



(11) **EP 3 670 791 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
19.05.2021 Bulletin 2021/20

(51) Int Cl.:
E05B 9/04 ^(2006.01) **E05B 9/10** ^(2006.01)
E05B 17/20 ^(2006.01)

(21) Application number: **18214395.8**

(22) Date of filing: **20.12.2018**

(54) **LOCK ASSEMBLY**

VERRIEGELUNGSANORDNUNG

ENSEMBLE DE VERROUILLAGE

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(43) Date of publication of application:
24.06.2020 Bulletin 2020/26

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DescriptionBACKGROUND OF THE INVENTION

1. Fields of the invention

[0001] The present invention relates to a lock assembly, and more particularly, to a lock assembly which allows the users to unlock the lock assembly by using the push portion of the first block to push the second driving member to be removed from the at least one slot, and core at the outside rotates freely, even if an object is inserted into the core at the inside.

2. Descriptions of Related Art

[0002] Most of the conventional locks installed to a door designed to be unlocked from inside or outside of the door are required to rotate one core at one side of the lock. When a key is inserted into the core of the lock assembly, the key pushes a block in the core to be engaged with a cam so that the core is rotated to unlock the lock. However, when the block is engaged with cam, the other block located the other end of the lock will be pushed so that there is no way to insert another key from the other end of the door. Although this is designed for safety reason, this design may result unexpected situations, especially when in emergency. For example, if a key or an object is inserted into the keyhole from outside, then the users cannot insert another key from the inside to unlock the lock. Therefore, when the lock is used in public facilities, such as homes, clinics or schools, if one key or object is left to the lock and is not removed, then the lock cannot be unlocked from the other side even though the users have a correct key. In an emergency situation, the lock cannot be unlocked from inside of the doors and can result in a disaster.

[0003] EP 2679749 B1 discloses an anti-break lock wherein the contact portion of the pin can inserted into the notch of the second block to achieve the purposes of the invention, however, when the core is damaged and removed by un-authorized persons, the notch of the second block cannot be aligned with the contact portion so that the above mentioned feature cannot be achieved

[0004] DE 38 28 354 A1 discloses a lock assembly comprising: a casing having a collar received therein, the collar located between an inner unity and an outer unit, the collar having at least one first slot defined axially in an inner periphery thereof; the inner unit having a first part, a first block and a first driving member, the first part driving the first block and the first driving member, the first block having a push portion, the first driving member having at least one first lateral piece that is located corresponding to the first slot, and a receiving hole that is located corresponding to the push portion, at least one inner spring located between the first block and the first driving member; and the outer unit having a second part, a second block and a second driving member, the second

part driving the second block and the second driving member, the second driving member having at least one second lateral piece that is located corresponding to the first slot, and at least one outer spring located between the second block and the second driving member.

[0005] The present invention is intended to provide a lock assembly that is designed to eliminate the drawbacks mentioned above.

10 SUMMARY OF THE INVENTION

[0006] The present invention relates to a lock assembly and comprises a casing having a collar received therein, and the collar is located between an inner unity and an outer unit. The collar includes at least one first slot defined axially in the inner periphery thereof. The inner unit includes a first part, a first block and a first driving member, wherein the first part drives the first block and the first driving member. The first block includes a push portion. The first driving member includes at least one first lateral piece that is located corresponding to the first slot, and a receiving hole that is located corresponding to the push portion. At least one inner spring is located between the first block and the first driving member.

[0007] The outer unit includes a second part, a second block and a second driving member, wherein the second part drives the second block and the second driving member. The second driving member includes at least one second lateral piece that is located corresponding to the first slot, and a contact portion that is located corresponding to the push portion and the at least one receiving hole. At least one outer spring is located between the second block and the second driving member.

[0008] When unlocking the lock assembly from outside of the lock assembly, the second block is moved toward the collar to compress the outer spring to axially push the first driving member to compress the at least one inner spring so that the first driving member is not located in the at least one slot. The second lateral piece of the second driving member enters into the at least one slot. The collar is operated by the second part via the second driving member.

[0009] When unlocking the lock assembly from inside of the lock assembly, the first block is moved toward the collar to compress the inner spring. The push portion of the first block pushes the contact portion of the second driving member via the receiving hole so that the outer spring is compressed by the second driving member. The second driving member moves to a position where the second lateral piece is removed from the at least one first slot. The first driving member is pushed by the inner spring and the at least one first lateral piece enters into the at least one slot so that the collar is operated by the first part via the first driving member.

[0010] Preferably, the first part includes at least one first slot defined axially in the first end thereof, and a first notch is defined in the second end of the first part and located corresponding to the at least one first lateral

piece. The first block includes a protrusion which is slidably located in the at least one first slot. The at least one first lateral piece is slidably located in the first notch. When the lock assembly is unlocked from the inside of the lock assembly, the at least one first lateral piece is located corresponding to the at least one slot, the at least one first lateral piece is located in the first notch and the at least one slot.

[0011] Preferably, the second part includes at least one second slot defined axially in the first end thereof. A second notch is defined in the second end of the second part and located corresponding to the at least one second lateral piece. The second block includes a slide which is slidably located in the second slot. The at least one first lateral piece is slidably located in the second notch. When the lock assembly is unlocked from the outside of the lock assembly, the at least one second lateral piece is located corresponding to the at least one slot. The second slot is located corresponding to the at least one first lateral piece. The at least one second lateral piece is located in the second notch and the at least one slot.

[0012] Preferably, the first block includes at least one first connection portion. The first driving member includes at least one receiving hole which is located corresponding to the at least one first connection portion. The inner spring is connected between the at least one first connection portion and the at least one receiving hole.

[0013] Preferably, the second block includes at least one second connection portion. The second driving member includes at least one connection member which is located corresponding to the at least one second connection portion. The outer spring is connected between the at least one second connection portion and the at least one connection member.

[0014] Preferably, two cores are received in the casing and respectively located corresponding to the inner unit and the outer unit. The core that is located corresponding to one end of the outer unit is located opposite to the collar. An end part is located corresponding to each of the two cores and includes a transmission plate which is located off from the axis of the end part and located on a curve path that the core rotates. Each of the first part and the second part includes a guide groove in which the transmission plate corresponding thereto is inserted.

[0015] Preferably, the end parts each include a passage and at least one insertion. Each of the first and second blocks includes a connection portion that is connected to the at least one insertion corresponding thereto.

[0016] Preferably, the end part and the transmission plate are integrally formed to the core corresponding thereto.

[0017] Preferably, each of the end parts include an extension member located in the passage. Each of the two cores has a keyhole and the extension member is located corresponding to the keyhole. A key is inserted into the keyhole to push the extension member, and the extension member pushes the first block or the second block.

[0018] Preferably, each of the casing includes two receiving portions which are respectively located corresponding to the first part and the second part. The collar is located between the two receiving portions. The casing includes a through hole that faces the second part. A first spring and a first pin are received in the through hole. The first pin includes a neck. The casing includes a positioning groove which communicates with the through hole. A second spring and a second pin are received in the positioning groove. The second part includes multiple radial holes located corresponding to the first pin, the at least one insertion and the second block. Each radial hole has an end piece received therein which is supported by the at least one insertion and the second block. When the lock assembly is unlocked, the first pin is biased by the first spring and contacts the end piece or outside of the second part. The second pin is biased by the second spring and contacts outside of the first pin. When the lock assembly is locked, the end piece is not supported by the at least one insertion and the second block, and is disengaged from the radial hole. One of the radial holes is located corresponding to the first pin which is biased by the first spring and is inserted into the radial hole corresponding thereto. The neck is located corresponding to the positioning groove, and the second pin is biased by the second spring and engaged with the neck.

[0019] The advantages of the present invention are that when unlocking the lock assembly from outside of the lock assembly, the second lateral piece of the second driving member enters into the at least one slot, the collar is operated by the second part via the second driving member.

[0020] When a key is inserted into lock assembly, the push portion of the first block pushes the contact portion of the second driving member via the receiving hole so that the core on the outside of the lock assembly can be freely rotated. The first driving member is pushed by the inner spring and the at least one first lateral piece enters into the at least one slot so that the collar is operated by the first part via the first driving member. In other words, the people can unlock the lock assembly in emergency even if a key or an object is inserted into the lock assembly from outside.

[0021] Furthermore, for safety reason, when the key is inserted into the lock assembly from inside, the core on the outside of the lock assembly can only be freely rotated and cannot unlock the lock assembly from outside.

[0022] By the transmission plate, the torque that the cores drive the second part or the first part is increased to assist the users to unlock the lock assembly. This is helpful when the door is slightly deformed due to temperature difference, and the collar is stocked against the strike plate.

[0023] There are multiple radial holes defined in the second part and located corresponding to the first pin to prevent unauthorized persons from damaging the core and rotating the core to block the first pin from being

engage with the radial hole to unlock the lock assembly. By the multiple radial holes, the core cannot be rotated to an angle and removed. When rotating the second part, one of the radial holes will be aligned with the first pin. And, when the end piece is not supported by the insertion and the second block, the first pin is engaged with the radial hole, and the second pin is biased by the second spring and reaches the neck, so that the first pin cannot be pushed backward, and the second part is locked and cannot rotate the collar to unlock the lock assembly. Therefore, the lock assembly has better anti-break features.

[0024] The present invention will become more obvious from the following description when taken in connection with the accompanying drawings which show, for purposes of illustration only, a preferred embodiment in accordance with the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025]

Fig. 1 is a perspective view to show the lock assembly of the present invention;
 Fig. 2 is an exploded view of the lock assembly of the present invention;
 Fig. 3 is an exploded view of the outer unit of the lock assembly of the present invention;
 Fig. 4 is an exploded view of the inner unit of the lock assembly of the present invention;
 Fig. 5 is a cross sectional view, taken along line A-A of Fig. 1;
 Fig. 6 shows the combination of the two cores, the collar and the inner and outer units of the lock assembly of the present invention;
 Fig. 7 is a cross sectional view to show when the lock assembly is to be unlocked from outside;
 Fig. 8 is similar to Fig. 6 and shows when the lock assembly is to be unlocked from outside;
 Fig. 9 is a cross sectional view to show that the core and the collar are rotated as disclosed in Fig. 7;
 Fig. 10 illustrates the status disclosed in Fig. 9
 Fig. 11 shows that another key is inserted into the core from the inside of the lock assembly;
 Fig. 12 illustrates the status disclosed in Fig. 11;
 Fig. 13 is a cross sectional view to show that the lock assembly is unlocked from inside;
 Fig. 14 illustrates the status disclosed in Fig. 13;
 Fig. 15 is a cross sectional view to show that the lock assembly is in locked status, and
 Fig. 16 is a cross sectional view, taken along line B-B of Fig. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0026] Referring to Figs. 1 to 6, the lock assembly of the present invention comprises a casing 1 having a collar

2 received therein, and the collar 2 is located between an inner unit 3 and an outer unit 4. The collar 2 has at least one first slot 21 defined axially in the inner periphery thereof.

[0027] The inner unit 3 includes a first part 31, a first block 32 and a first driving member 33. The first part 31 drives the first block 32 and the first driving member 33. The first block 32 has a push portion 321. The first driving member 33 has at least one first lateral piece 331 that is located corresponding to the first slot 21, and a receiving hole 332 that is located corresponding to the push portion 321. At least one inner spring 34 is located between the first block 32 and the first driving member 33.

[0028] The first part 31 includes at least one first slot 311 defined axially in the first end thereof, and a first notch 312 is defined in the second end of the first part 31 and located corresponding to the at least one first lateral piece 331. The first block 32 includes a protrusion 322 which is slidably located in the at least one first slot 311. The at least one first lateral piece 331 is slidably located in the first notch 312. The first part 31 drives the first block 32 and the first driving member 33 even if the first block 32 and the first driving member 33 are not applied by any force. Specifically, the at least one first connection portion 323 is a protrusion that is located corresponding to the inner spring 34, and the at least one receiving hole 333 receives one end of the inner spring 34 to prevent the inner spring 34 from shifting and disengaging therefrom. Preferably, there are multiple inner springs 34 installed to prevent the first block 32 and the first driving member 33 from shifting and being stocked against the inside of the first part 31 when the first part 31 moves.

[0029] The outer unit 4 includes a second part 41, a second block 42 and a second driving member 43. The second part 41 includes at least one second slot 411 defined axially in the first end thereof, and a second notch 412 is defined in the second end of the second part 41 and located corresponding to the at least one second lateral piece 431. The second block 42 includes a slide 421 which is slidably located in the second slot 411. The at least one first lateral piece 331 is slidably located in the second notch 412. In order to reduce manufacturing cost, the first and second parts 31, 41 are identical and able to be respectively connected to the first block 32 and the first driving member 33, or to be respectively connected to the second block 42 and the second driving member 43. The second block 42 includes at least one second connection portion 422. The second driving member 43 includes at least one connection member 433 which is located corresponding to the at least one second connection portion 422. The outer spring 44 is connected between the at least one second connection portion 422 and the at least one connection member 433. The at least one second connection portion 422 and the at least one connection member 433 can be a protrusion and a hole or recess to position the outer spring 44. In order to ensure that the second block 42 and the second

driving member 43 are stably moved in the second part 41, there are multiple outer springs 44 installed.

[0030] When the lock assembly is installed to a door of a room, inside means the interior side of the room and outside means the exterior of the room. The inner unit 3 is located at the inside of the lock assembly and the outer unit 4 is located at the outside of the lock assembly.

[0031] When unlocking the lock assembly from outside, the second block 42 is applied by a force and moved toward the collar 2 to compress the outer spring 44 so as to axially push the first driving member 33 to compress the at least one inner spring 34 so that the first driving member 33 is not located in the at least one slot 21. The second lateral piece 431 of the second driving member 43 enters into the at least one slot 21 when the at least one slot 21 is located aligned with the second driving member 43. The collar 2 is operated by the second part 41 via the second driving member 43. The at least one second lateral piece 431 is located corresponding to the at least one slot 21. The second slot 412 is located corresponding to the at least one first lateral piece 331. The at least one second lateral piece 431 is located in the second notch 412 and the at least one slot 21.

[0032] When unlocking the lock assembly from inside, the first block 32 is applied by a force and moved toward the collar 2 to compress the inner spring 34. The push portion 321 of the first block 32 pushes the contact portion 432 of the second driving member 43 via the receiving hole 332 so that the outer spring 44 is compressed by the second driving member 43. The second driving member 43 moves to a position where the second lateral piece 432 is removed from the at least one first slot 21. The first driving member 33 is pushed by the inner spring 34. The at least one first lateral piece 331 is located corresponding to the at least one slot 21. The first part 31 drives the collar 2 via the first driving member 33, and when the at least one lateral pieces 331 is located corresponding to the at least one slot 21, the at least one first lateral piece 331 is located in the first notch 312 and enters into the at least one slot 21.

[0033] The lock assembly further includes two cores 5 which are received in the casing 1 and respectively located corresponding to the inner unit 3 and the outer unit 4. The core 5 that is located corresponding to one end of the outer unit 4 is located opposite to the collar 2. In order to increase the torque that the cores 5 drive the first part 31 and the second part 41, an end part 51 is located corresponding to each of the two cores 5 and includes a transmission plate 52 which is located off from the axis of the end part 51 and located on a curve path that the core 5 rotates. Each of the first part 31 and the second part 41 includes a guide groove 521 in which the transmission plate 52 corresponding thereto is inserted. When the door is slightly deformed due to temperature difference between the interior and exterior of the room, the collar 2 is stocked against the strike plate so that the collar 2 is difficult to be driven by the cores 5, the torque that the cores 5 drive the first part 31 and the second part

41 can be increased by the transmission plate 52 and the guide groove 521 to assist the users to rotate the cores 5 easily.

[0034] In one embodiment, the end parts 51 each include a passage 53 and at least one insertion 54. The first and second blocks 32, 42 are located opposite to the passages 53 of the end parts 51 so that when the keys 6, 6' are inserted into the cores 5, the keys 6, 6' push the first block 32 or the second block 42 via the passage 53. Each of the first and second blocks 32, 42 includes a connection portion 55 that is connected to the at least one insertion 54 corresponding thereto so as to drive the cores 5. The torque that is used to drive the collar 2 can also be increased by the at least one insertion 54 driving the first and second blocks 32, 42.

[0035] In this embodiment, the end part 51 and the transmission plate 52 are two separated parts. Alternatively, the end part 51 and the transmission plate 52 may be integrally formed to the core 5 corresponding thereto so as to reduce the number of components and to reduce manufacturing cost.

[0036] In order to ensure that when the keys 6, 6' are inserted into the cores 5 via keyholes 57 can rotate the first block 32 or the second block 42 as expected, each of the end parts 51 include an extension member 56 located in the passage 53. The extension member 56 is located corresponding to the keyhole 57 corresponding thereto. When the keys 6, 6' are inserted into the keyholes 57 to push the extension members 56, and the extension members 56 push the first block 32 or the second block 42.

[0037] As shown in Figs. 7 and 8, when the key 6 is inserted into the keyhole 57 of the core 5 located at the outside, the distal end of the key 6 pushes the second block 42 via the extension member 56. The at least one lateral piece 431 of the second driving member 43 is located at the at least one slot 21. Because the spring force of the outer spring 44 is larger than that of the inner spring 34, so that the first driving member 33 compresses the inner spring 34, and the first driving member 33 is not located at the at least one slot 21. The insertion of the key 6 into the keyhole 57 only moves the second block 42 toward the collar 2 to compress the outer spring 44. When using the key 6 to rotate the core 5, the at least one insertion 54 drive the second block 42, and the transmission plate 52 drives the second part 41. The second part 41 drives the at least one second lateral piece 431 of the second driving member 43 via the second notch 412, so that the at least one second lateral piece 431 drives the collar 2 and unlock the lock assembly as shown in Figs. 9 and 10.

[0038] As shown in Figs. 11 and 12, when the users want to unlock the lock assembly from the inside, the key 6' is inserted into the keyhole 57 of the core 5 located at the inside, the distal end of the key 6' pushes the first block 32 via the extension member 56. The first block 32 is moved toward the collar 2 to compress the inner spring 34, and the push portion 321 pushes the contact portion

432 of the second driving member 43 via the receiving hole 332 so that the outer spring 44 is compressed by the second driving member 43, and the at least one second lateral piece 431 is removed from the at least one slot 21. Therefore, even when the core 5 located at the outside is rotated, the collar 2 is not driven to unlock the lock assembly. In other words, the users in the room is protected and the door cannot be opened from outside. As shown in Figs. 11 and 12, the at least one slot 21 of the collar 2 is not aligned with the at least one first lateral piece 331, so that the inner spring 34 is further compressed. The at least one first lateral piece 331 contacts the lateral side of the collar 2. When the core 5 located at the inside is rotated, the core 5 drives the first block 32 via the at least one insertion 54, and the transmission plate 52 drives the first part 31, so that the first part 31 drives the at least one first lateral piece 331 of the first driving member 33 via the second notch 412. When the at least one first lateral piece 331 is located corresponding to the at least one slot 21, the lock assembly is unlocked from the inside as shown in Figs. 13, 14. The first driving member 33 is driven by the inner spring 34 so that the at least one first lateral piece 331 enters into the at least one slot 21, the core 5 located at the inside drives the collar 2 via the first part 31 and the first driving member 33 to rotate the collar 2 to unlock the lock assembly. Even is a key 6 or an object is inserted into the core 5 at the outside, the core 5 located at the inside can rotate the collar 2. In emergency, the users in the room can use the key 6' to unlock the lock assembly to escape.

[0039] It is noted when there is no key 6 inserted into the core 5 at the outside, and the key 6' is inserted into the core 5 at the inside can also unlock the lock assembly. The push portion 321 contacts the contact portion 432 via the receiving hole 432 to remove the at least one lateral piece 431 from the at least one slot 21. The at least one lateral piece 331 then enters into the at least one slot 21 to rotate the collar 2.

[0040] In order to prevent unauthorized persons to damage the core 5 and remove the core 5 so as to directly rotate the second part 41 to rotate the collar 2 to unlock the lock assembly. Preferably, each of the casing 1 includes two receiving portions 11 which are respectively located corresponding to the first part 31 and the second part 41. The collar 2 is located between the two receiving portions 11. The casing 1 includes a through hole 12 that faces the second part 41. A first spring 13 and a first pin 14 are received in the through hole 12. The first pin 14 includes a neck 141. The casing 1 includes a positioning groove 15 which communicates with the through hole 12. A second spring 16 and a second pin 17 are received in the positioning groove 15. The second part 41 includes multiple radial holes 413 located corresponding to the first pin 14, the at least one insertion 54 and the second block 42. Each radial hole 413 has an end piece 18 received therein which is supported by the at least one insertion 54 and the second block 42. When the lock assembly is unlocked, the first pin 14 is biased by the first

spring 13 and contacts the end piece 18 or an outside of the second part 41. The second pin 17 is biased by the second spring 16 and contacts an outside of the first pin 14. When the lock assembly is locked, the end piece 18 is not supported by the at least one insertion 54 and the second block 42, and is disengaged from the radial hole 413. One of the radial holes 413 is located corresponding to the first pin 14 which is biased by the first spring 13 and is inserted into the radial hole 413 corresponding thereto. The neck 141 is located corresponding to the positioning groove 15. The second pin 17 is biased by the second spring 16 and is engaged with the neck 141 to prevent unauthorized persons to push the first pin 14 from the radial hole 413. This feature avoids authorized persons from rotating the damaged core 5 to shift the first pin 14 off from the radial hole 413. By the multiple radial holes 413, even if the core 5 is rotated any angle and removed, when rotating the second part 41, the first pin 14 will be aligned with one of the radial holes 413. When the end piece 18 is not supported by the at least one insertion 54 and the second block 42, the first pin 14 will be in the radial hole 413, and the second pin 17 is biased by the second spring 16 to be engaged with the neck 141 to prevent the first pin 14 from being pushed backward. Therefore, the second part 41 is locked and the collar 2 is not rotatable to unlock the lock assembly. **[0041]** While we have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the present invention.

Claims

1. A lock assembly comprising:

a casing (1) having a collar (2) received therein, the collar (2) located between an inner unit (3) and an outer unit (4), the collar (2) having at least one first slot (21) defined axially in an inner periphery thereof;

the inner unit (3) having a first part (31), a first block (32) and a first driving member (33), the first part (31) driving the first block (32) and the first driving member (33), the first block (32) having a push portion (321), the first driving member (33) having at least one first lateral piece (331) that is located corresponding to the first slot (21), and a receiving hole (332) that is located corresponding to the push portion (321), at least one inner spring (34) located between the first block (32) and the first driving member (33);

the outer unit (4) having a second part (41), a second block (42) and a second driving member (43), the second part (41) driving the second block (42) and the second driving member (43), the second driving member (43) having at least

one second lateral piece (431) that is located corresponding to the first slot (21), and at least one outer spring (44) located between the second block (42) and the second driving member (43)

characterized in that

the second driving member has a contact portion (432) that is located corresponding to the push portion (321) and the at least one receiving hole (332); and

when unlocking the lock assembly from outside of the lock assembly, the second block (42) is moved toward the collar (2) to compress the outer spring (44) so as to axially push the first driving member (33) to compress the at least one inner spring (34) so that the first driving member (33) is not located in the at least one slot (21), the second lateral piece (431) of the second driving member (43) enters into the at least one slot (21), the collar (2) is operated by the second part (41) via the second driving member (43);

when unlocking the lock assembly from inside of the lock assembly, the first block (32) is moved toward the collar (2) to compress the inner spring (34), the push portion (321) of the first block (32) pushes the contact portion (432) of the second driving member (43) via the receiving hole (332) so that the outer spring (44) is compressed by the second driving member (43), the second driving member (43) moves to a position where the second lateral piece (432) is removed from the at least one first slot (21), the first driving member (33) is pushed by the inner spring (34) and the at least one first lateral piece (331) enters into the at least one slot (21) so that the collar (2) is operated by the first part (31) via the first driving member (33).

2. The lock assembly as claimed in claim 1, wherein the first part (31) includes at least one first slot (311) defined axially in a first end thereof, a first notch (312) is defined in a second end of the first part (31) and located corresponding to the at least one first lateral piece (331), the first block (32) includes a protrusion (322) which is slidably located in the at least one first slot (311), the at least one first lateral piece (331) is slidably located in the first notch (312), when the lock assembly is unlocked from the inside of the lock assembly, the at least one first lateral piece (331) is located corresponding to the at least one slot (21), the at least one first lateral piece (331) is located in the first notch (312) and the at least one slot (21).
3. The lock assembly as claimed in claim 1, wherein the second part (41) includes at least one second slot (411) defined axially in a first end thereof, a sec-

ond notch (412) is defined in a second end of the second part (41) and located corresponding to the at least one second lateral piece (431), the second block (42) includes a slide (421) which is slidably located in the second slot (411), the at least one first lateral piece (331) is slidably located in the second notch (412), when the lock assembly is unlocked from the outside of the lock assembly, the at least one second lateral piece (431) is located corresponding to the at least one slot (21), the second slot (412) is located corresponding to the at least one first lateral piece (331), the at least one second lateral piece (431) is located in the second notch (412) and the at least one slot (21).

4. The lock assembly as claimed in claim 1, wherein the first block (32) includes at least one first connection portion (323), the first driving member (33) includes at least one receiving hole (333) which is located corresponding to the at least one first connection portion (323), the inner spring (34) is connected between the at least one first connection portion (323) and the at least one receiving hole (333).
5. The lock assembly as claimed in claim 1, wherein the second block (42) includes at least one second connection portion (422), the second driving member (43) includes at least one connection member (433) which is located corresponding to the at least one second connection portion (422), the outer spring (44) is connected between the at least one second connection portion (422) and the at least one connection member (433).
6. The lock assembly as claimed in claim 1, wherein two cores (5) are received in the casing (1) and respectively located corresponding to the inner unit (3) and the outer unit (4), the core (5) that is located corresponding to an end of the outer unit (4) is located opposite to the collar (2), an end part (51) is located corresponding to each of the two cores (5) and includes a transmission plate (52) which is located off from an axis of the end part (51) and located on a curve path that the core (5) rotates, each of the first part (31) and the second part (41) includes a guide groove (521) in which the transmission plate (52) corresponding thereto is inserted.
7. The lock assembly as claimed in claim 6, wherein the end parts (51) each include a passage (53) and at least one insertion (54), each of the first and second blocks (32, 42) includes a connection portion (55) that is connected to the at least one insertion (54) corresponding thereto.
8. The lock assembly as claimed in claim 6, wherein the end part (51) and the transmission plate (52) are integrally formed to the core (5) corresponding there-

to.

9. The lock assembly as claimed in claim 7, wherein each of the end parts (51) include an extension member (56) located in the passage (53), each of the two cores (5) has a keyhole (57) and the extension member (56) is located corresponding to the keyhole (57), a key (6, 6') is inserted into the keyhole (57) to push the extension member (56), and the extension member (56) pushes the first block (32) or the second block (42).
10. The lock assembly as claimed in claim 7, wherein each of the casing (1) includes two receiving portions (11) which are respectively located corresponding to the first part (31) and the second part (41), the collar (2) is located between the two receiving portions (11), the casing (1) includes a through hole (12) that faces the second part (41), a first spring (13) and a first pin (14) are received in the through hole (12), the first pin (14) includes a neck (141), the casing (1) includes a positioning groove (15) which communicates with the through hole (12), a second spring (16) and a second pin (17) are received in the positioning groove (15), the second part (41) includes multiple radial holes (413) located corresponding to the first pin (14), the at least one insertion (54) and the second block (42), each radial hole (413) has an end piece (18) received therein which is supported by the at least one insertion (54) and the second block (42), when the lock assembly is unlocked, the first pin (14) is biased by the first spring (13) and contacts the end piece (18) or an outside of the second part (41), the second pin (17) is biased by the second spring (16) and contacts an outside of the first pin (14), when the lock assembly is locked, the end piece (18) is not supported by the at least one insertion (54) and the second block (42), and is disengaged from the radial hole (413), one of the radial holes (413) is located corresponding to the first pin (14) which is biased by the first spring (13) and is inserted into the radial hole (413) corresponding thereto, the neck (141) is located corresponding to the positioning groove (15), the second pin (17) is biased by the second spring (16) and engaged with the neck (141).

Patentansprüche

1. Verriegelungsanordnung, die umfasst:

ein Gehäuse (1), das einen Bund (2), der darin aufgenommen ist, umfasst, wobei der Bund (2) zwischen einer inneren Einheit (3) und einer äußeren Einheit (4) liegt, wobei der Bund (2) mindestens einen ersten Schlitz (21) aufweist, der axial in seiner inneren Peripherie definiert ist;

die innere Einheit (3) einen ersten Teil (31), einen ersten Block (32) und ein erstes Antriebselement (33) aufweist, wobei der erste Teil (31) den ersten Block (32) und das erste Antriebselement (33) antreibt, wobei der erste Block (32) einen Schiebeabschnitt (321) aufweist, das erste Antriebselement (33) mindestens ein erstes seitliches Teil (331) aufweist, das mit dem ersten Schlitz (21) übereinstimmend liegt, und ein Aufnahmeloch (332), das mit dem Schiebeabschnitt (321) übereinstimmend liegt, mindestens eine innere Feder (34), die zwischen dem ersten Block (32) und dem ersten Antriebselement (33) liegt;

wobei die äußere Einheit (4) einen zweiten Teil (41), einen zweiten Block (42) und ein zweites Antriebselement (43) aufweist, wobei der zweite Teil (41) den zweiten Block (42) und das zweite Antriebselement (43) antreibt, wobei das zweite Antriebselement (43) mindestens ein zweites seitliches Teil (431) aufweist, das mit dem ersten Schlitz (21) übereinstimmend liegt, und mindestens eine äußere Feder (44), die zwischen dem zweiten Block (42) und dem zweiten Antriebselement (43) liegt, **dadurch gekennzeichnet, dass** das zweite Antriebselement einen Kontaktabschnitt (432) aufweist, der mit dem Schiebeabschnitt (321) und mit dem mindestens einen Aufnahmeloch (332) übereinstimmend liegt; und

beim Entriegeln der Verriegelungsanordnung von außerhalb der Verriegelungsanordnung der zweite Block (42) zu dem Bund (2) bewegt wird, um die äußere Feder (44) derart zu komprimieren, dass das erste Antriebselement (33) axial geschoben wird, um die mindestens eine innere Feder (34) derart zu komprimieren, dass das erste Antriebselement (33) nicht in dem mindestens einen Schlitz (21) liegt, das zweite seitliche Teil (431) des zweiten Antriebselements (43) in den mindestens einen Schlitz (21) eintritt, der Bund (2) von dem zweiten Teil (41) über das zweite Antriebselement (43) betätigt wird;

beim Entriegeln der Verriegelungsanordnung von innerhalb der Verriegelungsanordnung der erste Block (32) zu dem Bund (2) bewegt wird, um die innere Feder (34) zu komprimieren, der Schiebeabschnitt (321) des ersten Blocks (32) den Kontaktabschnitt (432) des zweiten Antriebselements (43) über das Aufnahmeloch (332) derart schiebt, dass die äußere Feder (44) von dem zweiten Antriebselement (43) komprimiert wird, das zweite Antriebselement (43) sich zu einer Position bewegt, in der das zweite seitliche Teil (432) aus dem mindestens einen Schlitz (21) entfernt wird, das erste Antriebselement (33) von der inneren Feder (34) geschoben wird, und das mindestens eine erste seitliche Teil

- (331) in den mindestens einen Schlitz (21) derart eintritt, dass der Bund (2) von dem ersten Teil (31) über das erste Antriebselement (33) betätigt wird.
2. Verriegelungsanordnung nach Anspruch 1, wobei der erste Teil (31) mindestens einen ersten Schlitz (311) beinhaltet, der axial in einem ersten Ende davon definiert ist, eine erste Kerbe (312) in einem zweiten Ende des ersten Teils (31) definiert ist und mit dem mindestens einen ersten seitlichen Teil (331) übereinstimmend liegt, der erste Block (32) einen Vorsprung (322) beinhaltet, der gleitbar in dem mindestens einen ersten Schlitz (311) liegt, das mindestens eine erste seitliche Teil (331) gleitbar in der ersten Kerbe (312) liegt, wenn die Verriegelungsanordnung von der Innenseite der Verriegelungsanordnung entriegelt wird, das mindestens eine erste seitliche Teil (331) mit dem mindestens einen Schlitz (21) übereinstimmend liegt, das mindestens eine erste seitliche Teil (331) in der ersten Kerbe (312) und dem mindestens einen Schlitz (21) liegt.
 3. Verriegelungsanordnung nach Anspruch 1, wobei der zweite Teil (41) mindestens einen zweiten Schlitz (411) beinhaltet, der axial in einem ersten Ende davon definiert ist, eine zweite Kerbe (412) in einem zweiten Ende des zweiten Teils (41) definiert ist und mit dem mindestens einen zweiten seitlichen Teil (431) übereinstimmend liegt, der zweite Block (42) ein Gleitstück (421) beinhaltet, das gleitbar in dem mindestens einen zweiten Schlitz (411) liegt, das mindestens eine erste seitliche Teil (331) gleitbar in der zweiten Kerbe (412) liegt, wenn die Verriegelungsanordnung von der Außenseite der Verriegelungsanordnung entriegelt wird, das mindestens eine zweite seitliche Teil (431) mit dem mindestens einen Schlitz (21) übereinstimmend liegt, der zweite Schlitz (412) mit dem mindestens einen ersten seitlichen Teil (331) übereinstimmend liegt, das mindestens eine zweite seitliche Teil (431) in dem zweiten Schlitz (412) und dem mindestens einen Schlitz (21) liegt.
 4. Verriegelungsanordnung nach Anspruch 1, wobei der erste Block (32) mindestens einen ersten Verbindungsabschnitt (323) beinhaltet, das erste Antriebselement (33) mindestens ein Aufnahme Loch (333), das mit dem mindestens einen ersten Verbindungsabschnitt (323) übereinstimmend liegt, beinhaltet, die innere Feder (34) zwischen dem mindestens einen ersten Verbindungsabschnitt (323) und dem mindestens einen Aufnahme Loch (333) verbunden ist.
 5. Verriegelungsanordnung nach Anspruch 1, wobei der zweite Block (42) mindestens einen zweiten Verbindungsabschnitt (422) beinhaltet, das zweite An-
- triebselement (43) mindestens ein Verbindungselement (433), das mit dem mindestens einen zweiten Verbindungsabschnitt (422) übereinstimmend liegt, beinhaltet, die äußere Feder (44) zwischen dem mindestens einen Verbindungsabschnitt (422) und dem mindestens einen Verbindungselement (433) verbunden ist.
6. Verriegelungsanordnung nach Anspruch 1, wobei zwei Kerne (5) in dem Gehäuse (1) aufgenommen sind und jeweils der inneren Einheit (3) und der äußeren Einheit (4) entsprechend liegen, wobei der Kern (5), der mit einem Ende der äußeren Einheit (4) übereinstimmend liegt, dem Bund (2) entgegengesetzt liegt, ein Endteil (51) mit jedem der zwei Kerne (5) übereinstimmend liegt und eine Übertragungsplatte (52) beinhaltet, die von einer Achse des Endteils (51) beabstandet liegt und auf einer Kurvenbahn liegt, die der Kern (5) dreht, jeder des ersten Teils (31) und des zweiten Teils (41) eine Führungsnut (521), in der die Übertragungsplatte (52), die dem entspricht, eingefügt ist, beinhaltet.
 7. Verriegelungsanordnung nach Anspruch 6, wobei die Endteile (51) jeweils eine Passage (53) und mindestens eine Einfügung (54) beinhalten, jeder des ersten und des zweiten Blocks (32, 42) einen Verbindungsabschnitt (55) beinhaltet, der mit der mindestens einen Einfügung (54), die dem entspricht, verbunden ist.
 8. Verriegelungsanordnung nach Anspruch 6, wobei der Endteil (51) und die Übertragungsplatte (52) integral mit dem Kern (5), der dem entspricht, gebildet sind.
 9. Verriegelungsanordnung nach Anspruch 7, wobei jeder der Endteile (51) ein Erweiterungselement (56) beinhaltet, das in der Passage (53) liegt, jeder der zwei Kerne (5) ein Schlüsselloch (57) aufweist, und das Erweiterungselement (56) mit dem Schlüsselloch (57) übereinstimmend liegt, ein Schlüssel (6, 6') in das Schlüsselloch (57) eingefügt wird, um das Erweiterungselement (56) zu schieben, und das Erweiterungselement (56) den ersten Block (32) oder den zweiten Block (42) schiebt.
 10. Verriegelungsanordnung nach Anspruch 7, wobei jedes des Gehäuses (1) zwei Aufnahmeabschnitte (11) beinhaltet, die jeweils dem ersten Teil (31) und dem zweiten Teil (41) entsprechend liegen, der Bund (2) zwischen den zwei Aufnahmeabschnitten (11) liegt, das Gehäuse (1) ein durchgehendes Loch (12) beinhaltet, das dem zweiten Teil (41) zugewandt ist, eine erste Feder (13) und ein erster Stift (14) in dem durchgehenden Loch (12) aufgenommen sind, der erste Stift (14) einen Hals (141) beinhaltet, das Gehäuse (1) eine Positionierungsnut (15) beinhaltet,

die mit dem durchgehenden Loch (12) in Verbindung steht, eine zweite Feder (16) und ein zweiter Stift (17) in der Positionierungsnut (15) aufgenommen sind, der zweite Teil (41) mehrere radiale Löcher (413) beinhaltet, die dem ersten Stift (14), der mindestens einen Einfügung (54) und dem zweiten Block (42) entsprechend liegen, jedes radiale Loch (413) ein Endstück (18), das darin aufgenommen ist, aufweist, das von der mindestens einen Einfügung (54) und dem zweiten Block (42) getragen wird, wenn die Verriegelungsanordnung entriegelt wird, der erste Stift (14) von der ersten Feder (13) vorgespannt wird und das Endstück (18) oder eine Außenseite des zweiten Teils (41) kontaktiert, der zweite Stift (17) von der zweiten Feder (16) vorgespannt wird und eine Außenseite des ersten Stifts (14) kontaktiert, wenn die Verriegelungsanordnung verriegelt wird, das Endstück (18) nicht von der mindestens einen Einfügung (54) und dem zweiten Block (42) getragen wird und aus dem radialen Loch (413) ausgerückt wird, eines der radialen Löcher (413) mit dem ersten Stift (14) übereinstimmend liegt, der von der ersten Feder (13) vorgespannt wird und in das radiale Loch (413), das dem entspricht, eingefügt wird, der Hals (141) mit der Positionierungsnut (15) übereinstimmend liegt, der zweite Stift (17) von der zweiten Feder (16) vorgespannt und in den Hals (141) eingerückt wird.

Revendications

1. Ensemble de verrou comprenant :

un boîtier (1) dans lequel est reçu un collier (2), le collier (2) étant situé entre une unité intérieure (3) et une unité extérieure (4), le collier (2) ayant au moins une première fente (21) définie axialement dans une périphérie intérieure de celui-ci ;
l'unité intérieure (3) ayant une première partie (31), un premier bloc (32) et un premier élément d'entraînement (33), la première partie (31) entraînant le premier bloc (32) et le premier élément d'entraînement (33), le premier bloc (32) ayant une portion de poussée (321), le premier élément d'entraînement (33) ayant au moins une première pièce latérale (331) qui est située en correspondance avec la première fente (21), et un trou de réception (332) qui est situé en correspondance avec la portion de poussée (321), au moins un ressort intérieur (34) situé entre le premier bloc (32) et le premier élément d'entraînement (33) ; l'unité extérieure (4) ayant une deuxième partie (41), un deuxième bloc (42) et un deuxième élément d'entraînement (43), la deuxième partie (41) entraînant le deuxième bloc (42) et le deuxième élément d'entraînement

(43), le deuxième élément d'entraînement (43) ayant au moins une deuxième pièce latérale (431) qui est située en correspondance avec la première fente (21), et
au moins un ressort extérieur (44) situé entre le deuxième bloc (42) et le deuxième élément d'entraînement (43) **caractérisé en ce que**
le deuxième élément d'entraînement a une portion de contact (432) qui est située en correspondance avec la portion de poussée (321) et l'au moins un trou de réception (332) ; et
lors du déverrouillage de l'ensemble de verrou depuis l'extérieur de l'ensemble de verrou, le deuxième bloc (42) est déplacé vers le collier (2) pour comprimer le ressort extérieur (44) de manière à pousser axialement le premier élément d'entraînement (33) pour comprimer l'au moins un ressort intérieur (34) de sorte que le premier élément d'entraînement (33) ne soit pas situé dans l'au moins une fente (21), la deuxième pièce latérale (431) du deuxième élément d'entraînement (43) entre dans l'au moins une fente (21), le collier (2) est actionné par la deuxième partie (41) via le deuxième élément d'entraînement (43) ; lors du déverrouillage de l'ensemble de verrou depuis l'intérieur de l'ensemble de verrou, le premier bloc (32) est déplacé vers le collier (2) pour comprimer le ressort intérieur (34), la portion de poussée (321) du premier bloc (32) pousse la portion de contact (432) du deuxième élément d'entraînement (43) via le trou de réception (332) de sorte que le ressort extérieur (44) soit comprimé par le deuxième élément d'entraînement (43), le deuxième élément d'entraînement (43) se déplace vers une position où la deuxième pièce latérale (432) est retirée de l'au moins une première fente (21), le premier élément d'entraînement (33) est poussé par le ressort intérieur (34) et l'au moins une première pièce latérale (331) entre dans l'au moins une fente (21) de sorte que le collier (2) soit actionné par la première partie (31) via le premier élément d'entraînement (33).

2. Ensemble de verrou selon la revendication 1, dans lequel la première partie (31) comporte au moins une première fente (311) définie axialement dans une première extrémité de celle-ci, une première encoche (312) est définie dans une deuxième extrémité de la première partie (31) et située en correspondance avec l'au moins une première pièce latérale (331), le premier bloc (32) comporte une saillie (322) qui est située de manière coulissante dans l'au moins une première fente (311), l'au moins une première pièce latérale (331) est située de manière coulissante dans la première encoche (312), lorsque l'ensemble de verrou est déverrouillé depuis l'inté-

- rieur de l'ensemble de verrou, l'au moins une première pièce latérale (331) est située en correspondance avec l'au moins une fente (21), l'au moins une première pièce latérale (331) est située dans la première encoche (312) et l'au moins une fente (21). 5
3. Ensemble de verrou selon la revendication 1, dans lequel la deuxième partie (41) comporte au moins une deuxième fente (411) définie axialement dans une première extrémité de celle-ci, une deuxième encoche (412) est définie dans une deuxième extrémité de la deuxième partie (41) et située en correspondance avec l'au moins une deuxième pièce latérale (431), le deuxième bloc (42) comporte un coulisseau (421) qui est situé de manière coulissante dans la deuxième fente (411), l'au moins une première pièce latérale (331) est située de manière coulissante dans la deuxième encoche (412), lorsque l'ensemble de verrou est déverrouillé depuis l'extérieur de l'ensemble de verrou, l'au moins une deuxième pièce latérale (431) est située en correspondance avec l'au moins une fente (21), la deuxième fente (412) est située en correspondance avec l'au moins une première pièce latérale (331), l'au moins une deuxième pièce latérale (431) est située dans la deuxième encoche (412) et l'au moins une fente (21). 10
4. Ensemble de verrou selon la revendication 1, dans lequel le premier bloc (32) comporte au moins une première portion de connexion (323), le premier élément d'entraînement (33) comporte au moins un trou de réception (333) qui est situé en correspondance avec l'au moins une première portion de connexion (323), le ressort intérieur (34) est connecté entre l'au moins une première portion de connexion (323) et l'au moins un trou de réception (333). 15
5. Ensemble de verrou selon la revendication 1, dans lequel le deuxième bloc (42) comporte au moins une deuxième portion de connexion (422), le deuxième élément d'entraînement (43) comporte au moins un élément de connexion (433) qui est situé en correspondance avec l'au moins une deuxième portion de connexion (422), le ressort extérieur (44) est connecté entre l'au moins une deuxième portion de connexion (422) et l'au moins un élément de connexion (433). 20
6. Ensemble de verrou selon la revendication 1, dans lequel deux noyaux (5) sont reçus dans le boîtier (1) et situés respectivement en correspondance avec l'unité intérieure (3) et l'unité extérieure (4), le noyau (5) qui est situé en correspondance avec une extrémité de l'unité extérieure (4) est situé à l'opposé du collier (2), une partie d'extrémité (51) est située en correspondance avec chacun des deux noyaux (5) et comporte une plaque de transmission (52) qui est 25
- située hors d'un axe de la partie d'extrémité (51) et située sur un chemin courbe que le noyau (5) fait tourner, chacune parmi la première partie (31) et la deuxième partie (41) comporte une rainure de guidage (521) dans laquelle la plaque de transmission (52) qui lui correspond est insérée. 30
7. Ensemble de verrou selon la revendication 6, dans lequel les parties d'extrémité (51) comportent chacune un passage (53) et au moins une insertion (54), chacun des premier et deuxième blocs (32, 42) comporte une portion de connexion (55) qui est connectée à l'au moins une insertion (54) qui lui correspond. 35
8. Ensemble de verrou selon la revendication 6, dans lequel la partie d'extrémité (51) et la plaque de transmission (52) sont formées d'un seul tenant par rapport au noyau (5) qui leur correspond. 40
9. Ensemble de verrou selon la revendication 7, dans lequel chacune des parties d'extrémité (51) comporte un élément d'extension (56) situé dans le passage (53), chacun des deux noyaux (5) a un trou de serrure (57) et l'élément d'extension (56) est situé en correspondance avec le trou de serrure (57), une clé (6, 6') est insérée dans le trou de serrure (57) pour pousser l'élément d'extension (56), et l'élément d'extension (56) pousse le premier bloc (32) ou le deuxième bloc (42). 45
10. Ensemble de verrou selon la revendication 7, dans lequel chacun des boîtiers (1) comporte deux portions de réception (11) qui sont situées respectivement en correspondance avec la première partie (31) et la deuxième partie (41), le collier (2) est situé entre les deux portions de réception (11), le boîtier (1) comporte un trou traversant (12) qui fait face à la deuxième partie (41), un premier ressort (13) et une première broche (14) sont reçus dans le trou traversant (12), la première broche (14) comporte un col (141), le boîtier (1) comporte une rainure de positionnement (15) qui communique avec le trou traversant (12), un deuxième ressort (16) et une deuxième broche (17) sont reçus dans la rainure de positionnement (15), la deuxième partie (41) comporte de multiples trous radiaux (413) situés en correspondance avec la première broche (14), l'au moins une insertion (54) et le deuxième bloc (42), chaque trou radial (413) a une pièce d'extrémité (18) reçue dans celui-ci qui est supportée par l'au moins une insertion (54) et le deuxième bloc (42), lorsque l'ensemble de verrou est déverrouillé, la première broche (14) est sollicitée par le premier ressort (13) et entre en contact avec la pièce d'extrémité (18) ou un extérieur de la deuxième partie (41), la deuxième broche (17) est sollicitée par le deuxième ressort (16) et entre en contact avec un extérieur de la première broche (14), lorsque l'ensemble de verrou est ver- 50

rouillé, la pièce d'extrémité (18) n'est pas supportée par l'au moins une insertion (54) et le deuxième bloc (42), et se dégage du trou radial (413), l'un des trous radiaux (413) est situé en correspondance avec la première broche (14) qui est sollicitée par le premier ressort (13) et qui est insérée dans le trou radial (413) qui lui correspond, le col (141) est situé en correspondance avec la rainure de positionnement (15), la deuxième broche (17) est sollicitée par le deuxième ressort (16) et se met en prise avec le col (141).

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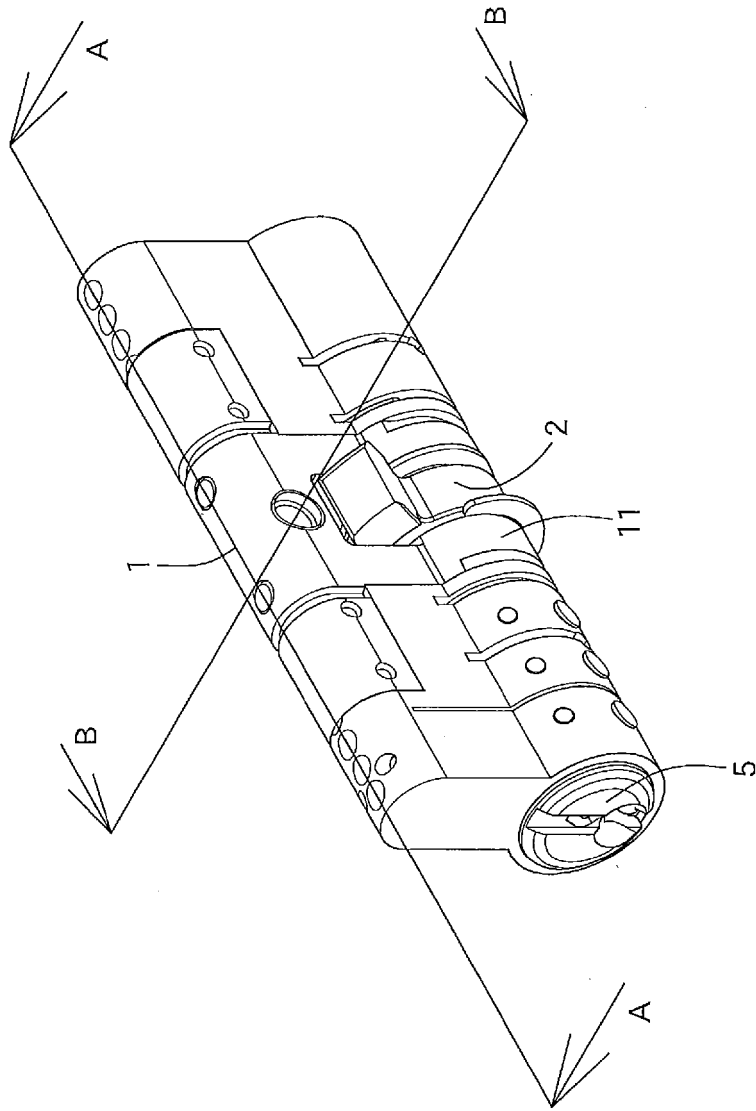


FIG.1

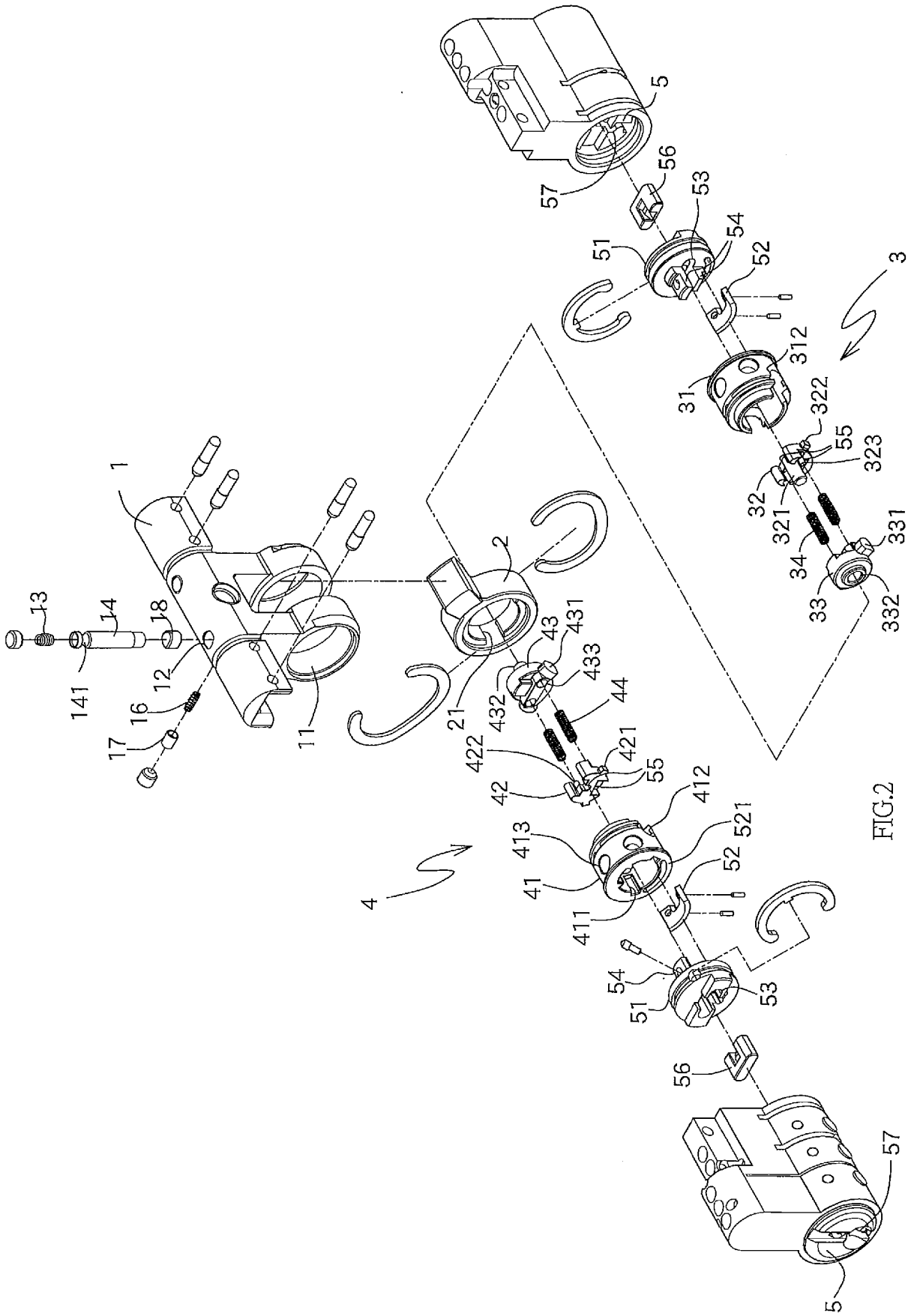


FIG.2

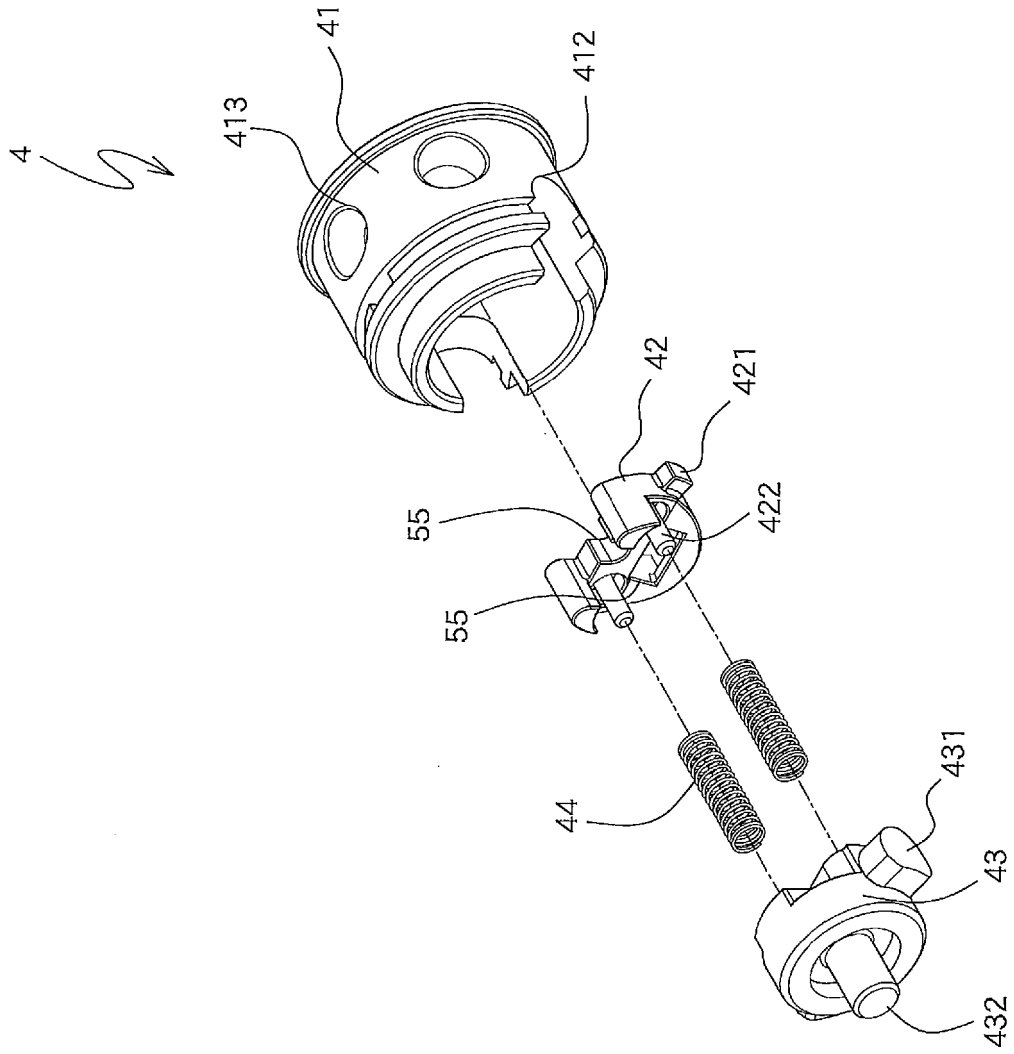


FIG.3

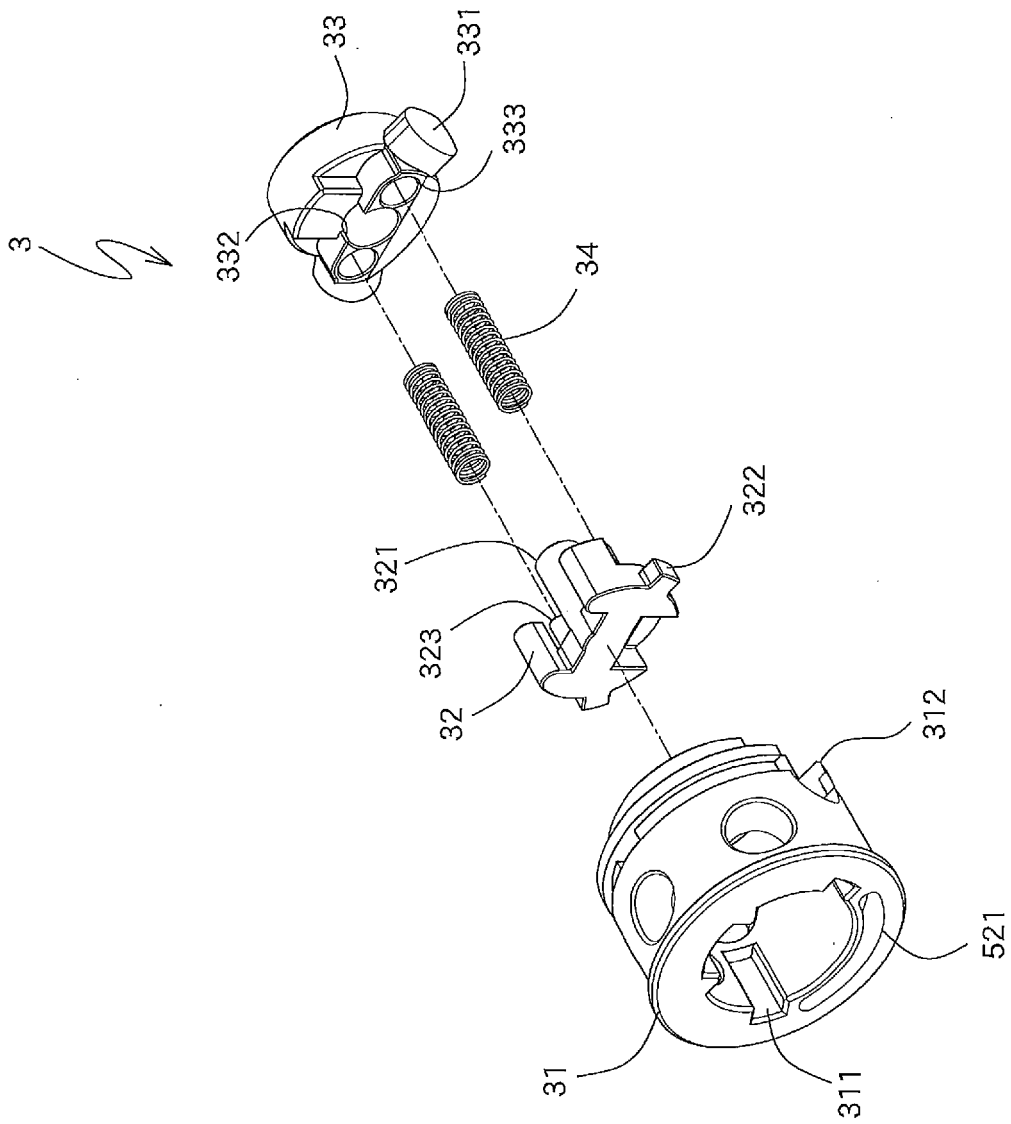


FIG.4

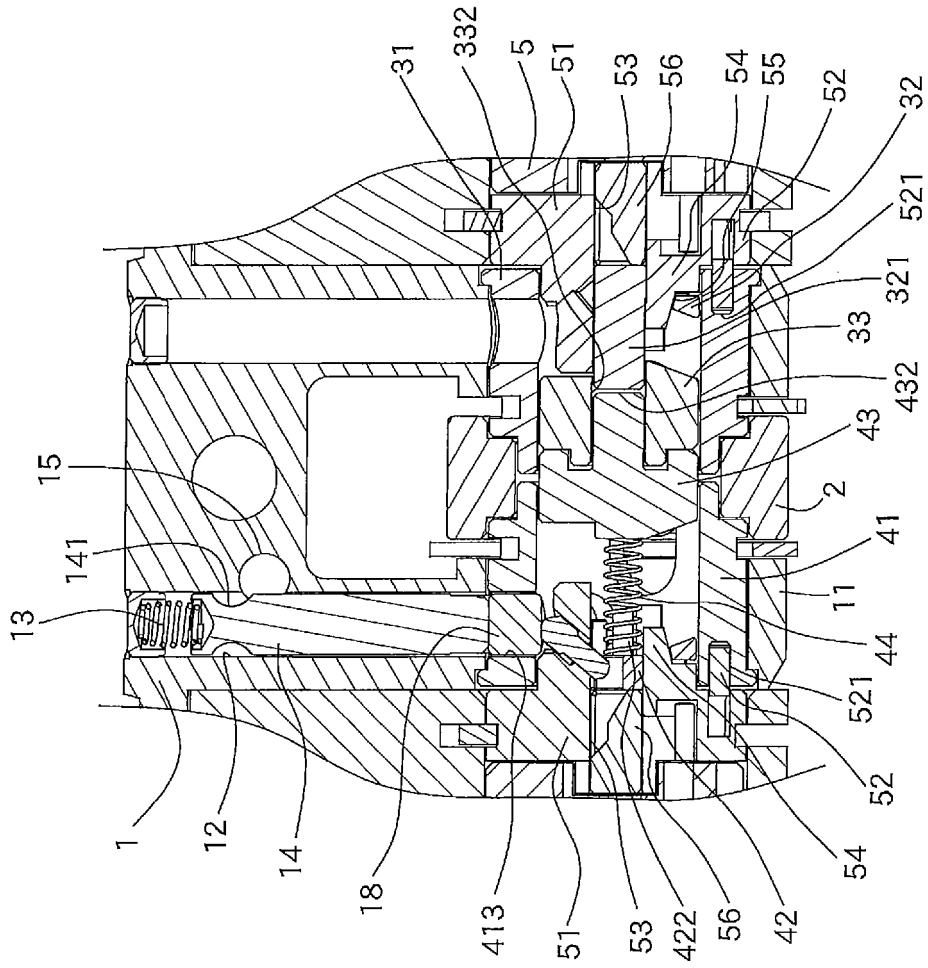


FIG.5

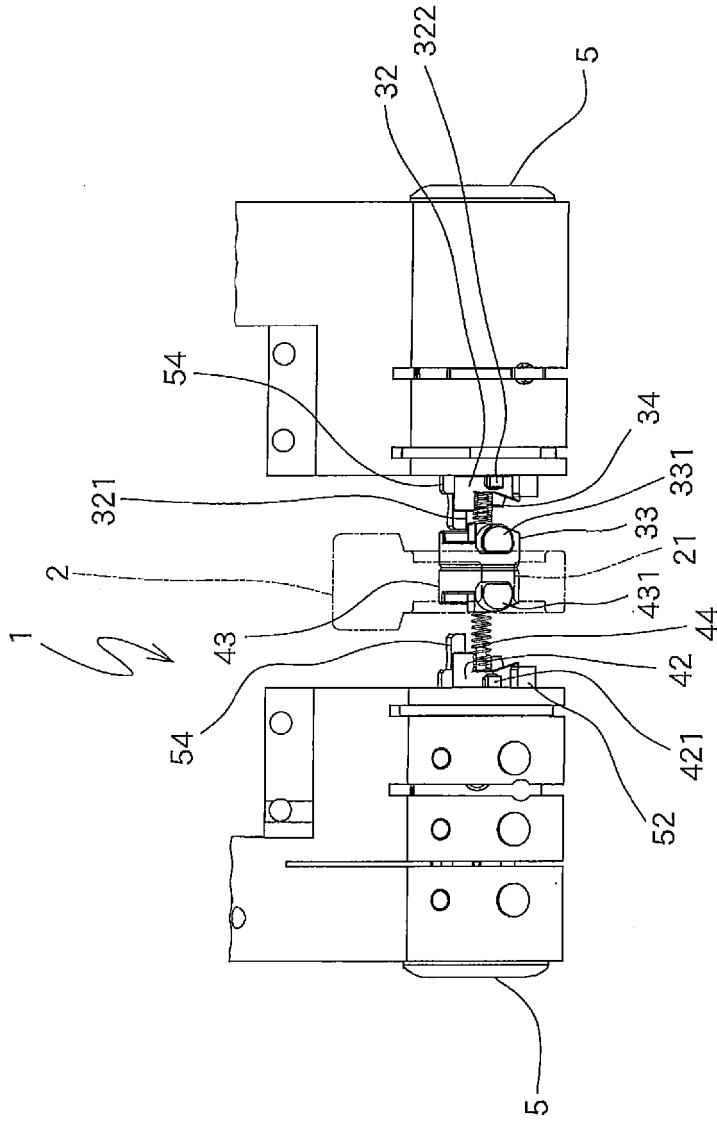


FIG.6

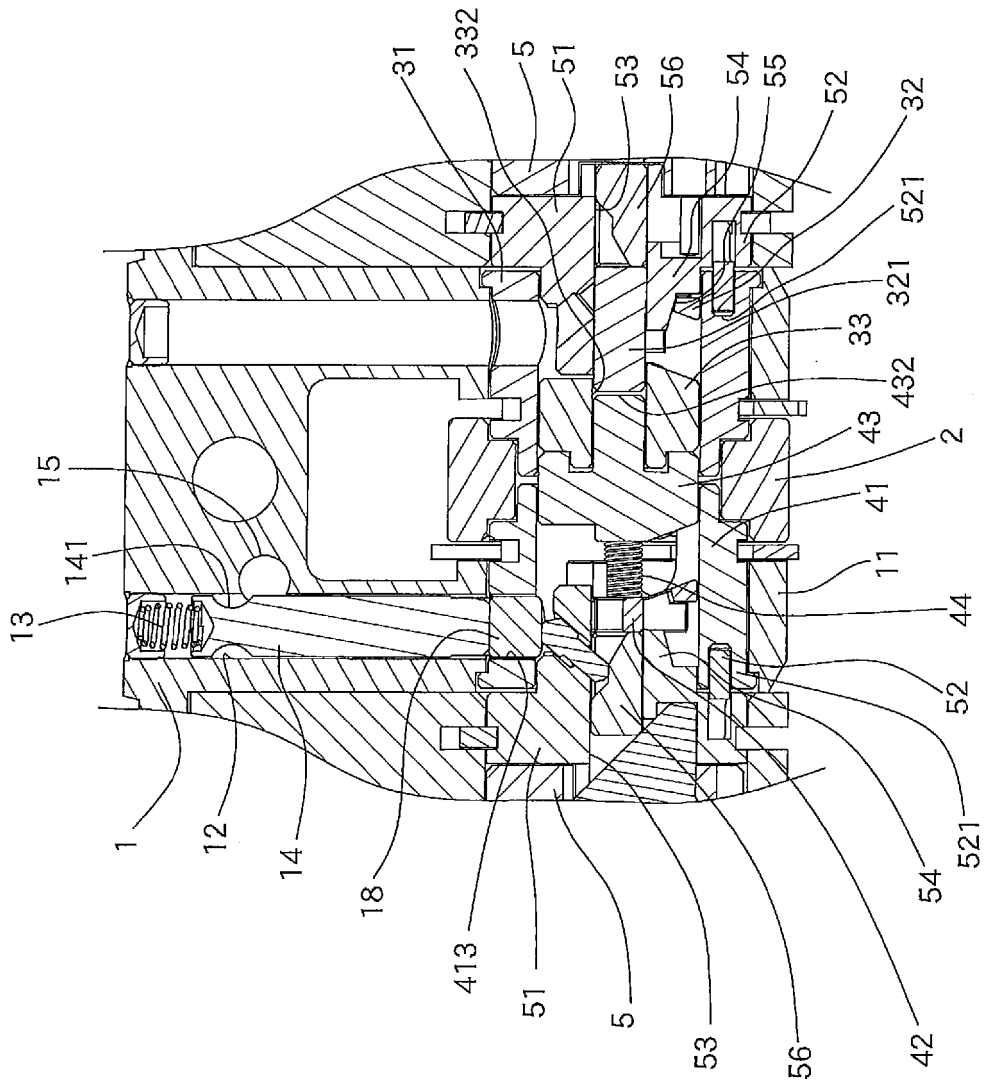


FIG.7

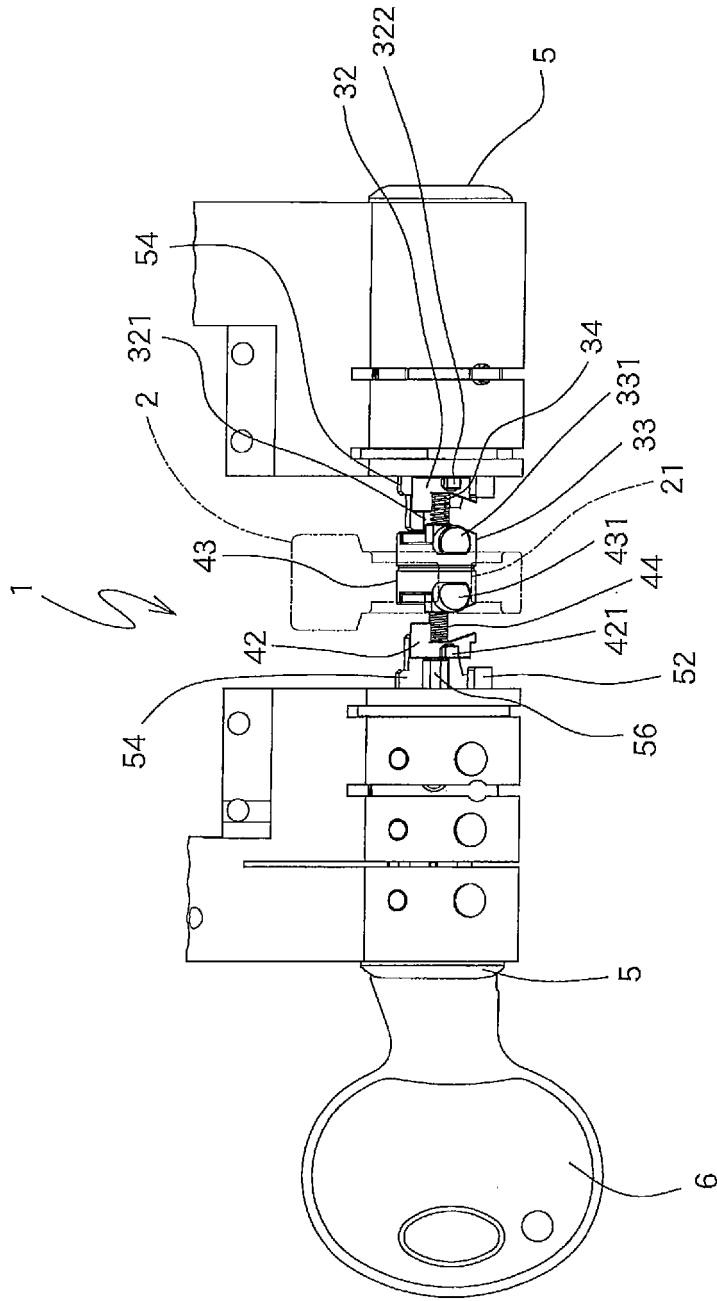


FIG. 8

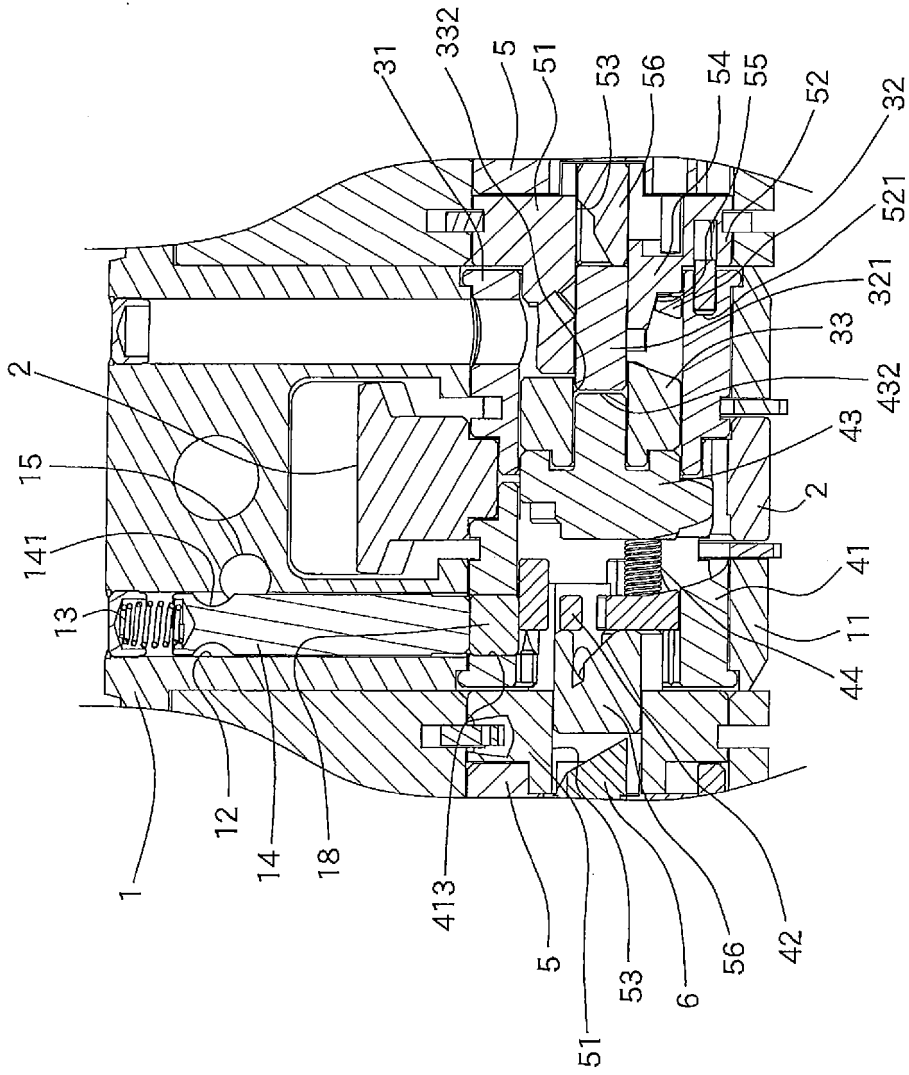


FIG.9

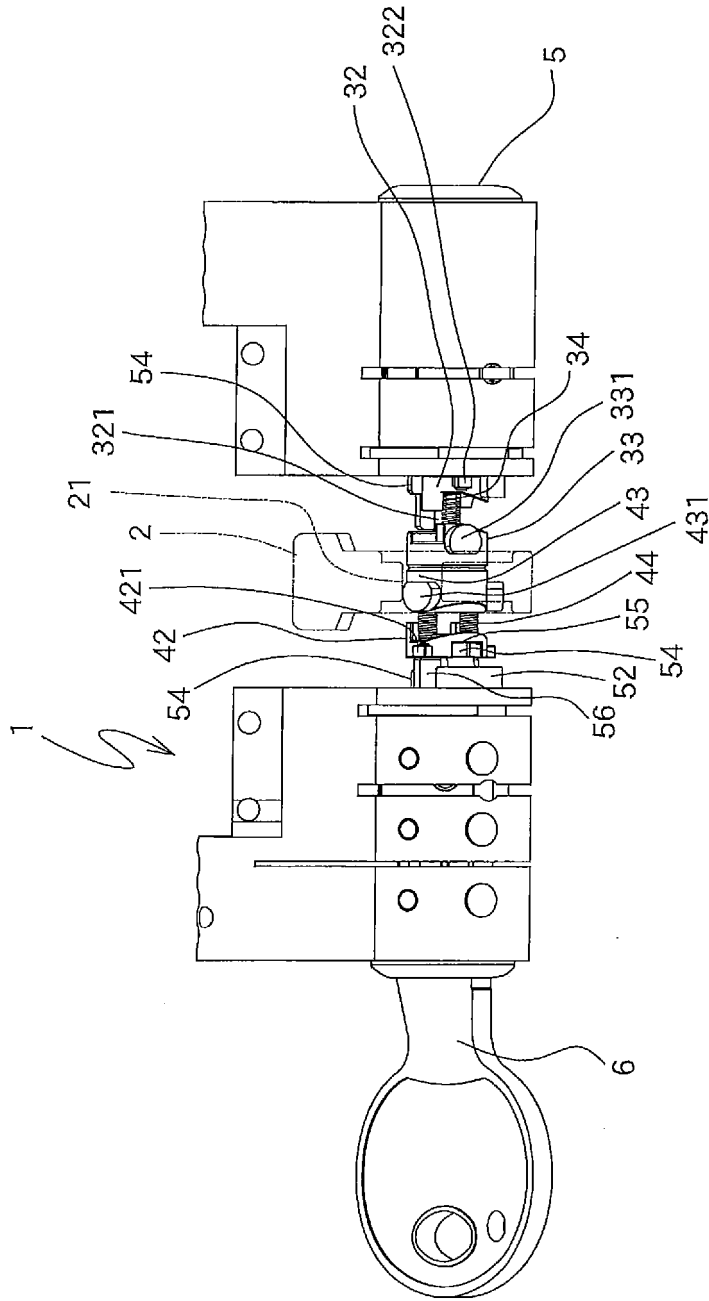


FIG.10

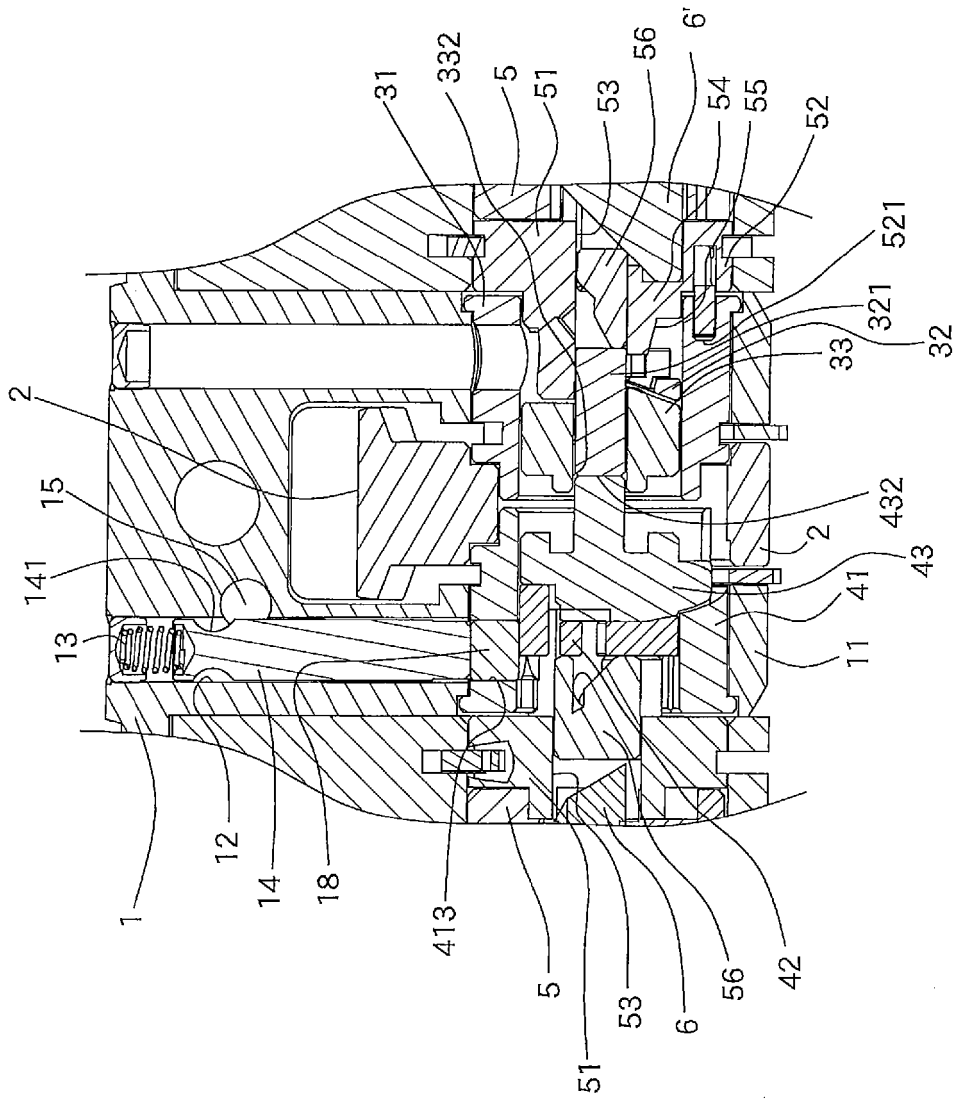


FIG.11

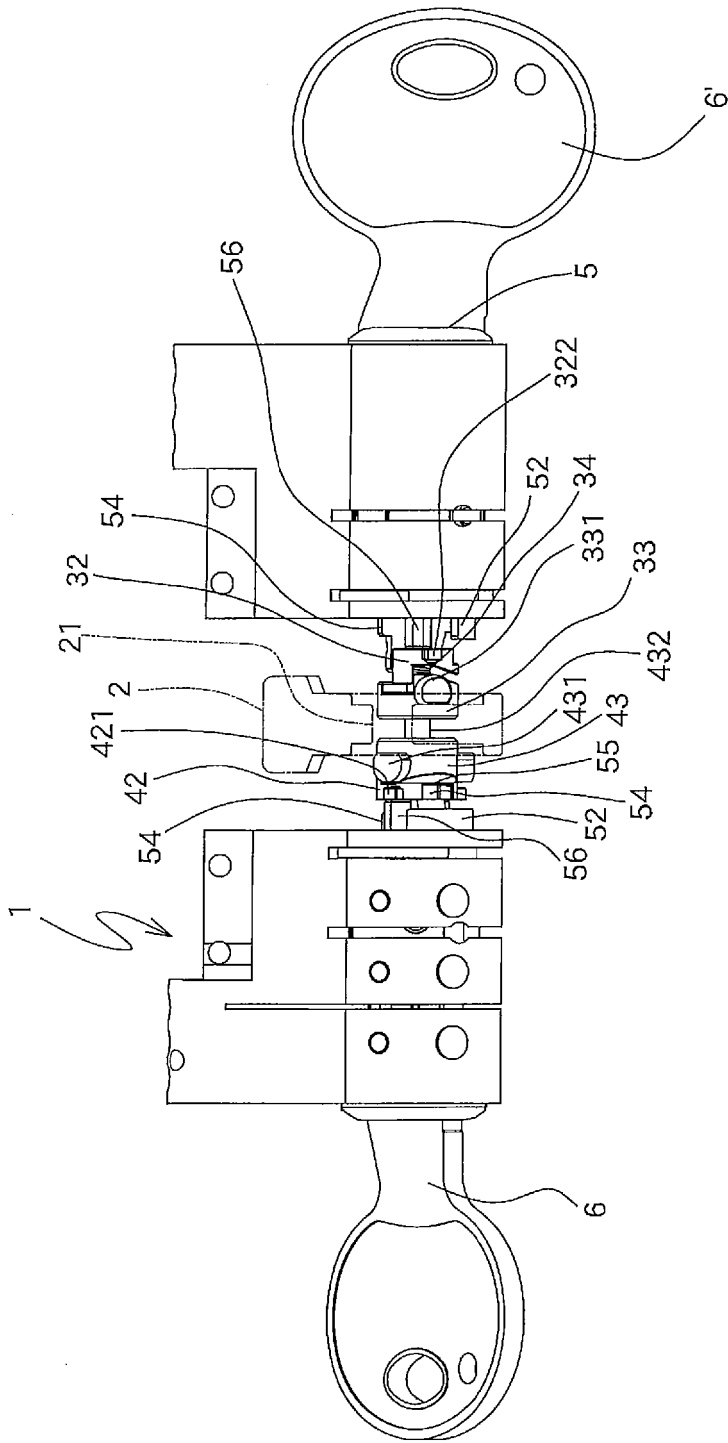


FIG.12

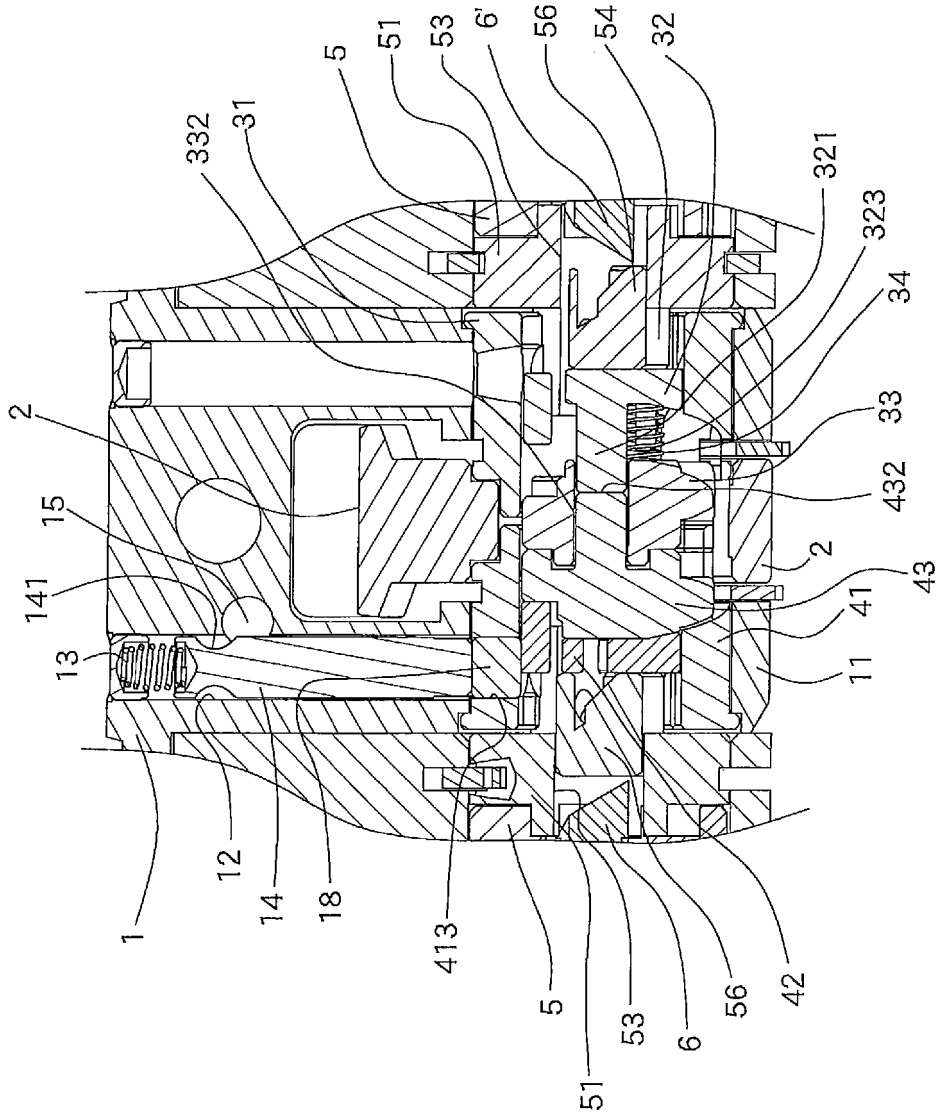


FIG.13

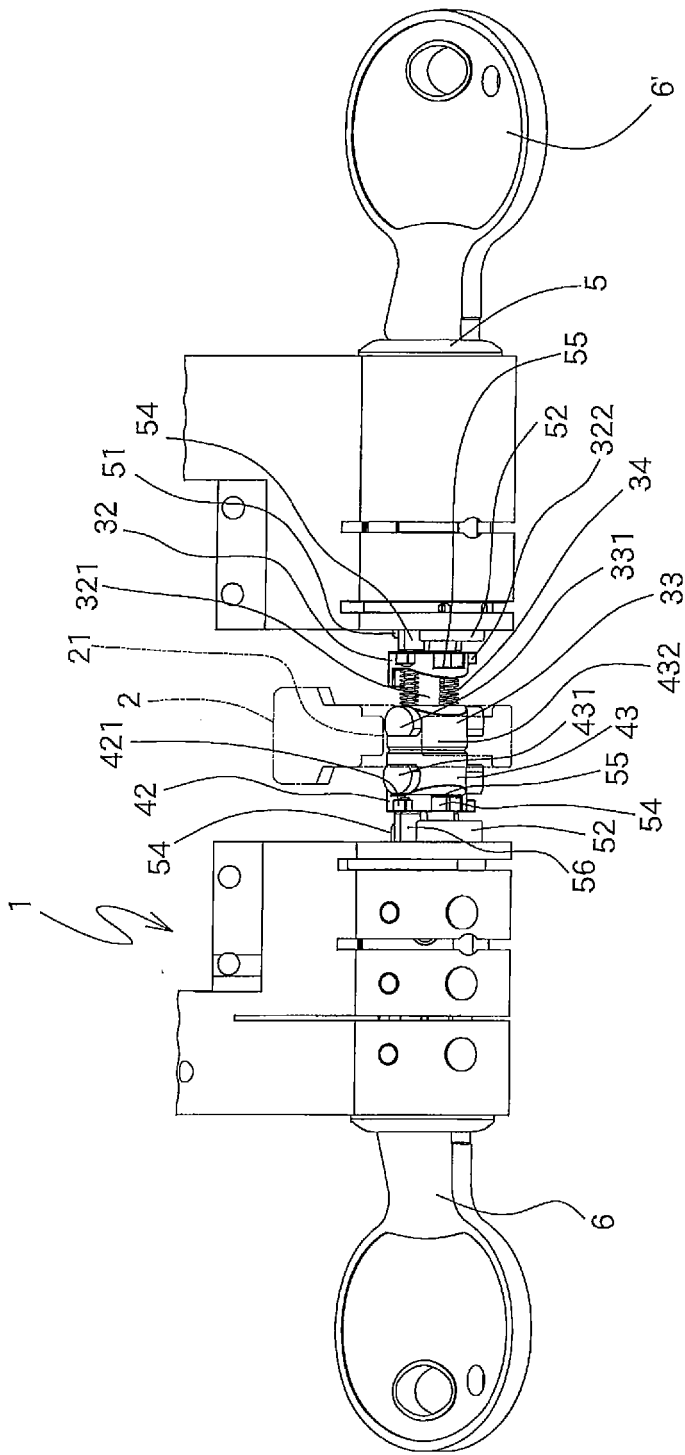


FIG.14

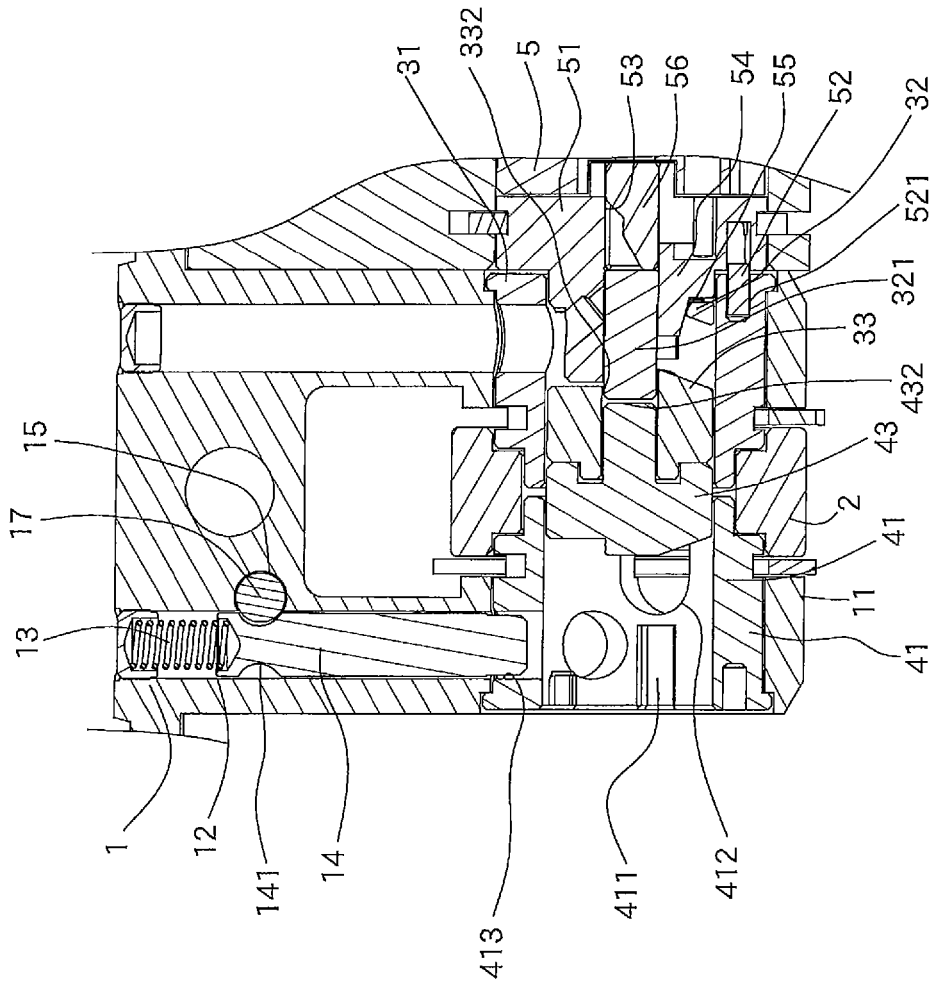
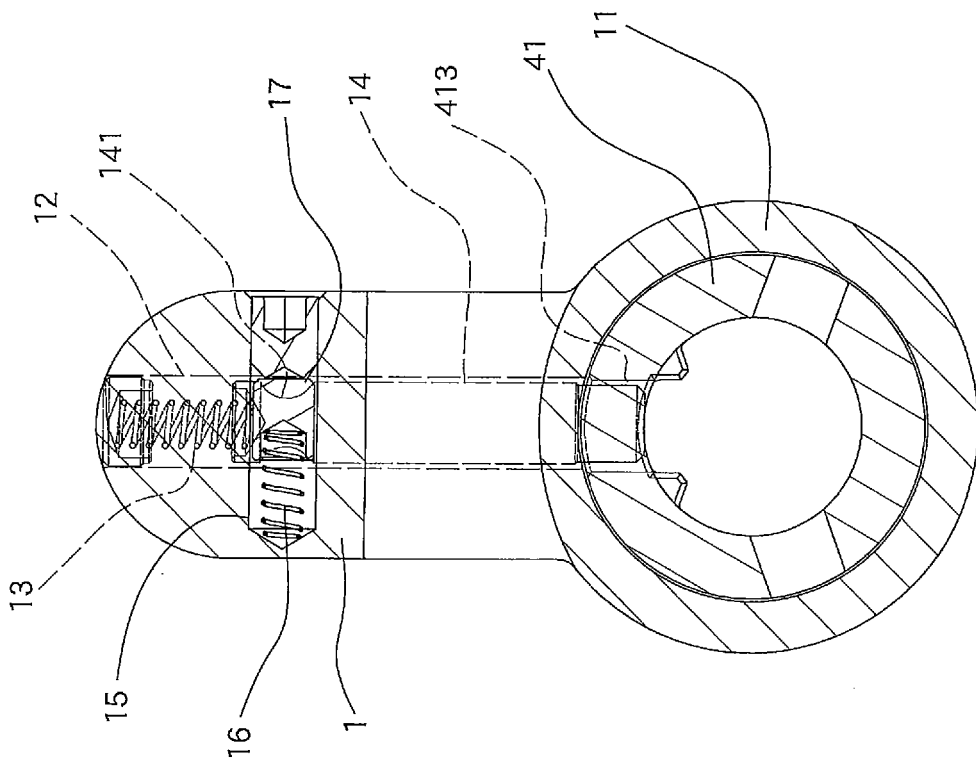


FIG.15



REFERENCES CITED IN THE DESCRIPTION

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