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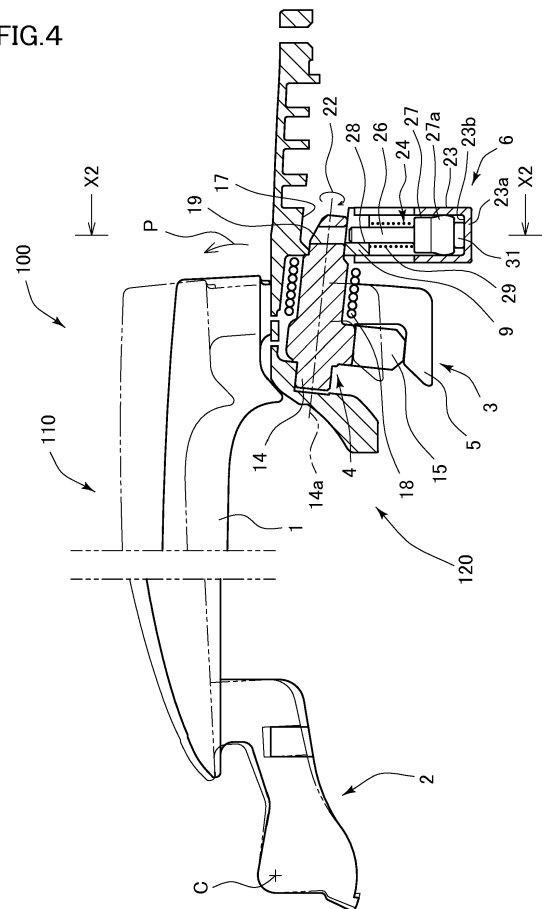
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(54) **Vehicular door handle device**

(57) A lock pin 24 which can be fitted toward a pin-fitting hole 19 (lock pin hole) formed in a shaft 14 (restriction member) of a bell crank 4 is disposed in the turn-motion guide 6 (operation guide) of a base member 120. The base member 120 is provided with a case body 23 (cover body) which covers the base end 27 of the lock pin 24 from outside and which slidably supports the base end 27. A soft body 31 (cushion material) is interposed between the base end 27 of the lock pin 24 and a bottom 23b of the case body 23 opposed to the base end 27 in a state where the soft body 31 is fixed to the base end 27 of the lock pin 24. When the lock pin 24 is disposed at a normal position, the base end 27 of the lock pin 24 is supported by the bottom 23b of the case body 23 through the soft body 31.

The invention provides a vehicular door handle device capable of preventing hammering sound from being generated by collision between a lock pin and a cover body.

FIG.4



Description

BACKGROUND OF THE INVENTION

[Technical Field]

[0001] The invention relates to a vehicular door handle device, and more particularly, to a vehicular door handle device configured such that a door is prevented from being unlocked even if a load is applied to the door from a side surface of a vehicle or from a diagonal direction due to a side collision or the like.

[Background Art]

[0002] As described in JP 4671296 B1, a vehicular door handle device of this kind includes a base member fixed to a door of a vehicle, and a handle whose opening operation in a pull-up direction and a closing operation in an opposite direction are guided by an operation guide formed on the base member in a guide arm extending from a free end which is one end. The other end of the guide arm is a fulcrum arm. More specifically, the operation guide of the base member is provided with a restriction member which is connected to the guide arm of the handle at the operation guide of the base member, which turns around an axis intersecting with the pull-up direction of the handle when the handle is pulled up, and which restricts the opening operation of the handle. A lock pin hole is formed in the restriction member in a direction intersecting with an axis of the lock pin hole and in a phase corresponding to an initial opening operation of the handle whose door is not unlocked. The lock pin hole opens toward the door.

A lock pin is disposed on the base member. The lock pin is biased by a spring member to a normal position that is normally disengaged from the lock pin hole in a state where the lock pin can be fitted into and disengaged from the lock pin hole of the restriction member in an initial stage of the opening operation of the handle. When an impact load with respect to the door exceeding the biasing force of the spring member is generated, if a tip end of the lock pin is relatively fitted into the lock pin hole by inertia, the door is prevented from being unlocked through the restriction member whose turning motion around the axis is restricted. The base member is provided with a pin guide which slidably supports a tip end of the lock pin, and with a cover body which covers a base end of the lock pin from outside and which slidably supports the base end of the lock pin.

SUMMARY OF THE INVENTION

[Problems to be Solved by the Invention]

[0003] However, if sensitivity (response) of the lock pin is set high, the lock pin repeats minute or fine reciprocating motion in the cover body in some cases when the

door is closed strongly, and hammering sound (chattering noise) may be generated by collision against the cover body.

[0004] The invention has been accomplished to solve this problem, and it is an object of the invention to provide a vehicular door handle device capable of preventing hammering sound from being generated by collision between the lock pin and the cover body.

[Means for Solving Problems and Effects of the Invention]

[0005] To achieve the above object, the invention provides a vehicular door handle device mounted on a door of a vehicle for carrying out an opening operation to unlock the door, comprising a base member fixed to the door of the vehicle and a handle in which a fulcrum arm connected to a turning fulcrum of the base member is formed on one end of the handle, and a guide arm connected to an operation guide formed on the base member is formed on a free end which is the other end of the handle, wherein:

the operation guide is provided with a restriction member which includes a shaft connected to the guide arm of the handle and configured to turn around an axis intersecting with a pull-up direction of the handle when the handle is pulled up, and a pair of lever bodies, one of which abuts against a locking part of the guide arm when the handle is pulled up and the other of which stops turning motion of the one lever body in tandem with a lock device; a lock pin hole is formed in the shaft and opens toward the door in a direction intersecting with the axis and in a phase corresponding to an initial opening operation of the handle whose door is not unlocked; a case body is disposed in the base member so as to face the lock pin hole, and a lock pin is disposed in the case body;

the lock pin includes a pin portion which is guided by a pin-guide groove formed in the base member and which is fitted into the lock pin hole, and a base end has a predetermined weight;

a spring member biased to a position where the lock pin is disengaged from the lock pin hole is disposed between the pin-guide groove and the base end; when an impact load exceeding a biasing force of the spring member is generated with respect to the door, the pin portion is relatively fitted into the lock pin hole by inertia of the lock pin, turning motion of the shaft around its axis is restricted to prevent the door from being unlocked;

a through hole for operation check of the lock pin is formed in a bottom of the case body, and a soft body having a size capable of closing the through hole of the bottom is interposed between the bottom and the through hole or the base end; and

the soft body seals the through hole, and when the lock pin is moved toward the bottom by the spring

member, the soft body stops vibration of the lock pin and hammering sound generated by the vibration.

[0006] According to the vehicular door handle device of the invention, the soft body is interposed between the base end of the lock pin and the bottom of the case body opposed to the base end in a state where the soft body is fixed to either the base end of the lock pin or the bottom of the case body. When the lock pin is disposed at the position, the base end of the lock pin is supported by the bottom of the case body through the soft body.

[0007] Hence, even if the lock pin collides against the bottom of the case body when the door is closed strongly, since the lock pin collides against the case body through the soft body, it is possible to excellently prevent hammering sound (chattering sound) from being generated.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

Fig. 1 shows a reference example of the invention, and is a perspective view of a vehicular door handle device as viewed from its bottom;

Fig. 2 is a bottom view of Fig. 1;

Fig. 3 is a side view when a handle and a base member shown in Fig. 1 are separated from each other;

Fig. 4 is a sectional view taken along line X1-X1 in Fig. 2;

Fig. 5 is a sectional view taken along line X2-X2 in Fig. 4;

Fig. 6A is a vertical sectional view of essential portions of a lock pin and a case body shown in Fig. 5;

Fig. 6B is a lateral sectional view taken along line Y1-Y1 in Fig. 5;

Fig. 7 is an explanatory diagram of an operation of the lock pin when a load F is applied;

Fig. 8 is a sectional view taken along line Z-Z in Fig. 7;

Fig. 9 shows Example 1 of the invention, and is a sectional view corresponding to Fig. 7;

Fig. 10 shows Example 2 of the invention, and is a sectional view corresponding to Fig. 7;

Fig. 11 is an explanatory diagram showing a mounting process of a soft body shown in Fig. 10; and

Fig. 12 shows Example 3 of the invention, and is a sectional view corresponding to Fig. 7.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0009] An embodiment of the invention will be described below using the drawings.

[0010] As shown in Figs. 1 and 2, a vehicular door handle device 100 includes a handle 110 and a base member 120. As shown in Fig. 3, according to the vehicular door handle device 100, if the handle 110 is inserted into the base member 120, the handle 110 and the base member 120 are

integrally attached to each other.

[0011] First, the handle 110 will be described. The handle 110 includes a handle body 1 extending in a longitudinal direction of a vehicle, a fulcrum arm 2 projecting from an end of a front surface (front side) of the vehicle in the handle body 1, and a guide arm 3 projecting from an end of a rear surface (rear side) of the vehicle.

[0012] The handle body 1 has an entirely smooth curved surface so as to provide a good grip feeling. The handle body 1 is made of one or more kinds of resins such as polycarbonate-based resin, polybutylene terephthalate-based resin and nylon-based resin. The fulcrum arm 2 extends from a front bottom surface 1a in the handle body 1. The handle body 1 is turned in a form of an arc around a turning fulcrum C formed on a front end of the fulcrum arm 2 when the handle body 1 is attached to the base member 120.

[0013] The guide arm 3 extends from a rear bottom surface 1b in the handle body 1. A tip end of the guide arm 3 is bent forward, and a locking part 5 which is locked to a bell crank 4 (see Fig. 2) of the base member 120 is formed on the bent portion. A lower end of the guide arm 3 is provided with a pair of protrusions 8 protruding from wall surfaces of both sides of the guide arm 3. The protrusions 8 are guided by a guide wall 7 projecting from a bottom surface of a later-described turn-motion guide 6 of the base member 120.

[0014] Next, the base member 120 will be described. A body 9 of the base member 120 has an arched shape, and a turning fulcrum 11 for connecting the fulcrum arm 2 of the handle 110 is formed on a front portion of the body 9. Similarly, a turn-motion guide 6 for connecting the guide arm 3 of the handle 110 is formed on a rear portion of the body 9. The turning fulcrum 11 of the base member 120 is provided with a front opening 12 into which the fulcrum arm 2 of the handle 110 is to be inserted, and the turn-motion guide 6 is provided with a rear opening 13 into which the guide arm 3 of the handle 110 is to be inserted.

[0015] As shown in Figs. 1, 2 and 4, the bell crank 4 (restriction member) for restricting the handle 110 from being turned in a pull-up direction is mounted on the turn-motion guide 6. The bell crank 4 includes a shaft 14 mounted on the turn-motion guide 6 of the base member 120, and a pair of lever bodies 15 and 16 extending from the shaft 14 at a predetermined angle in a radial direction. The bell crank 4 is mounted on the turn-motion guide 6, in a state where the shaft 14 of the bell crank 4 extends along a longitudinal direction of the base member 120 and is inserted into a shaft-insertion hole 17 of the body 9 in the turn-motion guide 6 of the base member 120. The bell crank 4 can turn around its axis 14a.

[0016] A torsion coil spring 18 is wound around the shaft 14 of the bell crank 4. A tip end of the shaft 14 is provided with a pin-fitting hole 19 along a direction intersecting with the axis 14a. Although the pin-fitting hole 19 is a through hole penetrating the shaft 14 in Fig. 4, the pin-fitting hole 19 need not penetrate the shaft 14. Of the

pair of lever bodies 15 and 16, the lever body 15 abuts against the locking part 5 of the guide arm 3 of the handle 110, and the lever body 16 is connected to a lock device (not shown) of the handle 110.

[0017] According to this, a twisting force (resilient restoring force) of the torsion coil spring 18 is always applied to the guide arm 3 of the handle 110 in a direction contrary to the pull-up direction of the handle 110 (direction shown by arrows P in Figs. 4 and 5), and the handle 110 is held in a state where it is accommodated in the base member 120. In Fig. 4, a state where the handle 110 is accommodated in the base member 120 is shown by solid lines and a state where the handle 110 is pulled up is shown by phantom lines. A direction in which the shaft 14 of the bell crank 4 turns when the handle 110 is pulled up is shown by an arrow 22. As shown in Figs. 1 and 2, a glass stopper 21 projects from one of sidewalls of the turn-motion guide 6 of the base member 120.

[0018] As shown in Figs. 2 and 4, a case body 23 (cover body) is mounted on the body 9 in the turn-motion guide 6 of the base member 120 at a location directly below the shaft 14 of the bell crank 4. A lock pin 24 is accommodated in the case body 23. As shown in Figs. 4 to 6, the case body 23 is formed into a bottomed angular cylindrical shape whose upper surface is opened and lower surface is closed. The case body 23 includes a bottom 23b and a narrow portion 23a having a narrow width in a step form.

[0019] The lock pin 24 includes a pin portion 26 which is fitted into the pin-fitting hole 19 of the shaft 14 of the bell crank 4, and a base end 27 having a predetermined weight. The base end 27 includes a spherical portion 27a formed by cutting a portion of a sphere having a diameter larger than that of the pin portion 26. As shown in Fig. 6B, inner widths W1 and W2 of the narrow portion 23a of the case body 23 are slightly larger than an outer diameter of the spherical portion 27a of the base end 27. Hence, the spherical portion 27a of the base end 27 of the lock pin 24 can come into point contact with an inner wall surface of the narrow portion 23a of the case body 23 at four sliding portions e1 to e4.

[0020] A soft body 31 (cushion material) is interposed between the spherical portion 27a of the base end 27 of the lock pin 24 and the bottom 23b of the case body 23 which is opposed to the spherical portion 27a in a state where the soft body 31 is fixed to the spherical portion 27a of the base end 27. As shown in Fig. 6A, the soft body 31 is formed into two coaxial columnar shapes, and is made of rubber/elastomer material such as ethylene-based rubber (EPDM and the like) and thermoplastic elastomer (TPO and the like).

[0021] More specifically, the soft body 31 includes a large diameter-side body 31a and a small diameter-side fitting portion 31b (cushion-side fitting portion). Corresponding to the fitting portion 31b of the soft body 31, a concave fitting portion 27b (pin-side fitting portion) is formed in the spherical portion 27a of the base end 27 of the lock pin 24. The fitting portion 31b of the soft body

31 is press-fitted into and fixed to the fitting portion 27b of the base end 27, and the soft body 31 and the base end 27 of the lock pin 24 are integrally formed together.

[0022] Referring to Figs. 4 and 5 again, a pin-guide groove 28 is formed in the body 9 of the turn-motion guide 6 for guiding the pin portion 26 of the lock pin 24. A compression spring 29 which biases the lock pin 24 toward the bottom 23b of the case body 23 is resiliently provided between the body 9 and the base end 27 of the slide pin 24. A biasing force of the compression spring 29 is small, and is smaller than inertia applied to the lock pin 24 when a load F not less than a predetermined magnitude is applied to a door D of a vehicle. In other words, when the load F not less than the predetermined magnitude is applied to the door D of the vehicle, the slide pin 24 is relatively slid against the biasing force of the compression spring 29 (this will be described later).

[0023] In a normal state, the base end 27 of the lock pin 24 is accommodated in the narrow portion 23a of the case body 23 and is supported by the bottom 23b through the soft body 31. At this time, a tip end of the pin portion 26 of the lock pin 24 is disposed in the pin-guide groove 28 of the body 9 of the base member 120 and does not project into the shaft-insertion hole 17 of the body 9. In other words, the pin portion 26 of the lock pin 24 is in a state of being disengaged from the pin-fitting hole 19 of the shaft 14 of the bell crank 4. Hence, turning motion of the shaft 14 of the bell crank 4 is not hindered.

[0024] Next, an operation of the reference example configured as described above will be described. As shown in Figs. 4 and 5, the handle 110 is connected to the base member 120 in a normal state and can turn around the turning fulcrum C of the fulcrum arm 2. At this time, the locking part 5 of the guide arm 3 of the handle 110 is locked to the lever body 15 of the bell crank 4 to which a twisting force of the torsion coil spring 18 is applied. The handle 110 which was pulled up by a user is turned toward a front side (toward the user and in the direction of the arrow P) around the turning fulcrum C against the twisting force of the torsion coil spring 18.

[0025] As shown in Figs. 7 and 8, if a load F of predetermined magnitude is applied in a direction contrary to the pull-up direction (direction of the arrow P) of the handle 110 is applied to the door D of the vehicle, the same load F is applied also to the base member 120. The handle 110 tries to turn in the pull-up direction due to a reaction at this time, and this may cause the door D of the vehicle to open. According to the door handle device 100 of this reference example, however, a resting state of the lock pin 24 is maintained by inertia caused due to a weight of the base end 27 of the lock pin 24, and the lock pin 24 is relatively slid in a direction contrary to the application direction of the load F against the biasing force of the compression spring 29. According to this, the pin portion 26 of the lock pin 24 projects into the shaft-insertion hole 17 from the pin-guide groove 28 of the body 9 of the base member 120 and is fitted into the pin-fitting hole 19 of the shaft 14 of the bell crank 4 before the door D is unlocked

(state of a phase corresponding to an initial opening operation of the handle 110). As a result, turning motion of the shaft 14 of the bell crank 4 is prevented, and the handle 110 is prevented from turning in the pull-up direction.

[0026] If the load F applied to the door D of the vehicle disappears, the lock pin 24 is relatively slid in the opposite direction of a biasing force (resilient restoring force) of the compression spring 29, and the pin portion 26 is pulled out from the pin-fitting hole 19 of the shaft 14 of the bell crank 4. Hence, the shaft 14 of the bell crank 4 can turn. As a result, the handle 110 can be pulled up.

[0027] Meanwhile, in the door handle device 100 of the reference example, the soft body 31 is interposed between the base end 27 of the lock pin 24 and the bottom 23b of the case body 23 which is opposed to the base end 27 in a state where the soft body 31 is fixed to the base end 27. When the lock pin 24 is disposed at a normal position, the base end 27 of the lock pin 24 is supported by the bottom 23b of the case body 23 through the soft body 31.

[0028] According to this, even if the lock pin 24 collides against the bottom 23b of the case body 23 when the door D is strongly closed, since the lock pin 24 collides against the case body 23 through the soft body 31, it is possible to excellently prevent hammering sound (chattering sound) from being generated.

[0029] Although the soft body 31 and the base end 27 of the lock pin 24 are integrally formed together by press-fitting and fixing the fitting portion 31b of the soft body 31 into and to the fitting portion 27b of the base 27 in the reference example, the reference example is not limited to this configuration. For example, the soft body 31 may be fixed to the base end 27 of the lock pin 24 through adhesive, or the soft body 31 may be fixed to the base end 27 of the lock pin 24 through insert molding. In this case, if the base end 27 of the lock pin 24 includes the concave fitting portion 27b as in the reference example, it is possible to excellently prevent the soft body 31 and the base end 27 of the lock pin 24 from separating from each other (especially in radial direction).

[0030] In the reference example, since the case body 23 is closed with the bottom 23b thereof, the lock pin 24 is accommodated in the case body 23 almost hermetically, and an effect of preventing sand or rain water from entering the sliding portion of the lock pin 24 can be obtained. However, as shown in Fig. 9, for example, it is possible to employ a configuration that a through hole 23c is formed in the bottom 23b, and when the lock pin 24 is disposed at the normal position, the through hole 23c is closed with the soft body 31, i.e., the soft body 31 functions as a sealing material which closes the through hole 23c. Since other configuration is the same as that of the reference example, the same symbols are allocated to the same members, and description thereof will be omitted.

[0031] According to Example 1, like the reference example in which the through hole 23c is not formed in the

bottom 23b, sand and rain water are prevented from entering the sliding portion of the lock pin 24, it is possible to previously check an operation of the lock pin 24 before shipment of the vehicular door handle device 100, for example, by effectively utilizing the through hole 23c. More specifically, a pin as a checking instrument is inserted into the through hole 23c, and when the lock pin 24 is forcibly pushed through the soft body 31, if the opening operation of the handle 110 is restricted, and it is possible to know that the pin portion 26 of the lock pin 24 is engaged with the pin-fitting hole 19 of the shaft 14 of the bell crank 4. Next, when the pin is pulled out from the through hole 23c, if the opening operation of the handle 110 is again permitted, it is possible to know that the pin portion 26 of the lock pin 24 separates from the pin-fitting hole 19 of the shaft 14 of the bell crank 4 and the engagement therebetween is released.

[0032] In Example 1, the concave fitting portion 27b (pin-side fitting portion) is formed in the base end 27 of the lock pin 24 and the convex fitting portion 31b (cushion-side fitting portion) is formed on the soft body 31, but this configuration may be reversed, i.e., a convex fitting portion (pin-side fitting portion) may be formed on the base end 27 of the lock pin 24 and a concave fitting portion (cushion-side fitting portion) may be formed in the soft body 31.

[0033] In Example 1, the fitting portion 31b of the soft body 31 is insert-molded or press-fitted into the fitting portion 27b of the base end 27 so that the soft body 31 is fixed to the base end 27 of the lock pin 24, but the invention is not limited to this configuration. As shown in Fig. 10, for example, it is possible to employ a configuration that the through hole 23c may be formed in the bottom 23b of the case body 23 and a soft body 131 may be fitted into and fixed to the through hole 23c. Since other configuration is the same as that of Example 1, the same symbols are allocated to the same members, and description thereof will be omitted.

[0034] In Example 2, a soft body 131 is made of rubber/elastomer material like the soft body 31, and includes a substantially circular truncated conical body 131a, a disk-shaped lid 131b and a shaft 131c which connects the body 131a and the lid 131b to each other. The body 131a is disposed inside a case body 23, the lid 131b is disposed outside the case body 23, and the shaft 131c is disposed in a through hole 23c of a bottom 23b of the case body 23. A fitting portion 27b is not formed in a spherical portion 27a of a base end 27 of a lock pin 24, and the body 131a of the soft body 131 comes into contact with a tip end surface of the spherical portion 27a.

[0035] In Example 2, as shown by a two-dot chain line in Fig. 11, before the soft body 131 is fitted into and fixed to the through hole 23c, a pin as a checking instrument is inserted into the through hole 23c, the lock pin 24 is forcibly pressed to confirm that an opening operation of a handle 110 is restricted. Then, the pin is pulled out from the through hole 23c to confirm that the opening operation of the handle 110 is permitted. After that, the soft body

131 is fitted into and fixed to the through hole 23c through the shaft 131c. According to this, the soft body 131 mounted on the case body 23 serves as a mark, and it is possible to immediately visually recognize that the operation check of the lock pin 24 is completed.

[0036] In a state where the soft body 131 is fitted into and fixed to the through hole 23c, when the lock pin 24 is disposed at a normal position, the base end 27 of the lock pin 24 is supported by the bottom 23b of the case body 23 through the body 131a of the soft body 131. The lid 131b of the soft body 131 prevents sand and rain water from entering a sliding portion of the lock pin 24.

[0037] In Example 2, when the lock pin 24 is disposed at the normal position, the base end 27 of the lock pin 24 is supported by the bottom 23b of the case body 23 through the body 131a of the soft body 131. According to this, since the lock pin 24 collides against the soft body 131 mounted on the case body 23 when a door D is strongly closed, it is possible to excellently prevent hammering sound (chattering sound) from being generated. The lid 131b of the soft body 131 prevents sand and rain water from entering the sliding portion of the lock pin 24.

[0038] In Example 2, the opening operation of the handle 110 is restricted utilizing the checking instrument such as a pin before the soft body 131 is fitted into and fixed to the through hole 23c, and the soft body 131 is fitted into and fixed to the through hole 23c after confirming that the opening operation is again permitted. However, the invention is not limited to this configuration, and it is also possible to form, in the soft body 131, a through hole 131d penetrating the soft body 131 in its axial direction and having a small diameter such that entering of sand and rain water can be sufficiently prevented. If the operation check is carried out utilizing the through hole 131d as in Example 3, the soft body 131 can be mounted on the case body 23 before the operation check.

[0039] In Examples 1 to 3, the body 9 of the base member 120 is formed into the arched shape, the turning fulcrum 11 for connecting the fulcrum arm 2 of the handle 110 is integrally formed on the front portion of the body 9, and the turn-motion guide 6 for connecting the guide arm 3 of the handle 110 is integrally formed on the rear portion of the body 9. However, the invention is not limited to this configuration, and it is possible to employ a so-called frameless type in which the turning fulcrum and the turn-motion guide are formed as separate members.

[Description of Reference Numerals]

[0040]

D: door

P: arrow (pull-up direction)

100: door handle device

110: handle

120: base member

2: fulcrum arm

5 3: guide arm

4: bell crank (restriction member)

6: turn-motion guide (operation guide)

10 14: shaft (restriction member)

14a: axis

15 18: torsion coil spring (restriction member)

19: pin-fitting hole (lock pin hole)

20 23: case body (cover body)

23b: bottom

23c: through hole

25 24: lock pin

26: pin portion

27: base end

30 27a: spherical portion

27b: fitting portion (pin-side fitting portion)

35 28: pin-guide groove (pin guide)

29: compression spring (spring member)

31, 131: soft body (cushion material)

40 31b: fitting portion (cushion-side fitting portion)

Claims

1. A vehicular door handle device(100) mounted on a door(D) of a vehicle for carrying out an opening operation to unlock the door, comprising:

50 a base member (120) fixed to the door (D) of the vehicle; and
a handle(110) in which a fulcrum arm(2) connected to a turning fulcrum(C) of the base member(120) is formed on one end of the handle (110), and a guide arm(3) connected to an operation guide (6) formed on the base member (120) is formed on a free end which is the other end of the handle(110); wherein:
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the operation guide(6) is provided with a restriction member(4) which includes a shaft(14) connected to the guide arm(3) of the handle(110) and configured to turn around an axis(14a) intersecting with a pull-up direction(P) of the handle(110) when the handle(110) is pulled up, and a pair of lever bodies (15, 16), one (15) of which abuts against a locking part of the guide arm(3) when the handle(110) is pulled up and the other (16) of which stops turning motion of the one lever body(15) in tandem with a lock device;

a lock pin hole (19) is formed in the shaft (14) and opens toward the door(D) in a direction intersecting with the axis (14a) and in a phase corresponding to an initial opening operation of the handle(110) in which the door(D) is not unlocked;

a case body (23) is disposed in the base member (120) so as to face the lock pin hole (19), and a lock pin (24) is disposed in the case body(23); the lock pin(24) includes a pin portion(26) which is guided by a pin-guide groove(28) formed in the base member(110) and which is fitted into the lock pin hole (19), and a base end(27) has a predetermined weight;

a spring member (29) biased to a position where the lock pin (24) is disengaged from the lock pin hole (19) is disposed between the pin-guide groove(28) and the base end(27); when an impact load (F) exceeding a biasing force of the spring member (29) is generated with respect to the door(D), the pin portion (26) is relatively fitted into the lock pin hole(19) by inertia of the lock pin(24), and turning motion of the shaft (14) around its axis (14a) is restricted to prevent the door(D) from being unlocked;

a through hole(23c) for operation check of the lock pin (24) is formed in a bottom(23b) of the case body (23), and a soft body(31,131) having a size capable of closing the through hole(23c) of the bottom(23b) is interposed between the bottom (23b) and the through hole (23c) or the base end (27); and

the soft body (31, 131) seals the through hole (23c), and when the lock pin (24) is moved toward the bottom (23b) by the spring member (29), the soft body(31,131) stops vibration of the lock pin(24) and hammering sound generated by the vibration.

2. The vehicular door handle device(100) according to claim 1, wherein a concave or convex pin-side fitting portion (27b) is formed on the base end (27) of the lock pin (24), a convex or concave soft body-side fitting portion (31b) which can be press-fitted into the pin-side fitting portion(27b) is formed in the soft body (31), and the soft body(31) is press-fitted into and fixed to the base end(27) of the lock pin(24).

3. The vehicular door handle device(100) according to claim 1, wherein the soft body(31) is formed on the base end(27) of the lock pin(24) through insert molding.

4. The vehicular door handle device(100) according to claim 2 or 3, wherein when the lock pin(24) is disposed at the position, the through hole(23c) is closed with the soft body (131).

5. The vehicular door handle device(131) according to claim 1, wherein the soft body (131) is fitted into and fixed to the through hole (23c).

FIG. 1

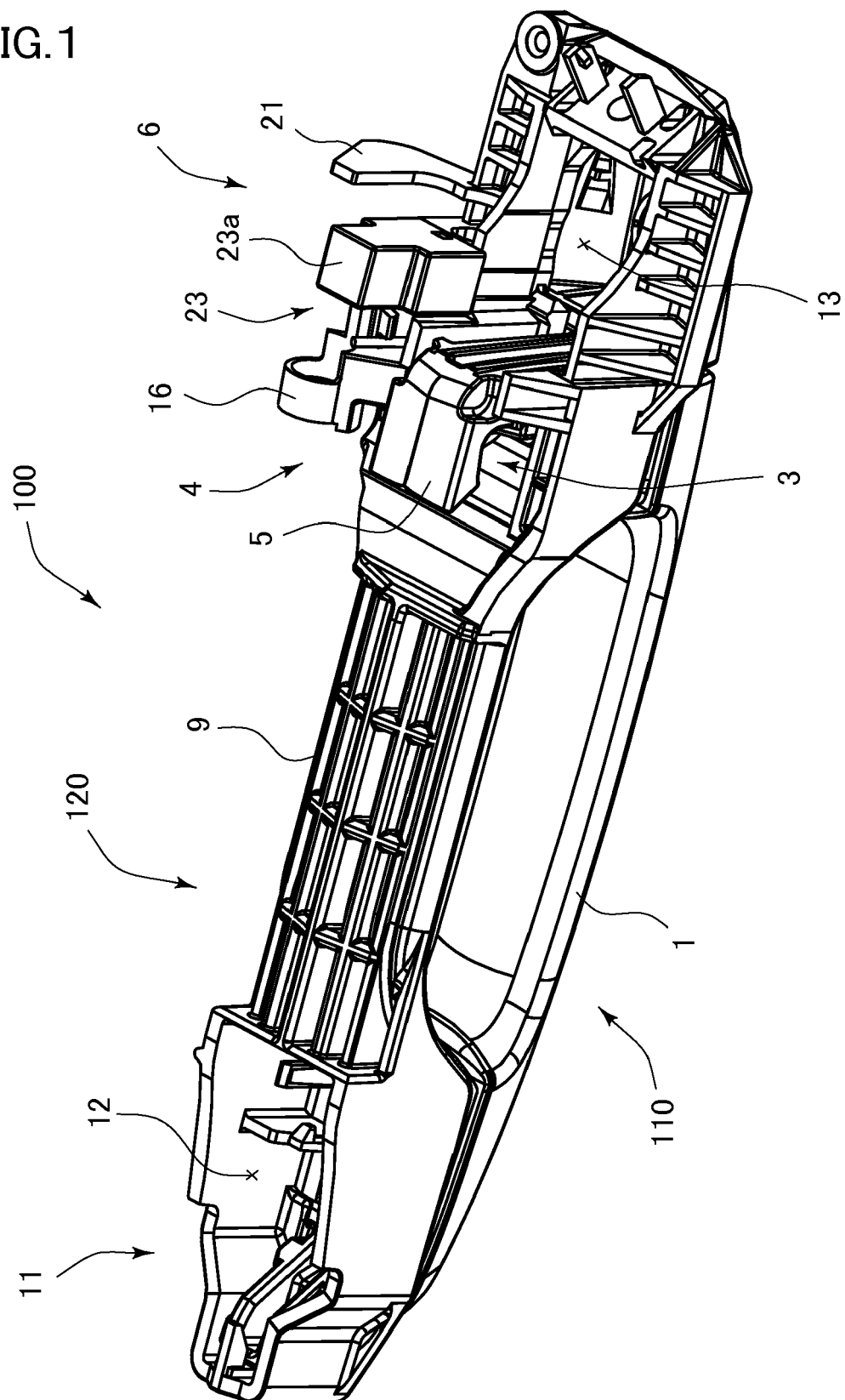


FIG.2

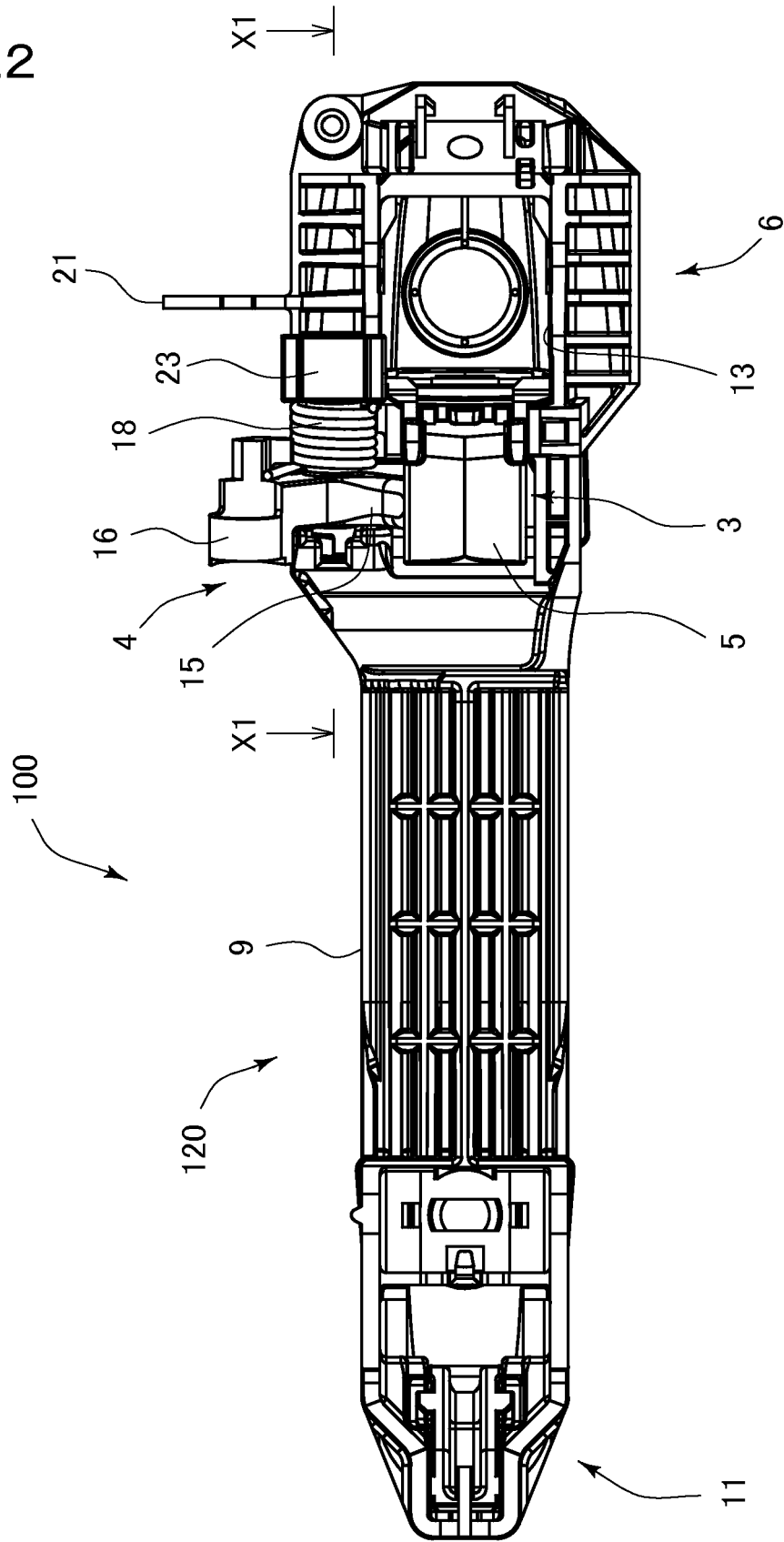


FIG.3

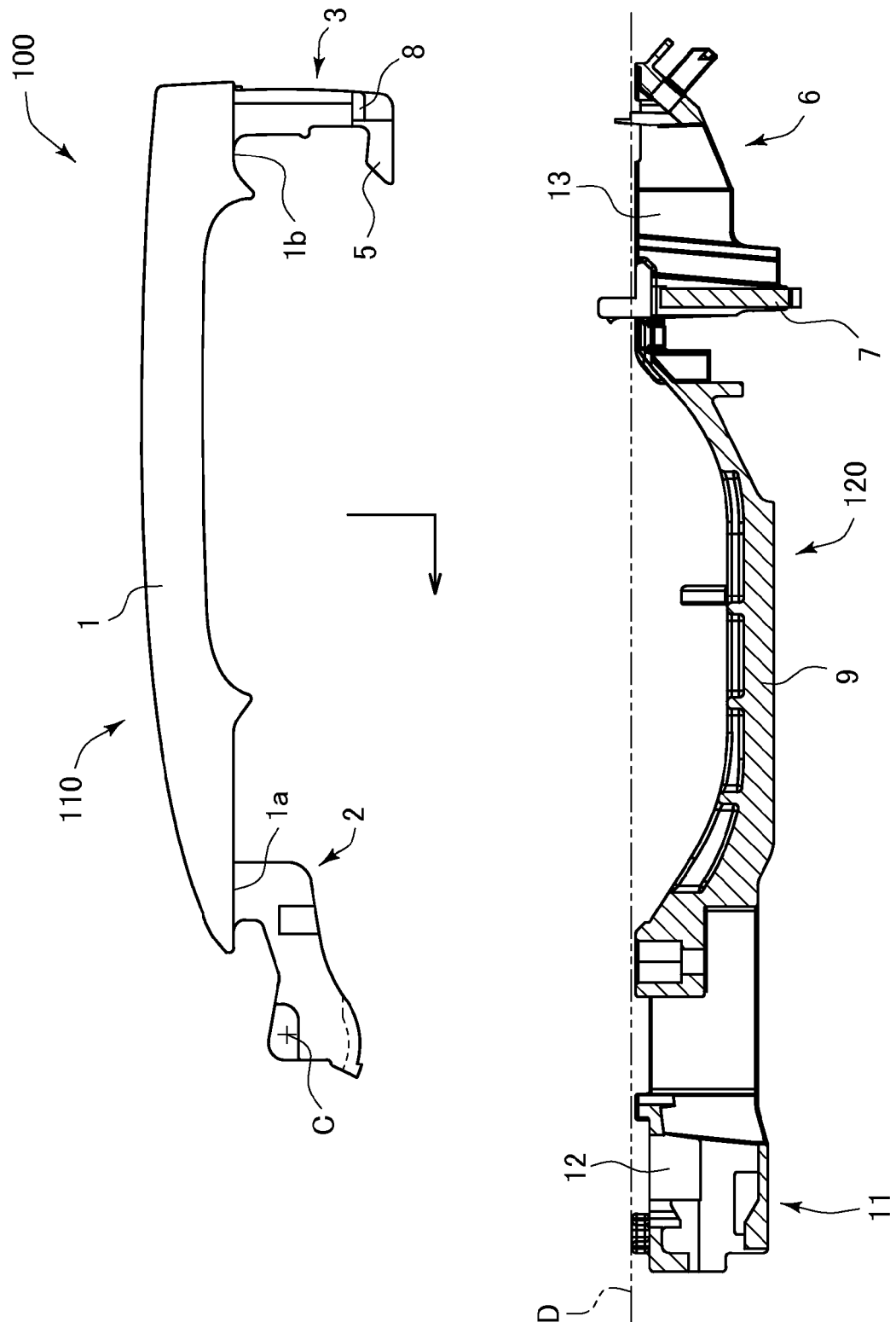


FIG.4

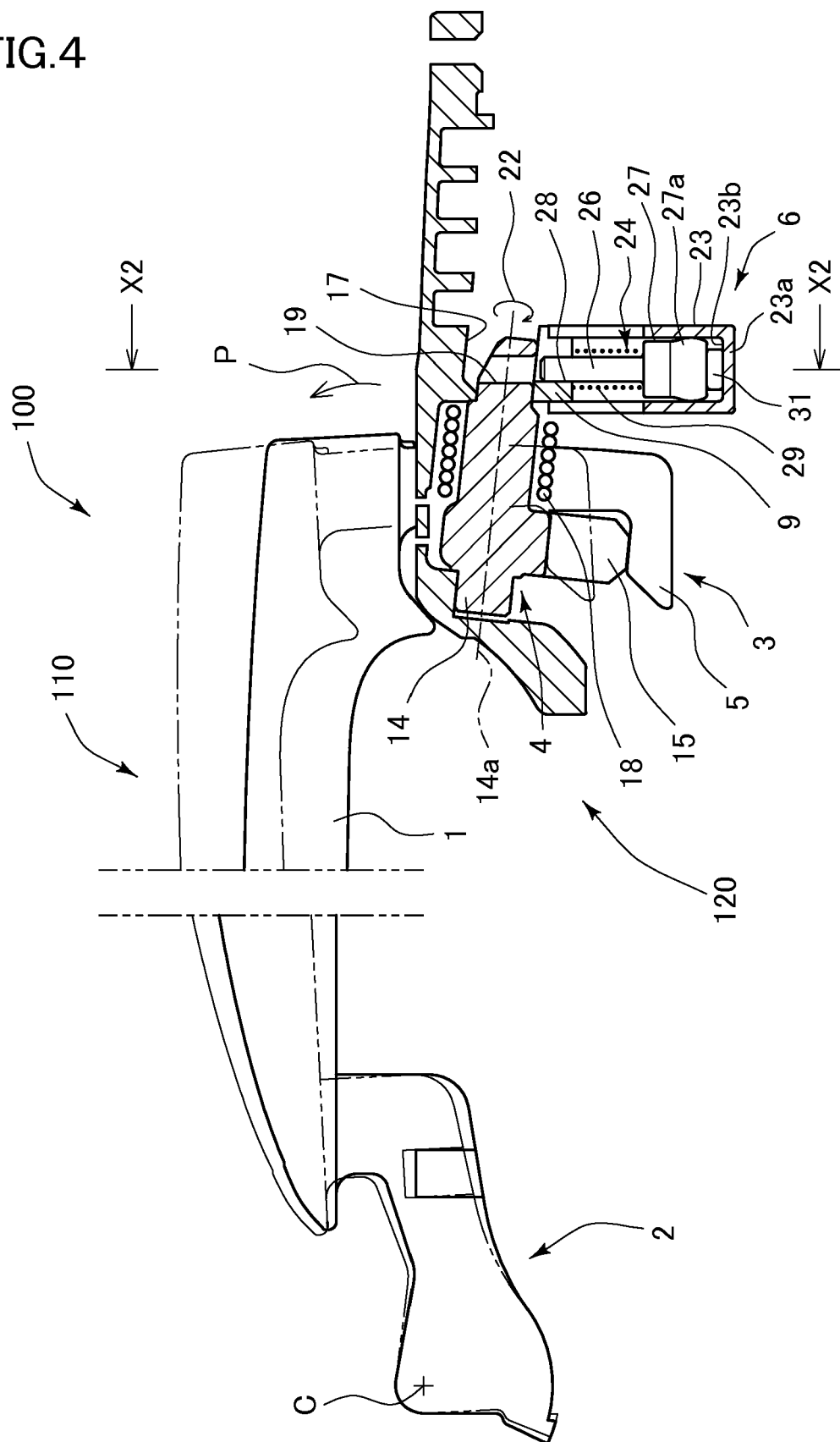


FIG.5

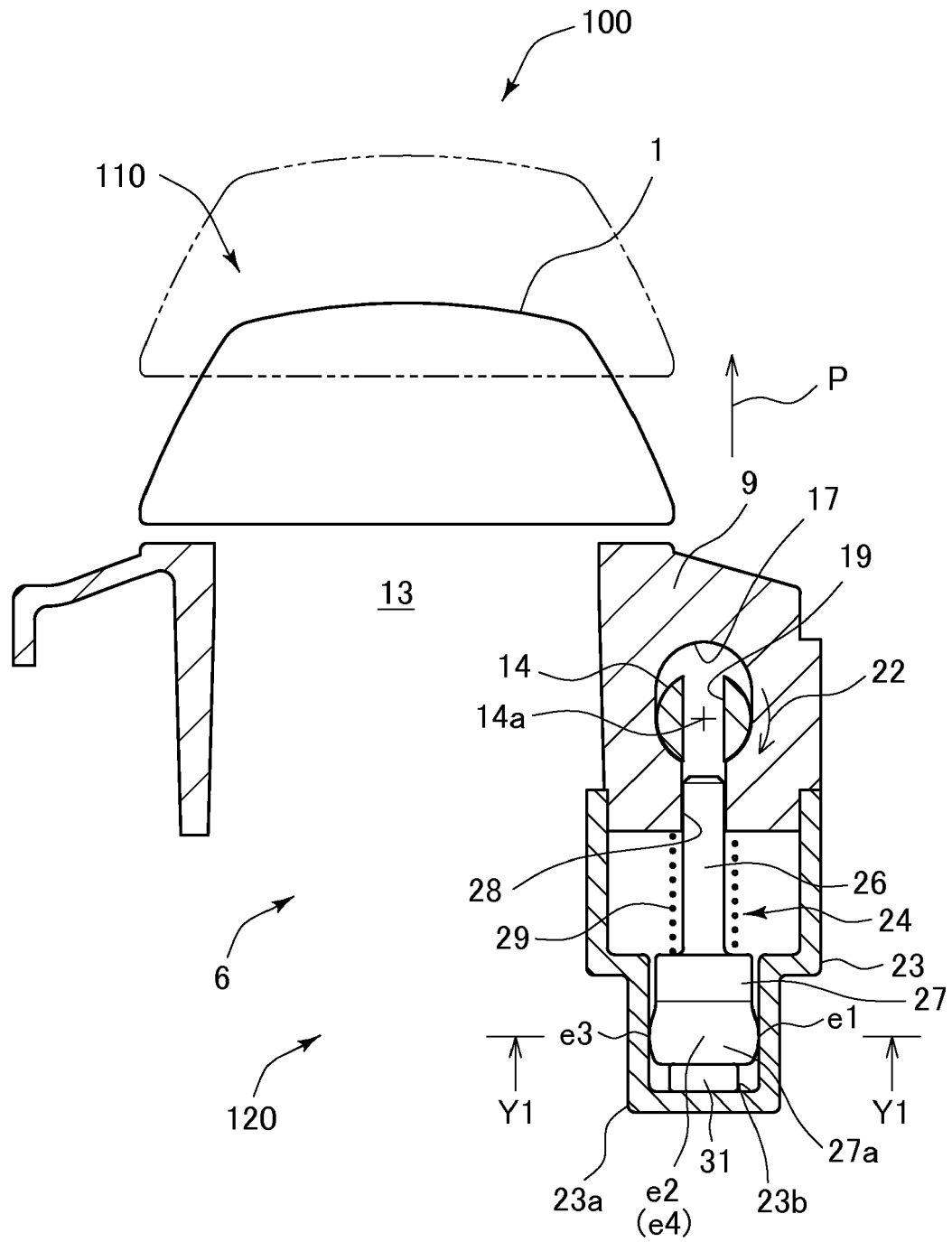


FIG.6A

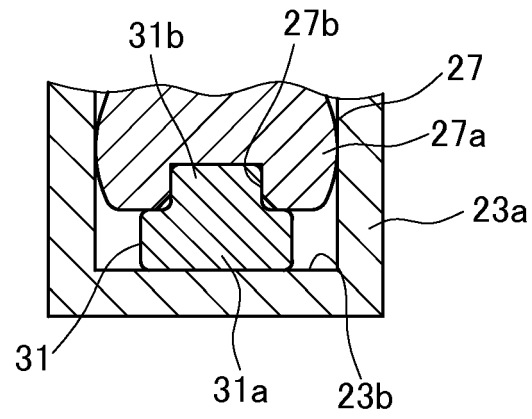


FIG.6B

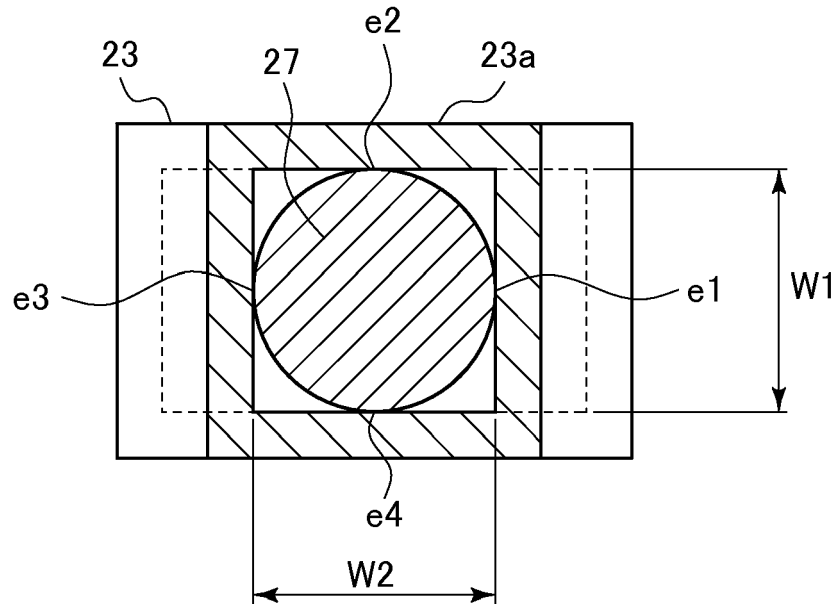


FIG. 7

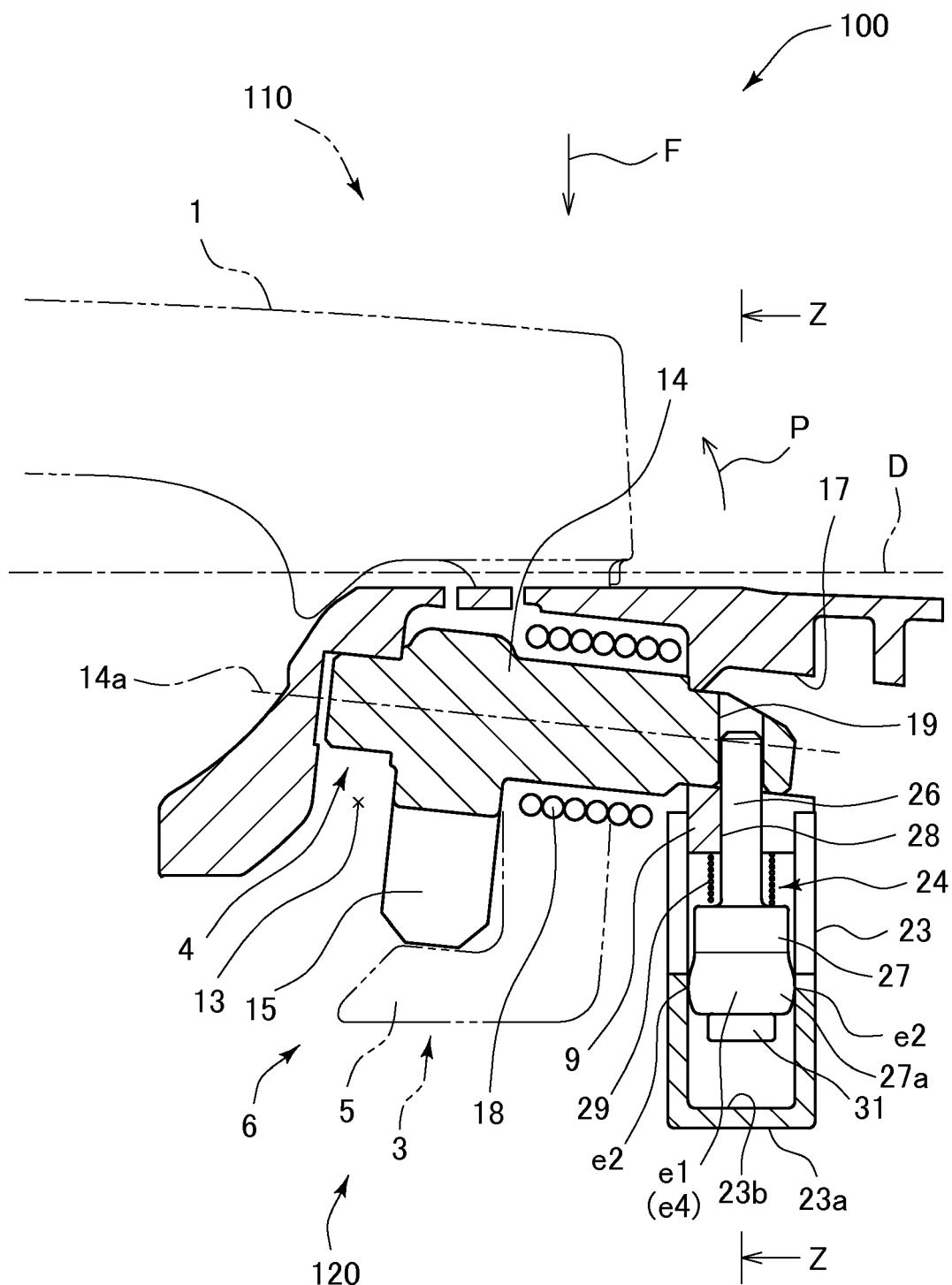


FIG.8

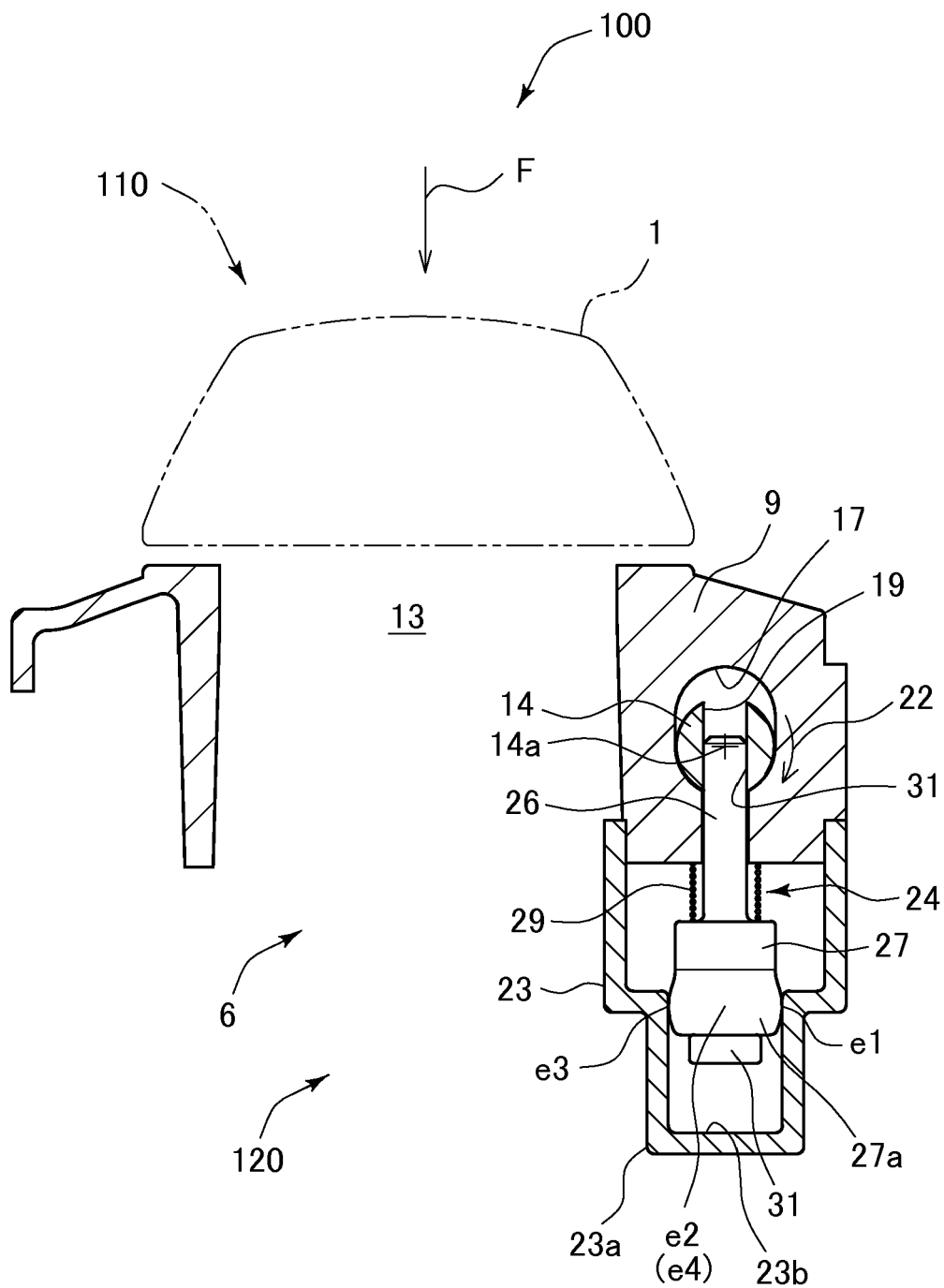


FIG.9

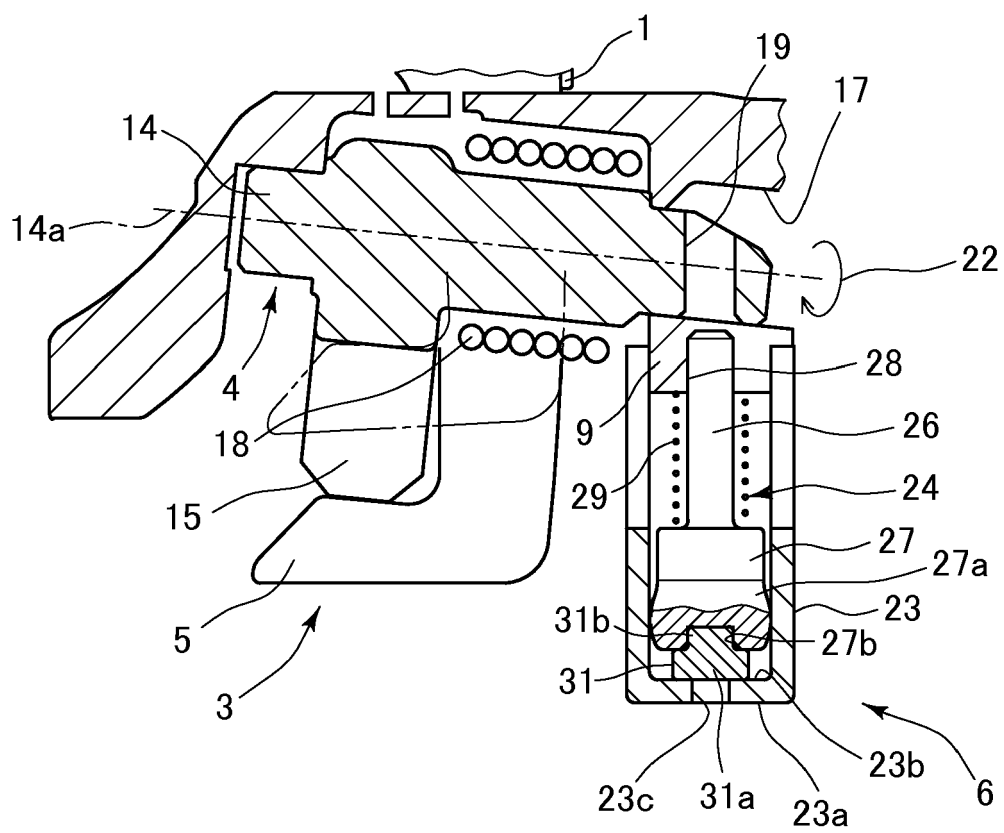


FIG. 10

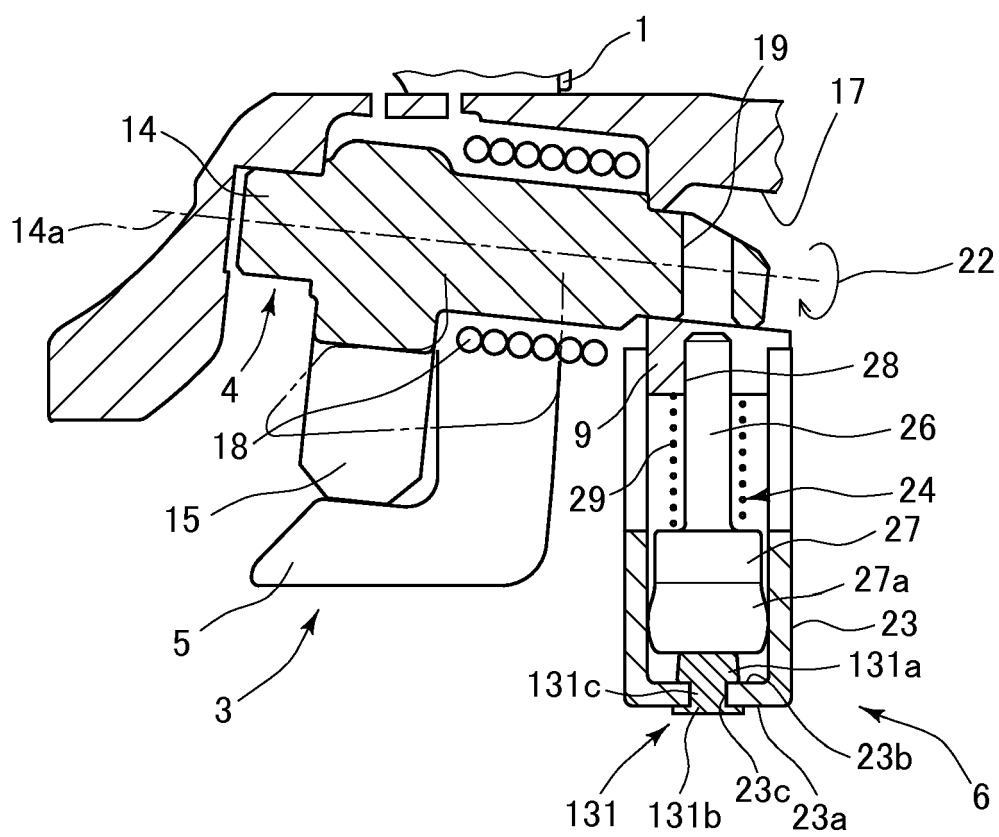


FIG. 1 1

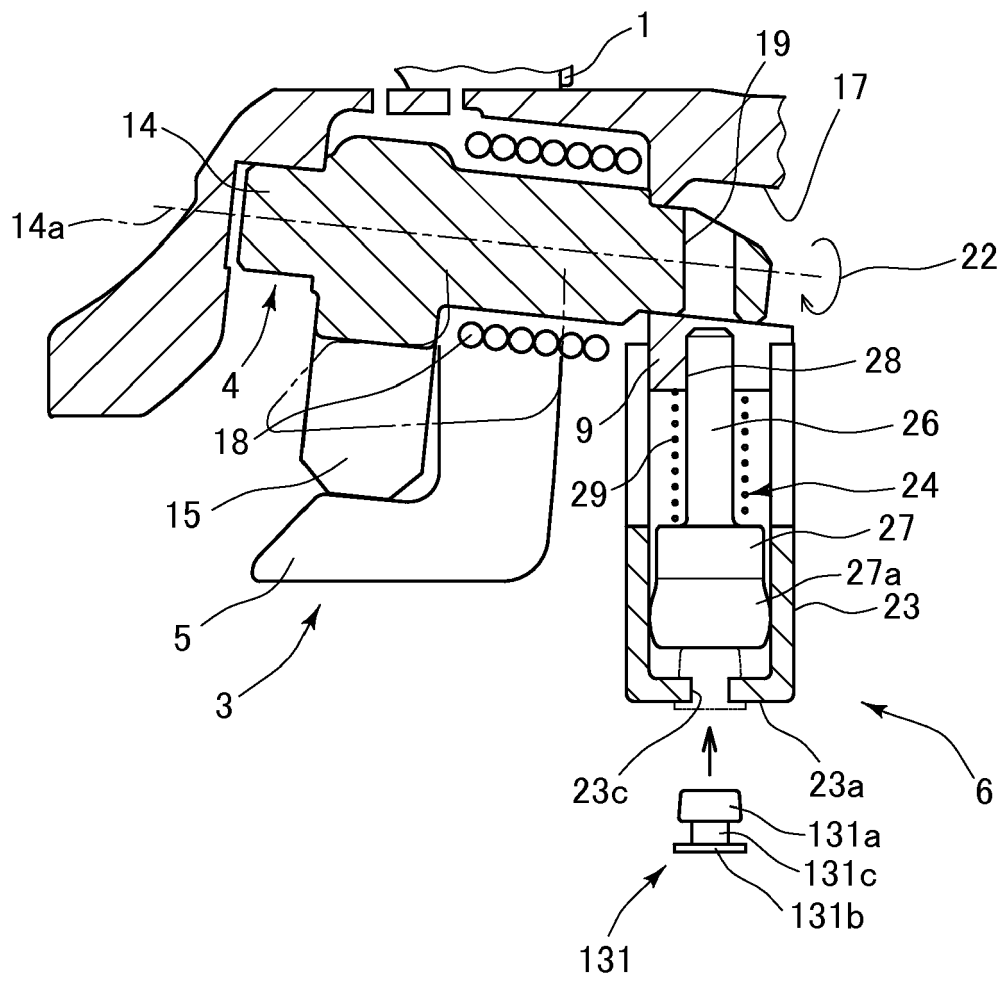
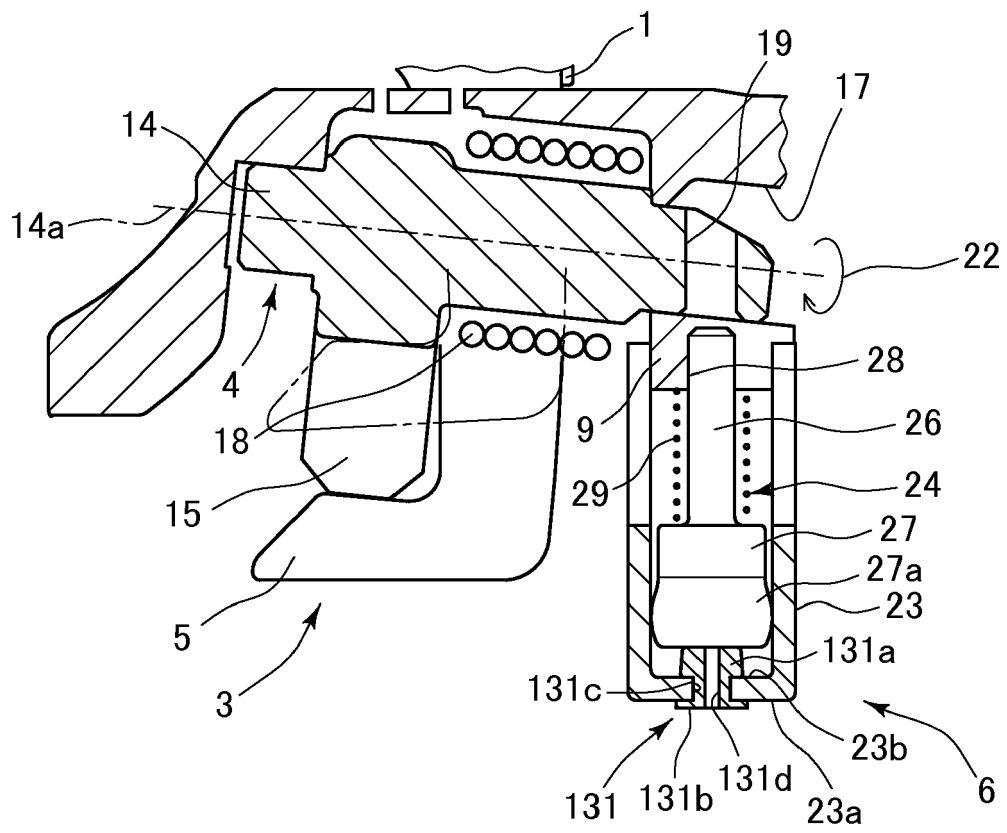


FIG.12



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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