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(54) **AIR COMPRESSOR CONSTRUCTION**

KONSTRUKTION EINES LUFTKOMPRESSORS

STRUCTURE DE COMPRESSEUR D'AIR

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(56) References cited:
CN-A- 101 240 784
CN-A- 101 429 935
CN-C- 100 432 433
CN-Y- 2 369 008
US-A- 5 655 887
US-A- 5 655 887
US-A1- 2005 191 193

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Description

(a) Technical Field of the Invention

[0001] The present invention relates to an air compressor and, more particularly, to an air compressor that includes a piston body defining an air receiving space to allow the compressed air produced in the cylinder to keep under a safety pressure, without requiring the air compressor to install a safety valve, thereby reducing the manufacturing cost.

(b) Description of the Prior Art

[0002] From document US 5,655,887 A a conventional air compressor structure is known which serves for achievement of a high compression ratio. The air compressor structure includes a piston body, wherein the piston body comprises a head structure and a rod, wherein the head structure defines a plurality of axial air holes.

[0003] Air compressors are usually employed to inflate objects. They are widely applied in inflating air cushions and tires. Some air compressors are manufactured in small size, so that they can be carried easily. Furthermore, they can be powered by a handheld DC power supply or a cigarette lighter socket in a vehicle, so that they can be operated conveniently and easily. In a conventional air compressor, a motor is employed to drive a piston body to conduct reciprocating motion in a cylinder to produce compressed air, which can be transferred into an air storage container. One outlet of the air storage container can be connected to an object by a hose for inflation. In a conventional air compressor, the head of the piston body is a solid structure, and an automatically acting safety valve is installed so that, when the pressure of the compressed air produced in the cylinder exceeds the safety pressure of an object being inflated, the safety valve can release some compressed air into the environment to ensure the safety of the air compressor and the object being inflated. However, the safety valve installed on the air compressor increases the manufacturing cost of the air compressor.

[0004] In view of the foregoing, the additional safety valve, which is indispensible and has to be installed on an air compressor for limiting the output air pressure, increases the manufacturing cost. For solving the disadvantage, the applicant has carefully investigated the operations of conventional air compressors and thus designed an air compressor that can achieve the effect of limiting air pressure without requiring the air compressor to install a safety valve.

SUMMARY OF THE INVENTION

[0005] The present invention provides an air compressor according to claim 1 that can protect an object from being overly inflated, without requiring the air compressor to install a safety valve.

[0006] The air compressor of the present invention sought to find a solution to a disadvantage of conventional air compressors.

[0007] The air compressor includes a box and a compressor unit installed in the box. The compressor unit includes a piston body driven by a motor to conduct reciprocating motion in a cylinder. The piston body has a head defining an intake channel therethrough and defining an air receiving space.

[0008] According one feature of the present invention, the piston body has a rod in addition to the head. The head of the piston body defines the air receiving space which extends downwardly from a top opening at the top of the head and is bounded by a bottom surface and a surrounding surface. The intake channel extends downwardly from the bottom surface of the air receiving space and communicates with the air receiving space. The bottom surface of the air receiving space is provided with a mounting post. A resilient sheet is mounted on the mounting post provided on the bottom surface of the air receiving space.

[0009] According to another feature of the present invention, the head of the piston body forms a flat top flange at the periphery of the top opening of the air receiving space, and forms a bottom flange below the top flange, and defines an annular groove at its outer surface, between the top flange and the bottom flange, wherein the annular groove does not communicate with the air receiving space. The bottom flange of the head of the piston body is joined to a first end of the rod of the piston body. A second end of the piston body defines a pivot hole. An air-tight ring, which functions as an O-ring, is fitted into the annular groove of the head of the piston body.

[0010] According to one alternative feature of the present invention, the intake channel extends downwardly from the top flange. The air receiving space extends downwardly from the top flange and does not communicate with the intake channel. Amounting post is provided on the top flange. A resilient sheet is mounted on the mounting post provided on the top flange, capable of closing the intake channel.

[0011] According to a further feature of the present invention, the cylinder has a top wall at its top, which defines an exit hole communicating with an air storage container on the cylinder. The air storage container is provided with a plurality of outlets, one of which is connected with a hose, one of which is connected with a pressure gauge, and one of which is connected with a relief valve that includes a soft cap at its innermost end. A plug is provided in the air storage container, on the exit hole, wherein the top of the plug is urged by a compression spring.

[0012] According to a still further feature of the present invention, the hose connected to one of the outlets of the air storage container is able to be accommodated in the box and closed by a lid.

[0013] According to a yet still further feature of the present invention, the box is provided with a switch for starting or stopping the compressor unit. The pressure

gauge is exposed to outside of the box. A push bar of a button is inserted through a bolt to touch the soft cap of the relief valve connected to the compressor unit.

[0014] According to a yet still further feature of the present invention, when the piston body which conducts reciprocating motion in the cylinder is at top dead center, a space is existed between the top wall of the cylinder and the head of the piston body.

[0015] In the compressor unit of the present invention, since the head of the piston body defines the intake channel and the air receiving space, the pressure of the compressed air produced from the reciprocating motion in the cylinder will not exceed the safety pressure of an object to be inflated. As such, the compressor unit can limit the pressure of the compressed air being transferred into the object to be inflated, without requiring the compressor unit to install a safety valve. This can reduce the manufacturing cost of the compressor unit to achieve economic benefits, and increases the operational safety.

[0016] In another embodiment of the compressor unit of the present invention, when the piston body which conducts reciprocating motion in the cylinder reaches top dead center, a space is existed between the top wall of the cylinder and the head of the piston body, so that the piston body can conduct reciprocating motion even more smoothly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017]

FIG. 1 shows a 3-dimensional view of an air compressor, including a box and a compressor unit, of the present invention, wherein the compressor unit is installed in the box.

FIG. 2 shows a plan view of the air compressor.

FIG. 3 shows a 3-dimensional view of the compressor unit.

FIG. 4 shows an exploded view of a first embodiment of a piston body used in the compressor unit.

FIG. 5 shows a 3-dimensionally sectional view of the first embodiment of the piston body.

FIG. 6 shows a schematically sectional view of the air compressor, wherein the piston body is conducting a downward stroke, whereby outside air can be pulled into the interior of the cylinder.

FIG. 7 shows a schematically sectional view of the air compressor, wherein the piston body has conducted an upward stroke, whereby the air contained in the cylinder can be compressed in the cylinder to produce compressed air.

FIG. 8 shows a schematically sectional view of the compressor unit, which is viewed from another angle, wherein the piston body has conducted an upward stroke.

FIG. 9 shows a schematically sectional view of another embodiment of the compressor unit.

FIG. 10 shows another sectional view of the compressor unit.

FIG. 11 shows an exploded view of a second embodiment of the piston body used in the compressor unit.

FIG. 12 shows a 3-dimensional view of the second embodiment of the piston body.

FIG. 13 shows a schematically sectional view of the air compressor employing the second embodiment of the piston body, wherein the piston body is conducting a downward stroke, whereby outside air can be pulled into the interior of the cylinder.

FIG. 14 shows a schematically sectional view of the air compressor employing the second embodiment of the piston body, wherein the piston body has conducted an upward stroke, whereby the air contained in the cylinder can be compressed in the cylinder to produce compressed air.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] For further disclosing the technical contents of the present invention, various embodiments are provided in the following paragraphs.

[0019] Referring first to FIGS. 1, 3 and 6, an air compressor according to one embodiment of the present invention is shown, which generally includes a box 1 and a compressor unit (see FIG. 3) installed in the box 1. The compressor unit includes a cylinder 3, which allows a piston body 6 to operate therein, and a main frame 20 for mounting a motor 21. The main frame 20 also mounts a transmission mechanism, which includes a pinion 22, and a gear 23. The crankpin 24 attached to the gear 23 is pivotally connected with the piston body 6. The motor 21 can drive the transmission mechanism to have the piston body 6 conduct reciprocating motion along the inner surface 34 of the cylinder 3 to produce compressed air, which can push a plug 44 up and compress a compression spring 46 on the plug 44 to allow the compressed air to flow into an air storage container 4. One primary feature of the present invention is that the piston body 6 has a head 61 which defines an intake channel 604 extending therethrough, and an air receiving space 60, so that the pressure of the compressed air produced from the reciprocating motion in the cylinder 3 will not exceed the safety pressure of an object to be inflated, so that the compressor unit does not require installation of a safety valve. Therefore, a user can use the compressor unit to inflate an object more conveniently, and the object can be protected from over-inflation.

[0020] Referring next to FIGS. 4 and 5, the piston body 6 has a rod 62 in addition to the head 61. The head 61 of the piston body 6 defines the air receiving space 60, which extends downwardly from a top opening 601 at the top of the head 61 and is bounded by a bottom surface 602 and a surrounding surface 603. The intake channel 604 extends downwardly from the bottom surface 602 of the air receiving space 60. The bottom surface 602 of

the air receiving space 60 is provided with a mounting post 605. The head 61 of the piston body 6 forms a flat top flange 611 at the periphery of the top opening 601 of the air receiving space 60, and forms a flat bottom flange 612 below the top flange 611. The head 61 of the piston body 6 defines an annular groove 64 at its outer surface, between the top flange 611 and the bottom flange 612, wherein the annular groove 64 does not communicate with the air receiving space 60. The bottom flange 612 of the head 61 is joined to a first end 621 of the rod 62 which has a predetermined length. The lower end, i.e. the second end 622, of the rod 62 defines a pivot hole 63. An air-tight ring 65, which functions as an O-ring, is fitted into the annular groove 64 of the head 61 of the piston body 6. A resilient sheet 66 is mounted on the mounting post 605 provided on the bottom surface 602 of the air receiving space 60.

[0021] The operation of the compressor unit of the present invention can be referred to FIGS. 3, and 6 through 8, wherein the cylinder 3 has a top wall 32 which serves as a top border of an inner space 31 of the cylinder 3. The top wall 32 defines an exit hole 33, which can communicate with the air storage container 4 on the cylinder 3. The air storage container 4 is provided with a plurality of outlets 41, 42, 43 (see also FIG. 10 for the outlet 43), wherein the outlet 41 can be connected with a hose 14; the outlet 42 can be connected with a pressure gauge 12; the outlet 43 can be connected with a relief valve 5, which is provided with a soft cap 51 at its inmost end. The plug 44 is provided in the air storage container 4, on the exit hole 33, wherein the top of the plug 44 is urged by the compression spring 46. The entire compressor unit is installed in the box 1, wherein the box 1 (see FIG. 1) is provided with a switch 11 for starting or stopping the compressor unit; the pressure gauge 12 is exposed to outside of the box 1; a button 13 has a push bar 131 inserted through a bolt 52 fitted onto the outlet 43 to touch the soft cap 51 of the relief valve 5. During an inflating operation, in case an object is noticed to have a higher pressure, a user may depress the button 13 to press the soft cap 51 of the relief valve 5, so that the soft cap 51 can be deformed to allow excessive air to release from the outlet 43 where the relief valve 5 is installed. The hose 14 connected to the outlet 41 can be accommodated in the box 1, and can be closed by a lid 15 (see FIG. 2) to have an aesthetic appearance.

[0022] The piston body 6 of the compressor unit can conduct reciprocating motion in the cylinder 3. When the piston body 6 conduct an upward stroke, the air contained in the inner space 31 can be forced to flow into the inner space 45 of the air storage container 4, and then can flow into an object to be inflated by way of the hose 14 connected with the outlet 41. When the piston body 6 conducts a downward stroke, the resilient sheet 66 can be pushed up, and outside air can be pulled into the inner space 31 of the cylinder 3 by way of the intake channel 604. As such, repetitive upward and downward strokes will make the object fully inflated. FIGS. 6 and 7 show the operational states of the piston body 6 that conduct reciprocating motion in the cylinder 3. When the piston body 6 has conducted an upward stroke to reach top dead center, although the top flange 611 of the piston body 6 contacts the top wall 32 of the cylinder 6, the air receiving space 60 of the head 61, which can store additional compressed air, allows the motion resistance of the piston body 6 to be reduced, so that the piston body 6 can conduct reciprocating motion more smoothly. As such, the pressure in an object to be inflated will keep less than a safety pressure of the object, so that the inflating operation can be conducted more safely. Alternatively, FIG. 9 shows another embodiment of the compressor unit, wherein when the piston body 6 reaches top dead center, a space 31 is existed between the top of the head 61 of the piston body 6 and the top wall 32 of the cylinder 32, and this allows the piston body 3 to conduct reciprocating motion even more smoothly.

[0023] FIGS. 11 and 12 show a second embodiment of the piston body used in the present invention, wherein the piston body 7 has a head 71 and a rod 72. The head 71 forms a flat top flange 711 at its top and defines an intake channel 702 extending downwardly from the top flange 711. A mounting post 713 is formed on the top flange 711. The head 71 also defines an air receiving space 70 which extends downwardly from a top opening 701 at the top flange 711 and does not communicate with the intake channel 702. The head 71 forms a bottom flange 712 below the top flange 712. The head 71 defines at its outer surface, between the top flange 711 and the bottom flange 712, an annular groove 74, which does not communicate with the air receiving space 70. The bottom flange 712 of the head 71 is joined to a first end 721 of the rod 72 which has a predetermined length. The other end, i.e. the second end 722, of the rod 72 defines a pivot hole 73. An air-tight ring 75, which functions as an O-ring, is fitted into the annular groove 74 of the head 71. A resilient sheet 76 is mounted on the mounting post 713 provided on the top flange 711 of the head 71. FIGS. 13 and 14 show the operational states of the piston body 7 that conducts reciprocating motion in the cylinder 3. When the piston body 7 has conducted an upward stroke to reach top dead center, although the top flange 711 of the head 71 contacts the top wall 32 of the cylinder 3, the air receiving space 70 can store additional compressed air, so that the motion resistance of the piston body 7 can be reduced, and thus the piston body 7 can conduct reciprocating motion more smoothly. As such, the pressure in an inflated object to be inflated will keep less than a safety pressure of the object, so that the inflating operation can be conducted more safely. Besides, a safety valve, which is usually installed on an air compressor, can be saved.

[0024] In light of the foregoing, the head 61 of the piston body 6 defines an air receiving space 60, which can limit the air pressure of the compressed air being transferred to an object without requiring the compressor unit to install a safety valve.

Claims

1. An air compressor including a box (1) and a compressor unit installed in the box (1), wherein the compressor unit includes a piston body (6)(7) driven by a motor (21) to conduct reciprocating motion in a cylinder (3), wherein the piston body (6)(7) comprises a head (61)(71) and a rod (62)(72), wherein the head (61)(71) defines an intake channel (604)(702) therethrough and defines an air receiving space (60)(70) therein, wherein the head (61)(71) of the piston body (6)(7) forms a flat top flange (611) (711) at its top and forms a bottom flange (612) (712) below the top flange (611) (711), wherein the bottom flange (612) (712) of the head (6)(7) is joined to a first end (621)(721) of the rod (62)(72), **characterized in that** a single intake channel (604) (702) is provided on the head (61)(71), and
the air receiving space (60)(70) is formed as cavity for storing additional compressed air, wherein said cavity is bounded by a bottom surface (602) and a surrounding surface (603) and is open at a top opening (601) (701) formed at the top of the head (61)(71), wherein the bottom surface (602) is defined in the head (61)(71) at a depth close to the bottom flange (612)(712) of the head (61)(71), such that the air receiving space (60)(70) extending downwardly from the top opening (601) (701) to the bottom surface (602) has a depth nearly corresponding to a distance between the flat top flange (611) (711) and the bottom flange (612) (712).

2. The air compressor of claim 1, further **characterized in that**: the intake channel (604) extends downwardly from the bottom surface (602) of the air receiving space (60) and communicating with the air receiving space (60), the bottom surface (602) of the air receiving space (60) being provided with a mounting post (605); a resilient sheet (66) is mounted on the mounting post (605) provided on the bottom surface (602) of the air receiving space (60).

3. The air compressor of claim 1, further **characterized in that**: the head (61) defines an annular groove (64) at its outer surface, between the top flange (611) and the bottom flange (612), the annular groove (64) not communicating with the air receiving space (60), , and a second end (622) of the piston body (6) defining a pivot hole (63); an air-tight ring (65), which functions as an O-ring, is fitted into the annular groove (64) of the head (61) of the piston body (6).

4. The air compressor of claim 1, further **characterized in that**:, the intake channel (702) extending downwardly from the top flange (711); the air receiving space (70) extending downwardly from the top flange (711) and not communicating with the intake channel (702); a mounting post (713) is provided on the top flange (711), a resilient sheet (76) being mounted on the mounting post (713) provided on the top flange (711) capable of closing the intake channel (702).

5. The air compressor of claim 1, further **characterized in that**: the cylinder (3) has a top wall (32) at its top, the top wall (32) of the cylinder (3) defining an exit hole (33) communicating with an air storage container (4) on the cylinder (3), the air storage container (4) being provided with a plurality of outlets (41, 42, 43), one of which is connected with a hose, one of which is connected with a pressure gauge, and one of which is connected with a relief valve (5) that includes a soft cap (51) at its innermost end; a plug (44) is provided in the air storage container (4), on the exit hole (33), the top of the plug (44) being urged by a compression spring (46).

6. The air compressor of claim 5, further **characterized in that**: the hose (14) connected to one of the outlets of the air storage container (4) is able to be accommodated in the box (1) and closed by a lid (15).

7. The air compressor of claim 1, further **characterized in that**: the box (1) is provided with a switch (11) for starting or stopping the compressor unit, the pressure gauge (12) being exposed to outside of the box (1), a push bar (131) of a button (13) being inserted through a bolt (52) to touch a soft cap (51) of a relief valve (5) connected to the compressor unit.

8. The air compressor of claim 1, further **characterized in that**: when the piston body (7) which conducts reciprocating motion in the cylinder (3) is at top dead center, a space is existed between a top wall (32) of the cylinder (3) and the head (61) of the piston body (6).

Patentansprüche

1. Luftkompressor, der ein Gehäuse (1) und eine Kompressoreinheit umfasst, die in dem Gehäuse (1) installiert ist, wobei die Kompressoreinheit einen Kolbenkörper (6)(7) umfasst, der von einem Motor (21) angetrieben wird, um Pendelbewegungen in einem Zylinder (3) durchzuführen, wobei der Kolbenkörper (6)(7) einen Kopf (61)(71) und eine Stange (62)(72) umfasst, wobei der Kopf (61)(71) einen Einlasskanal (604)(702) dadurch definiert und einen Luftaufnahmeraum (60)(70) darin definiert, wobei der Kopf:(61)(71) des Kolbenkörpers (6)(7) einen flachen oberen Flansch (611)(711) an seiner Oberseite ausbildet und einen unteren Flansch (612)(712) unter dem oberen Flansch (611)(711) ausbildet, wobei der untere Flansch (612)(712) des Kopfes (6)(7) mit einem ersten Ende (621)(721) der Stange (62)(72) verbunden ist, **dadurch gekennzeichnet, dass** ein

einzelner Einlasskanal (604)(702) an dem Kopf (61)(71) bereitgestellt ist, und der Luftaufnahmeraum (60)(70) als eine Kavität ausgebildet ist, um zusätzliche Druckluft zu speichern, wobei die Kavität von einer unteren Fläche (602) und einer umgebenden Fläche (603) beschränkt wird und an einer oberen Öffnung (601)(701), die an der Oberseite des Kopfes (61)(71) ausgebildet ist, offen ist, wobei die untere Fläche (602) in dem Kopf (61)(71) definiert ist, und zwar in einer Tiefe nahe dem unteren Flansch (612)(712) des Kopfes (61)(71), so dass der Luftaufnahmeraum (60)(70), der sich von der oberen Öffnung (601)(701) zu der unteren Fläche (602) erstreckt, eine Tiefe aufweist, die einer Distanz zwischen dem flachen oberen Flansch (611)(711) und dem unteren Flansch (612)(712) annähernd entspricht.

2. Luftkompressor nach Anspruch 1, ferner **dadurch gekennzeichnet, dass** der Einlasskanal (604) sich von der unteren Fläche (602) des Luftaufnahmeraums (60) nach unten erstreckt und mit dem Luftaufnahmeraum (60) in Verbindung steht, wobei die untere Fläche (602) des Luftaufnahmeraums (60) mit einem Befestigungspfosten (605) ausgestattet ist, wobei ein elastisches Blatt (66) an dem Befestigungspfosten (605) befestigt ist, der an der unteren Fläche (602) des Luftaufnahmeraums (60) bereitgestellt ist.

3. Luftkompressor nach Anspruch 1, ferner **dadurch gekennzeichnet, dass** der Kopf (61) an seiner Außenfläche zwischen dem oberen Flansch (611) und dem unteren Flansch (612) eine ringförmige Nut (64) definiert, wobei die ringförmige Nut (64) mit dem Luftaufnahmeraum (60) nicht in Verbindung steht, und wobei ein zweites Ende (622) des Kolbenkörpers (6) ein Lagerloch (63) definiert und wobei ein luftdichter Ring (65), der als O-Ring funktioniert, in die ringförmige Nut (64) des Kopfes (61) des Kolbenkörpers (6) eingepasst ist.

4. Luftkompressor nach Anspruch 1, ferner **dadurch gekennzeichnet, dass** der Einlasskanal (702) sich von dem oberen Flansch (711) nach unten erstreckt, wobei der Luftaufnahmeraum (70) sich von dem oberen Flansch (711) nach unten erstreckt und mit dem Einlasskanal (702) nicht in Verbindung steht, wobei ein Befestigungspfosten (713) an dem oberen Flansch (711) bereitgestellt ist, wobei ein elastisches Blatt (76), das in der Lage ist, den Einlasskanal (702) zu schließen, an dem Befestigungspfosten (713) befestigt ist, der an dem oberen Flansch (711) bereitgestellt ist.

5. Luftkompressor nach Anspruch 1, ferner **dadurch gekennzeichnet, dass** der Zylinder (3) eine obere Wand (32) an seiner Oberseite aufweist, wobei die obere Wand (32) des Zylinders (3) ein Ausgangsloch (33) definiert, das mit einem Luftspeicherbehälter (4) an dem Zylinder (3) in Verbindung steht, wobei der Luftspeicherbehälter (4) mit einer Vielzahl an Auslässen (41,42,43) ausgestattet ist, von denen einer mit einem Schlauch verbunden ist, von denen einer mit einem Druckmesser verbunden ist und denen von einer mit einem Überdruckventil (5) verbunden ist, das eine weiche Kappe (51) an seinem innersten Ende umfasst, wobei ein Stopfen (44) in dem Luftspeicherbehälter (4) an dem Ausgangsloch (33) bereitgestellt ist und wobei die Oberseite des Stopfens (44) von einer Kompressionsfeder (46) gedrückt wird.

6. Luftkompressor nach Anspruch 5, ferner **dadurch gekennzeichnet, dass** der Schlauch (14), der mit einem der Auslässe des Luftspeicherbehälters (4) verbunden ist, in der Lage ist, in dem Gehäuse (1) untergebracht zu werden und von einer Abdeckung (15) geschlossen zu werden.

7. Luftkompressor nach Anspruch 1, ferner **dadurch gekennzeichnet, dass** das Gehäuse (1) mit einem Schalter (11) ausgestattet ist, um die Kompressoreinheit zu starten oder zu stoppen, wobei der Druckmesser (12) zu einer Außenseite des Gehäuses (1) exponiert ist, wobei eine Druckstange (131) eine Knopfes (13) durch einen Bolzen (52) eingesteckt ist, um eine weiche Kappe (51) eines Überdruckventils (5) zu berühren, das mit der Kompressoreinheit verbunden ist.

8. Luftkompressor nach Anspruch 1, ferner **dadurch gekennzeichnet, dass**, wenn der Kolbenkörper (7), der in dem Zylinder (3) Pendelbewegungen durchführt, an seinem oberen Totpunkt ist, ein Raum zwischen einer oberen Wand (32) des Zylinders (3) und dem Kopf (61) des Kolbenkörpers (6) existiert.

Revendications

1. Compresseur d'air comprenant un boîtier (1) et un groupe compresseur installé dans le boîtier (1), dans lequel le groupe compresseur comporte un corps de piston (6)(7) entraîné par un moteur (21) pour effectuer un mouvement de va-et-vient dans un cylindre (3), dans lequel le corps de piston (6)(7) comprend une tête (61)(71) et une tige (62)(72), dans lequel la tête (61)(71) définit un canal d'admission (604)(702) à travers celle-ci et définit un espace de réception d'air (60)(70) dans celle-ci, dans lequel la tête (61)(71) du corps de piston (6)(7) forme une bride supérieure plate (611)(711) dans sa partie supérieure et forme une bride inférieure (612)(712) sous la bride supérieure (611)(711), dans lequel la bride inférieure (612)(712) de la tête (6)(7) est jointe à une

première extrémité (621)(721) de la tige (62)(72), **caractérisé en ce que** un canal d'admission unique (604)(702) est prévu sur la tête (61)(71), et l'espace de réception d'air (60)(70) est formé comme une cavité permettant de stocker de l'air comprimé supplémentaire, dans lequel ladite cavité est délimitée par une surface inférieure (602) et une surface périphérique (603) et est ouverte au niveau d'une ouverture supérieure (601)(701) formée dans la partie supérieure de la tête (61)(71), dans lequel la surface inférieure (602) est définie dans la tête (61)(71) à une profondeur proche de la bride inférieure (612)(712) de la tête (61)(71), de sorte que l'espace de réception d'air (60)(70) s'étendant vers le bas depuis l'ouverture supérieure (601)(701) jusqu'à la surface inférieure (602) a une profondeur correspondant quasiment à une distance entre la bride supérieure plate (611)(711) et la bride inférieure (612)(712).

2. Compresseur d'air selon la revendication 1, **caractérisé en outre en ce que**: le canal d'admission (604) s'étend vers le bas depuis la surface inférieure (602) de l'espace de réception d'air (60) et en communiquant avec l'espace de réception d'air (60), la surface inférieure (602) de l'espace de réception d'air (60) étant pourvue d'un montant de fixation (605); une feuille élastique (66) est fixée sur le montant de fixation (605) prévu sur la surface inférieure (602) de l'espace de réception d'air (60).

3. Compresseur d'air selon la revendication 1, **caractérisé en outre en ce que**: la tête (61) définit une rainure annulaire (64) au niveau de sa surface extérieure, entre la bride supérieure (611) et la bride inférieure (612), la rainure annulaire (64) ne communiquant pas avec l'espace de réception d'air (60), et une seconde extrémité (622) du corps de piston (6) définissant un trou de pivot (63); une bague étanche (65), qui fonctionne comme un joint torique, est ajustée dans la rainure annulaire (64) de la tête (61) du corps de piston (6).

4. Compresseur d'air selon la revendication 1, **caractérisé en outre en ce que**: le canal d'admission (702) s'étendant vers le bas depuis la bride supérieure (711); l'espace de réception d'air (70) s'étendant vers le bas depuis la bride supérieure (711) et ne communiquant pas avec le canal d'admission (702); un montant de fixation (713) est prévu sur la bride supérieure (711), une feuille élastique (76) étant fixée sur le montant de fixation (713) prévu sur la bride supérieure (711) capable de fermer le canal d'admission (702).

5. Compresseur d'air selon la revendication 1, **caractérisé en outre en ce que**: le cylindre (3) comporte une paroi supérieure (32) dans sa partie supérieure, la paroi supérieure (32) du cylindre (3) définissant un trou de sortie (33) communiquant avec un récipient de stockage d'air (4) sur le cylindre (3), le récipient de stockage d'air (4) étant pourvu d'une pluralité de sorties (41, 42, 43), dont l'une est reliée à un tuyau flexible, dont l'une est reliée à un manomètre et dont l'une est reliée à une soupape de détente (5) qui comporte un capuchon mou (51) à son extrémité intérieure; un bouchon (44) est prévu dans le récipient de stockage d'air (4), sur le trou de sortie (33), la partie supérieure du bouchon (44) étant poussée par un ressort de compression (46).

6. Compresseur d'air selon la revendication 5, **caractérisé en outre en ce que**: le tuyau flexible (14) relié à l'une des sorties du récipient de stockage d'air (4) peut être logé dans le boîtier (1) et fermé par un couvercle (15).

7. Compresseur d'air selon la revendication 1, **caractérisé en outre en ce que**: le boîtier (1) est pourvu d'un commutateur (11) permettant de démarrer ou d'arrêter le groupe compresseur, le manomètre (12) étant exposé à l'extérieur du boîtier (1), une barre de poussée (131) d'un bouton (13) étant insérée au travers d'un boulon (52) pour toucher un capuchon mou (51) d'une soupape de détente (5) reliée au groupe compresseur.

8. Compresseur d'air selon la revendication 1, **caractérisé en outre en ce que**: lorsque le corps de piston (7) qui effectue un mouvement de va-et-vient dans le cylindre (3) se trouve à un point mort supérieur, un espace existe entre une paroi supérieure (32) du cylindre (3) et la tête (61) du corps de piston (6).

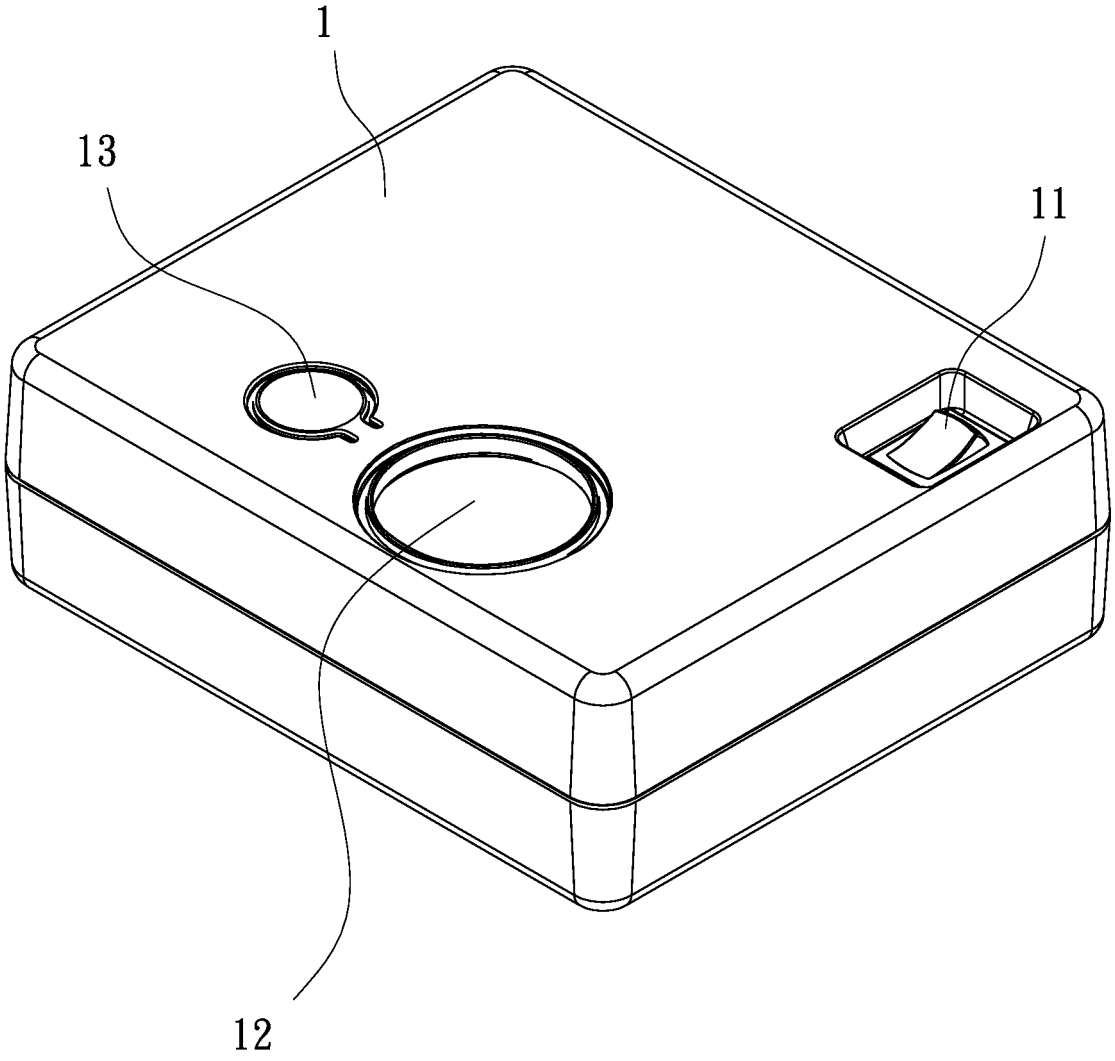

FIG. 1

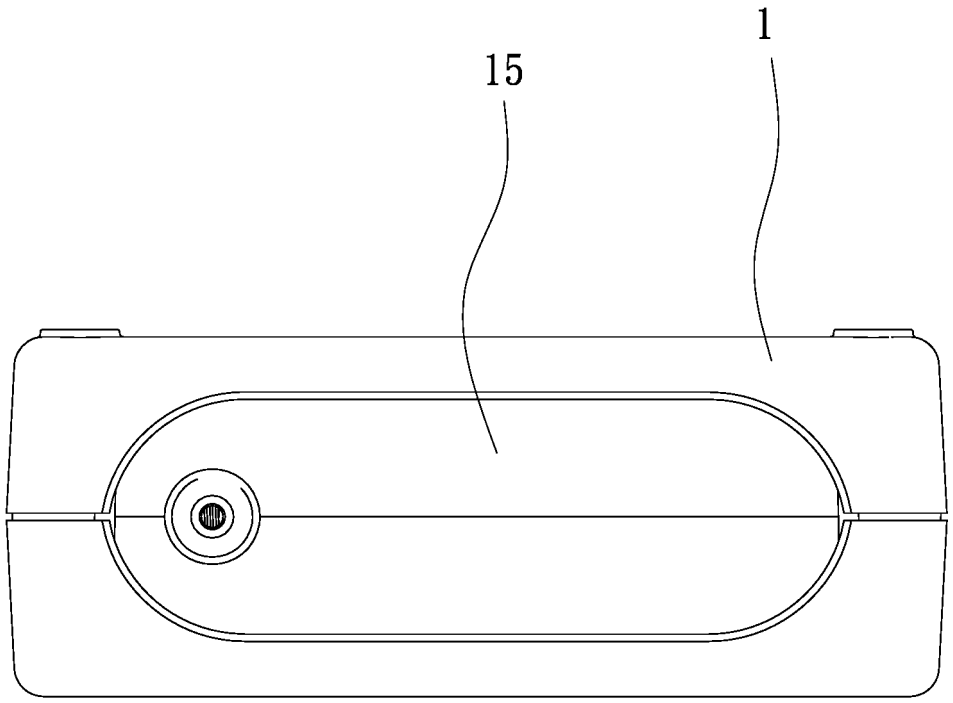

FIG. 2

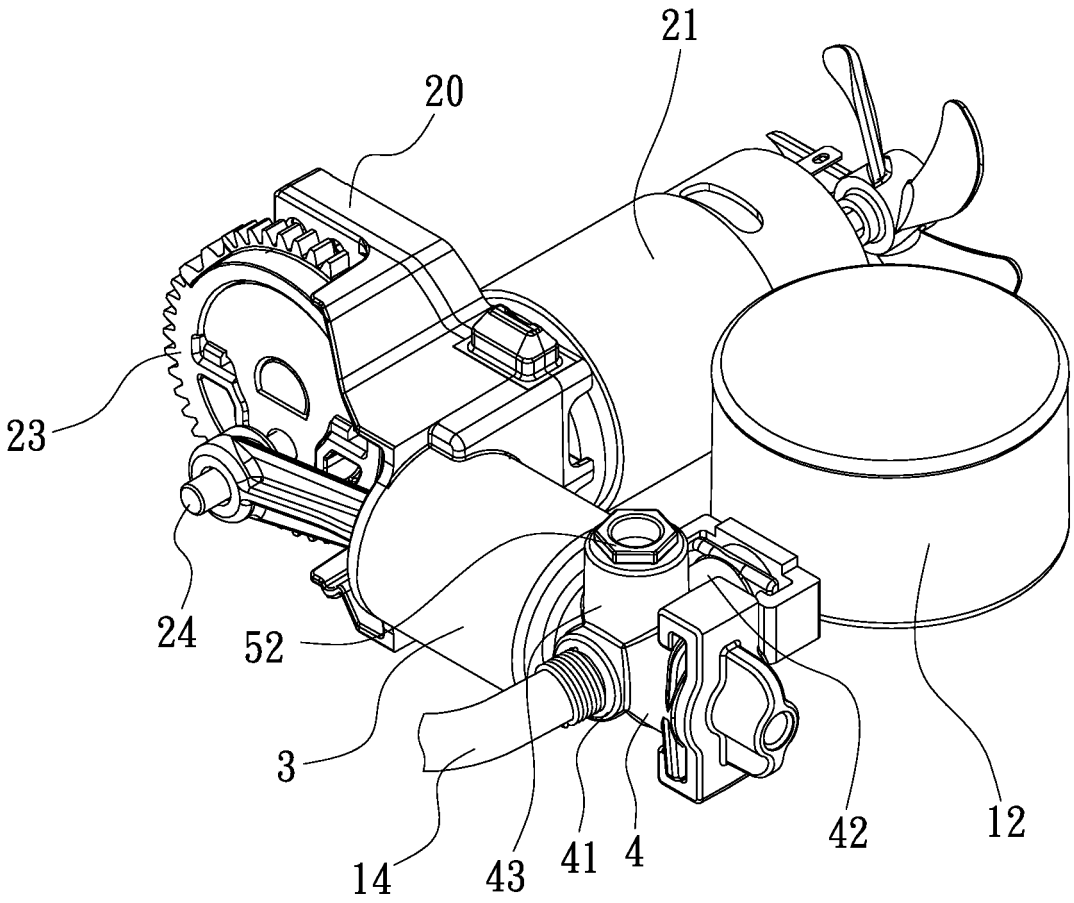

FIG. 3

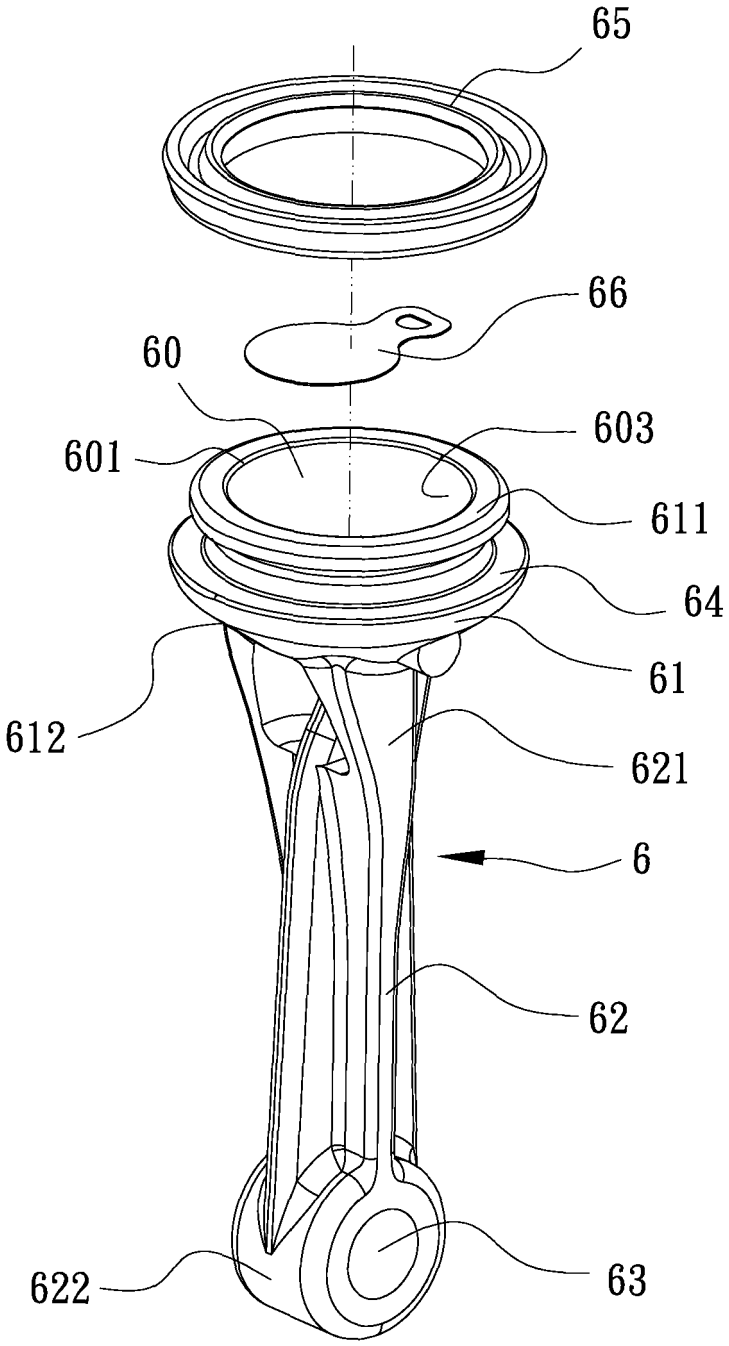

FIG. 4

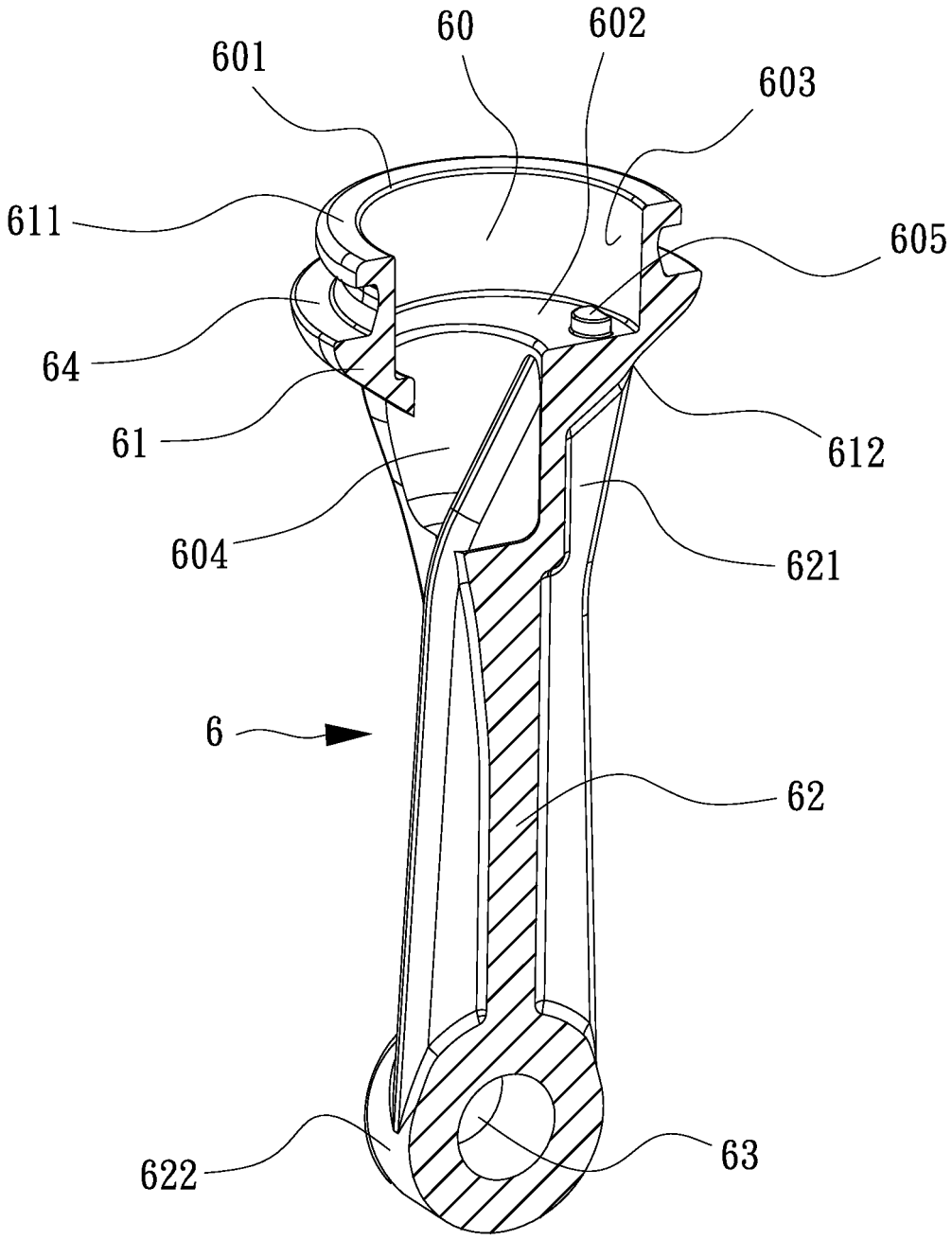

FIG. 5

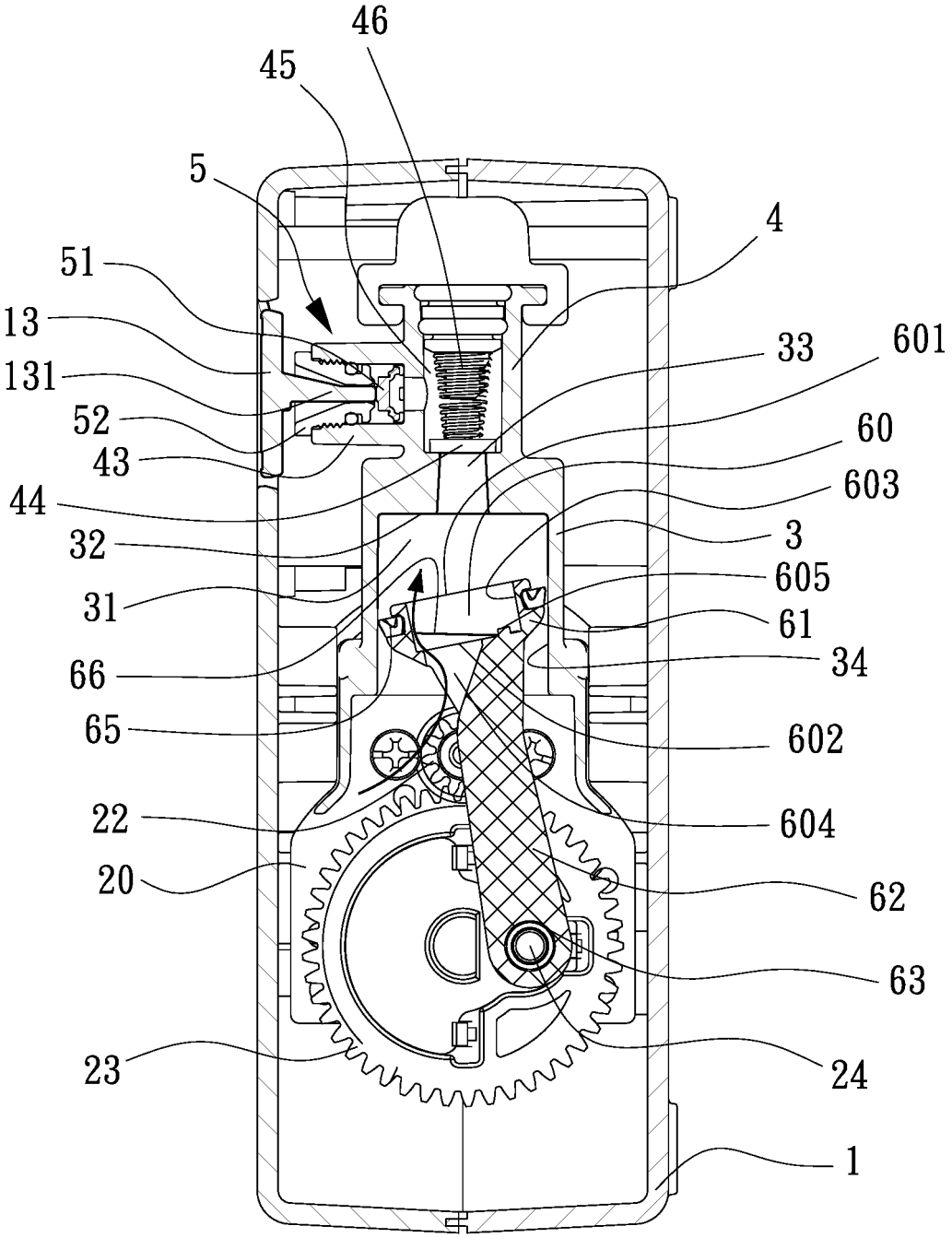
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FIG. 6

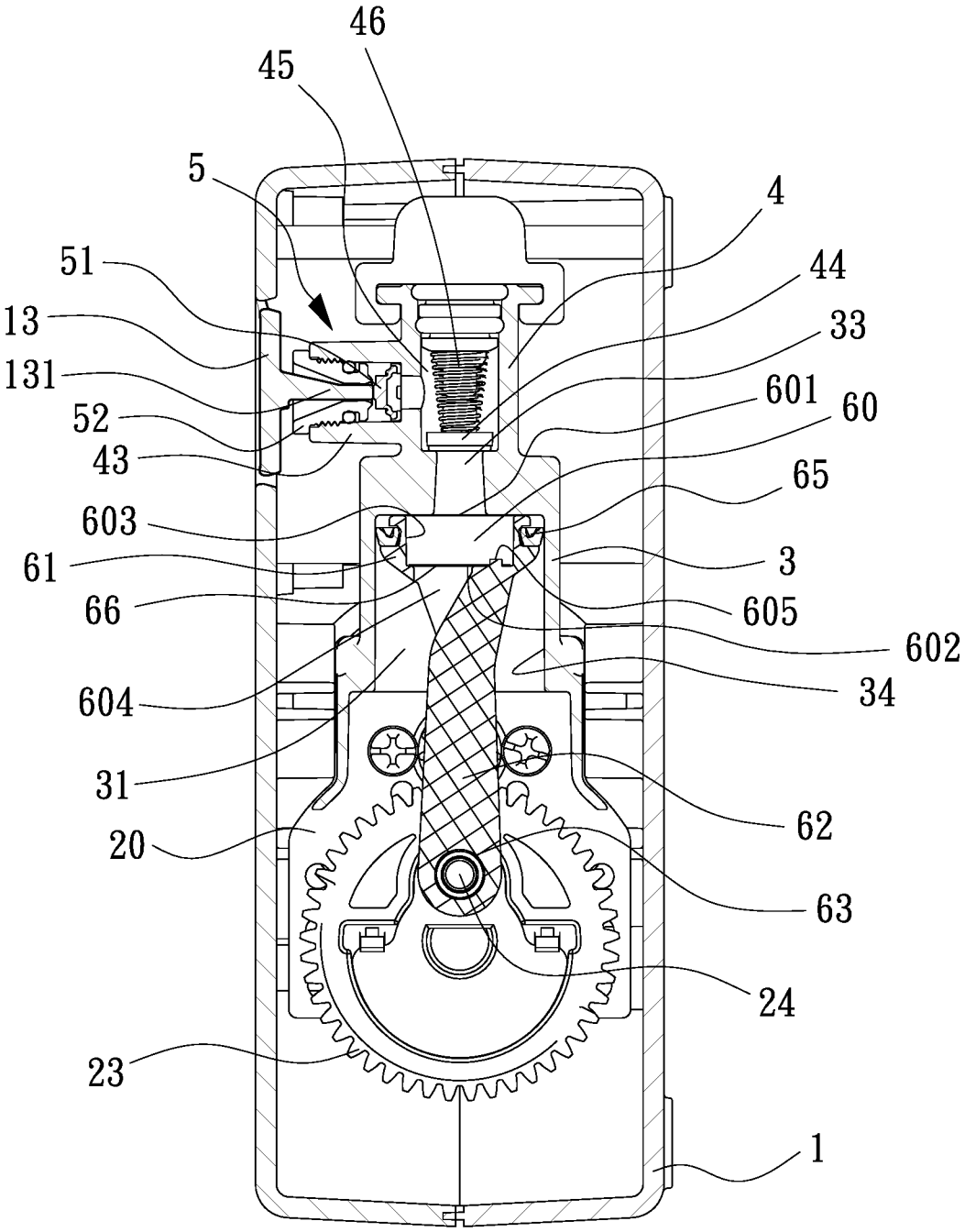
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FIG. 7

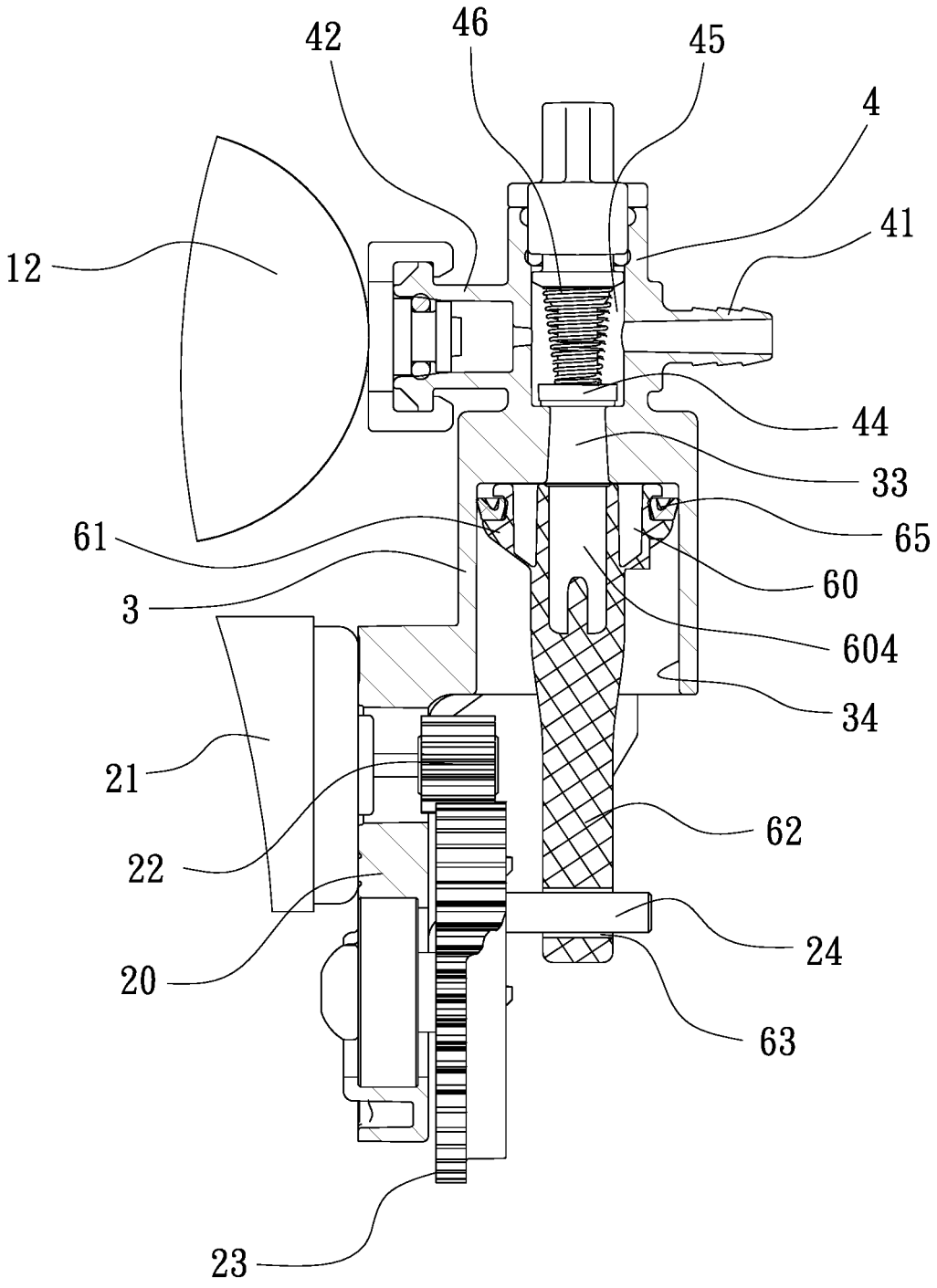

FIG. 8

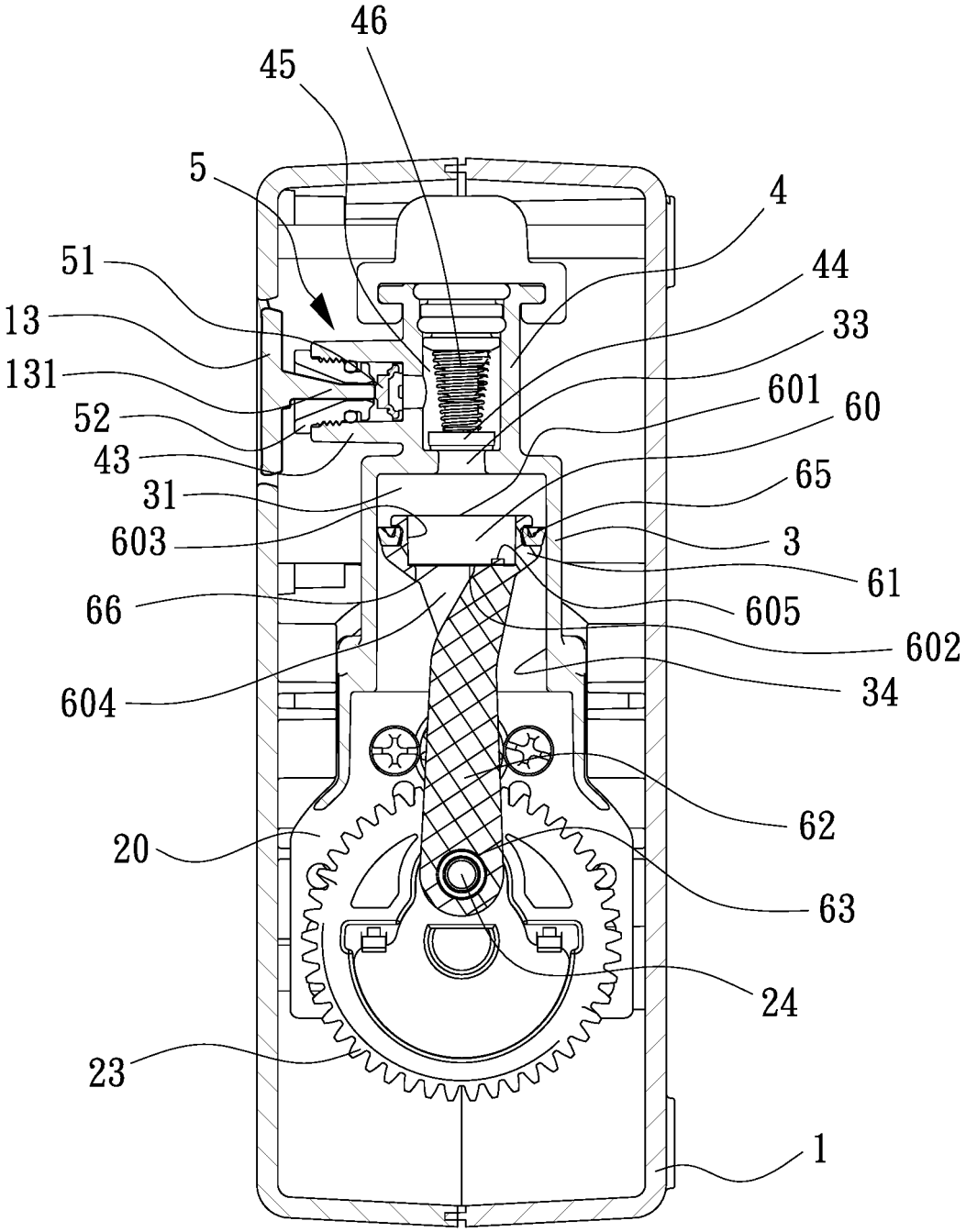
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FIG. 9

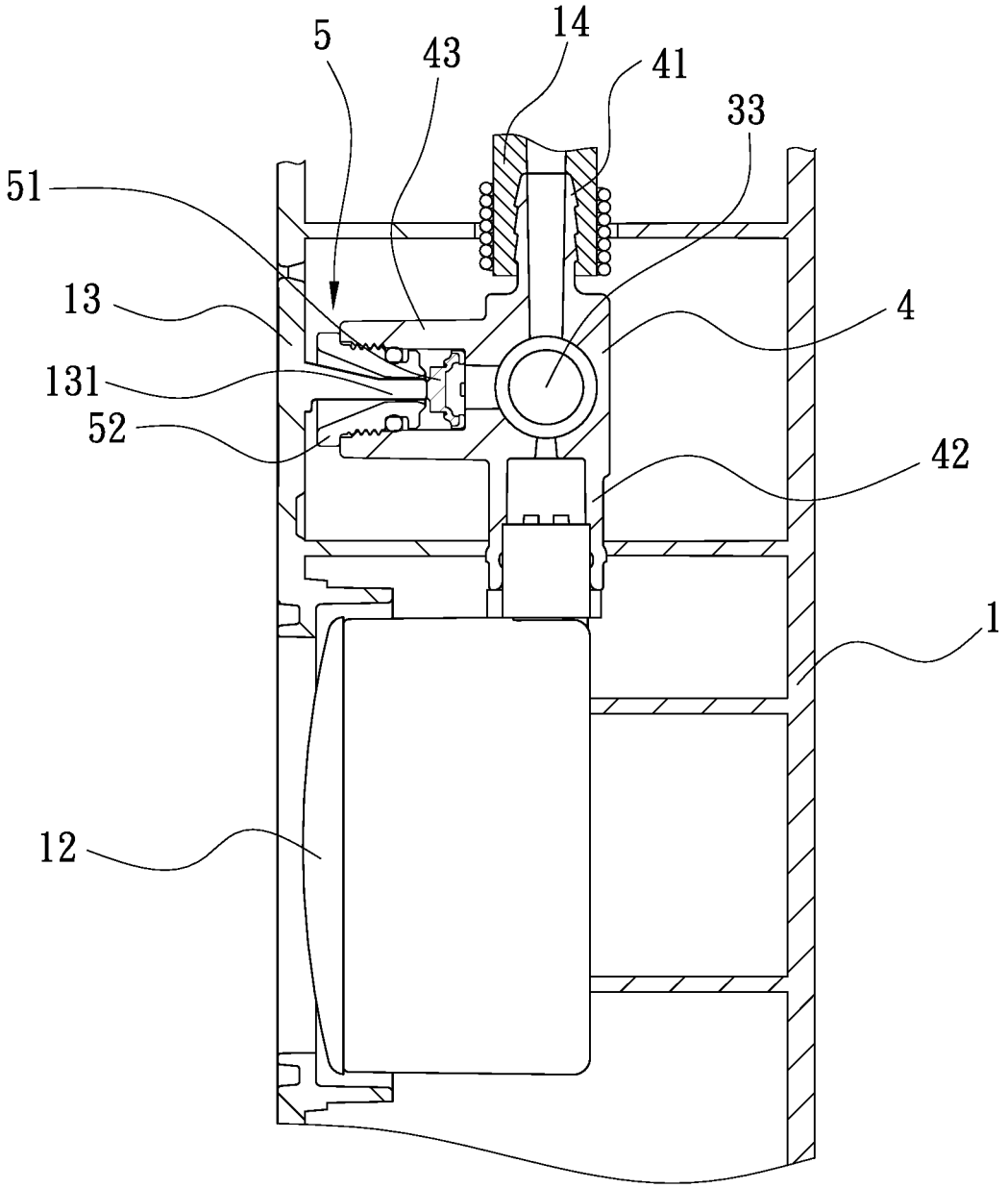

FIG. 10

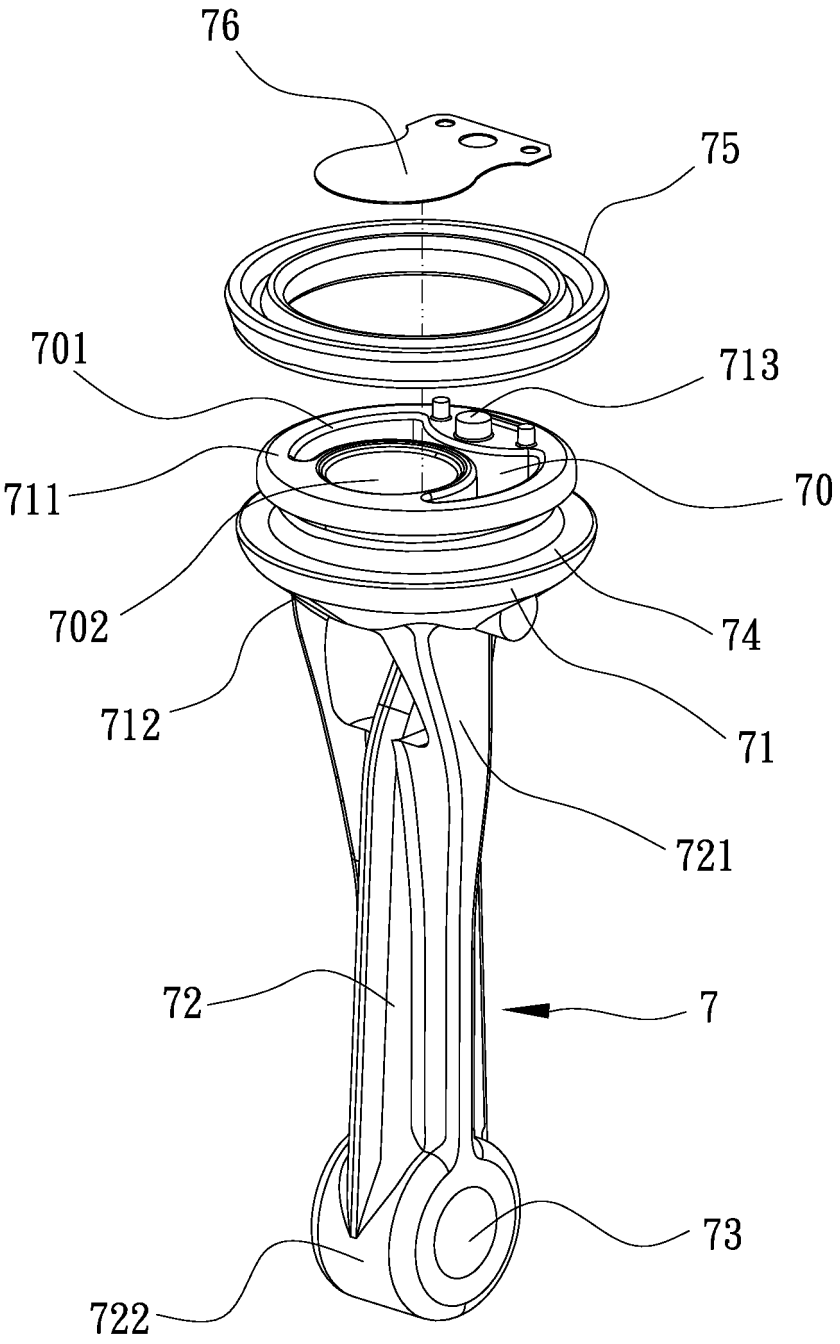

FIG. 11

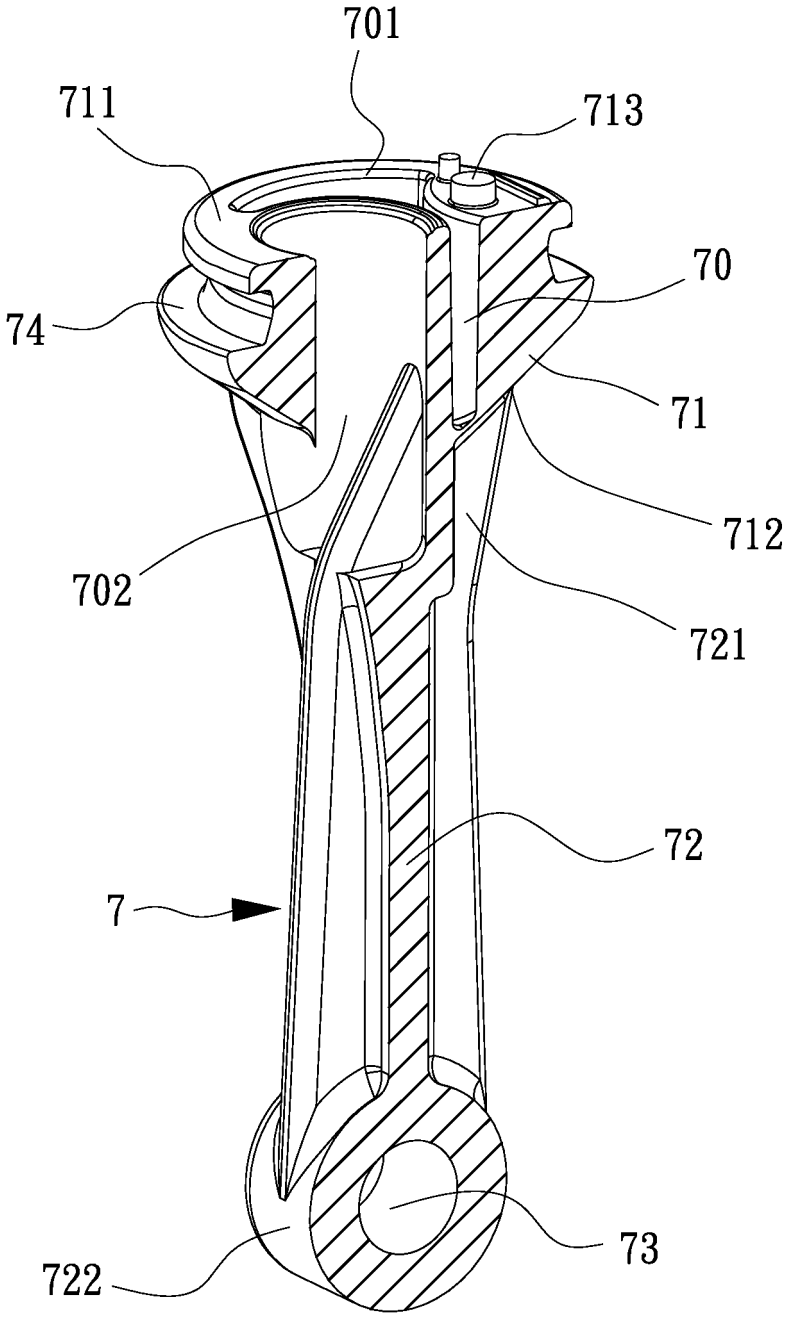

FIG. 12

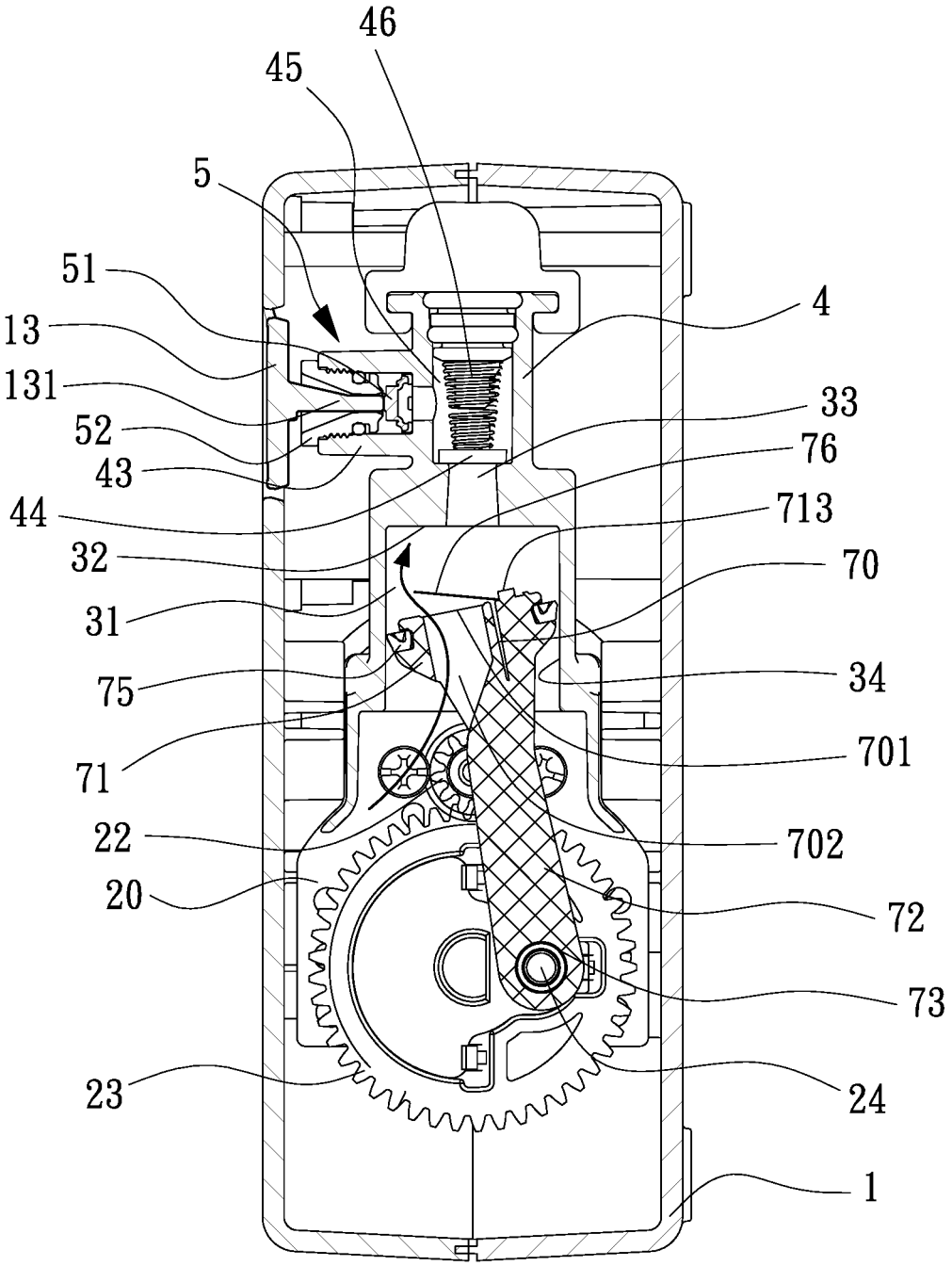
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FIG. 13

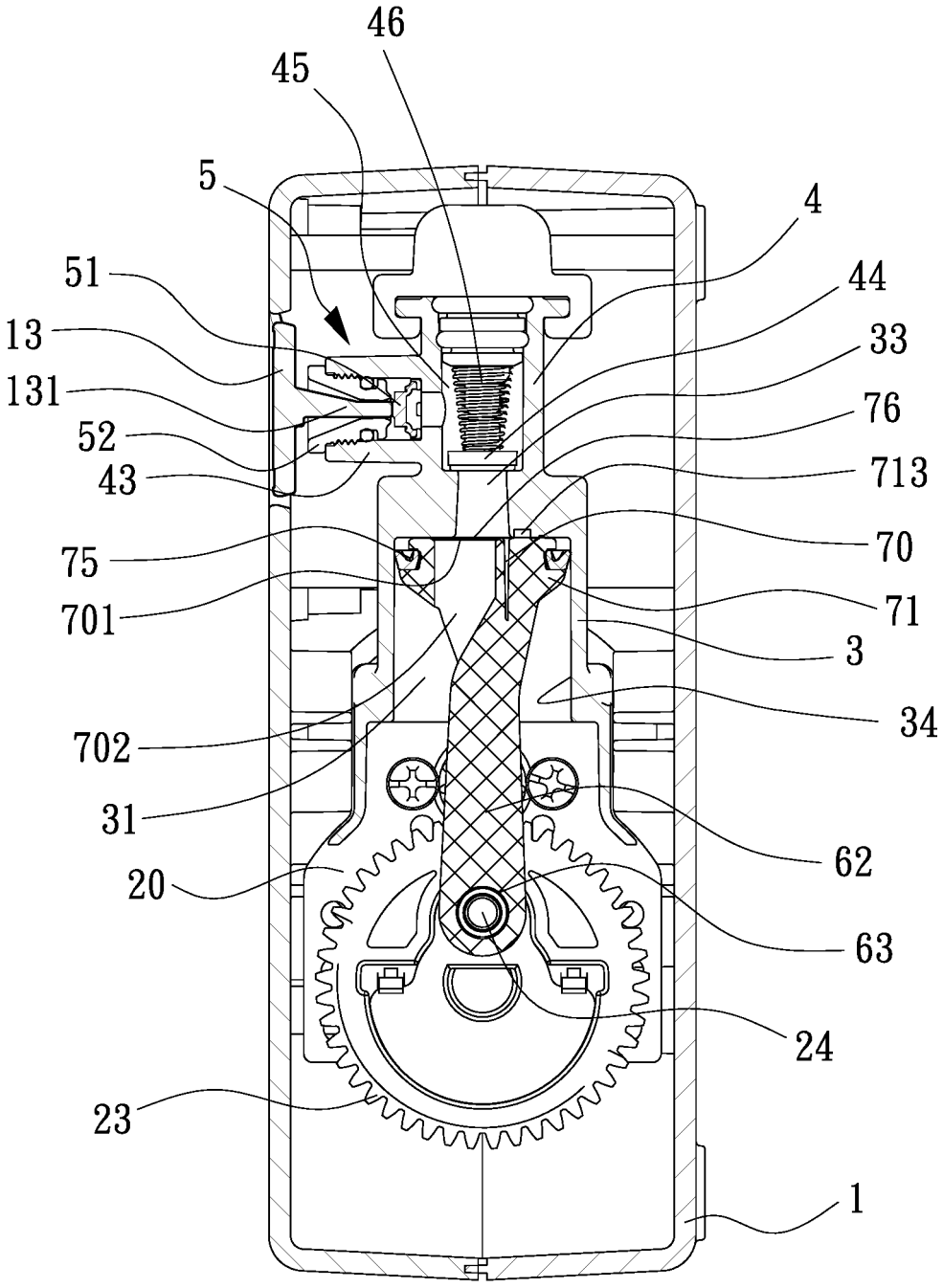
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FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5655887 A **[0002]**