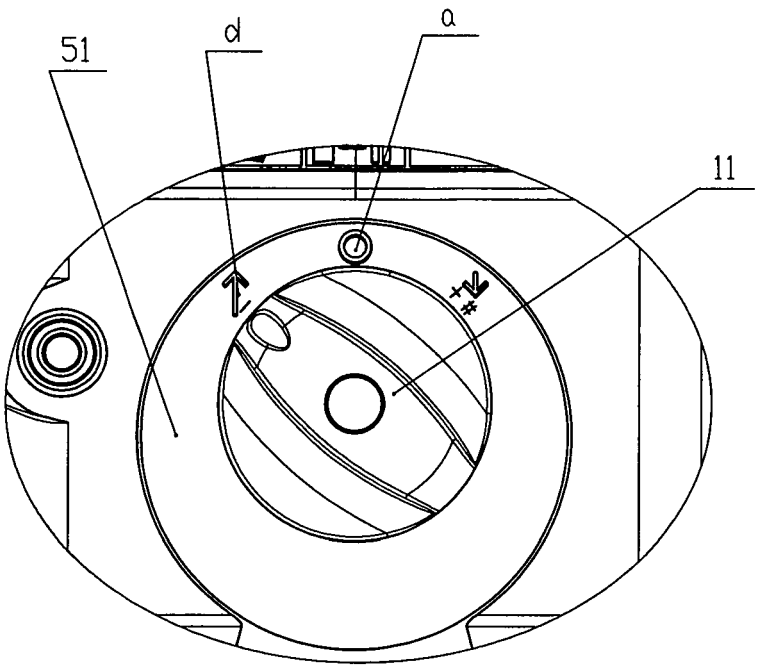

Fig.15

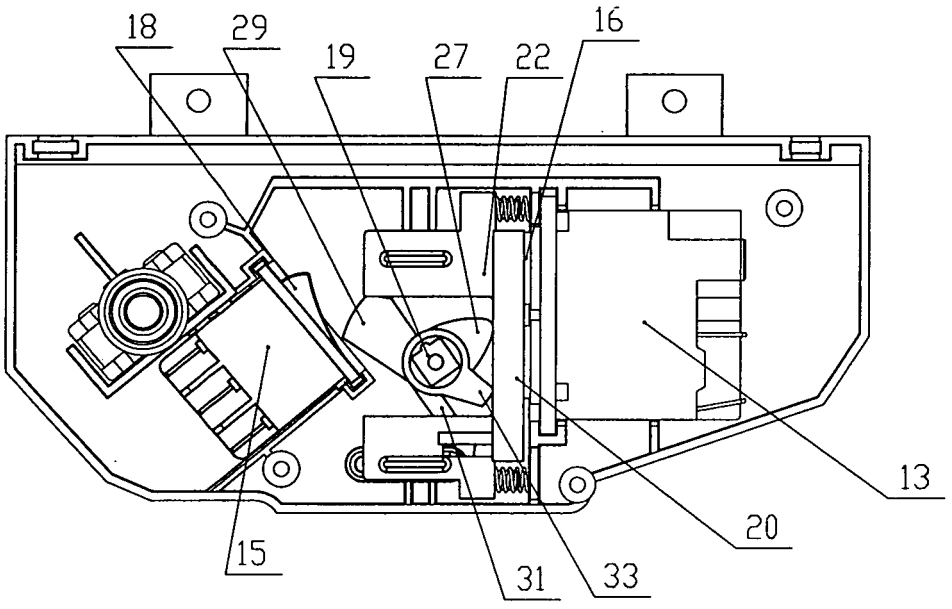

Fig.16

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EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	21 August 2007	Drabko, Jacek

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