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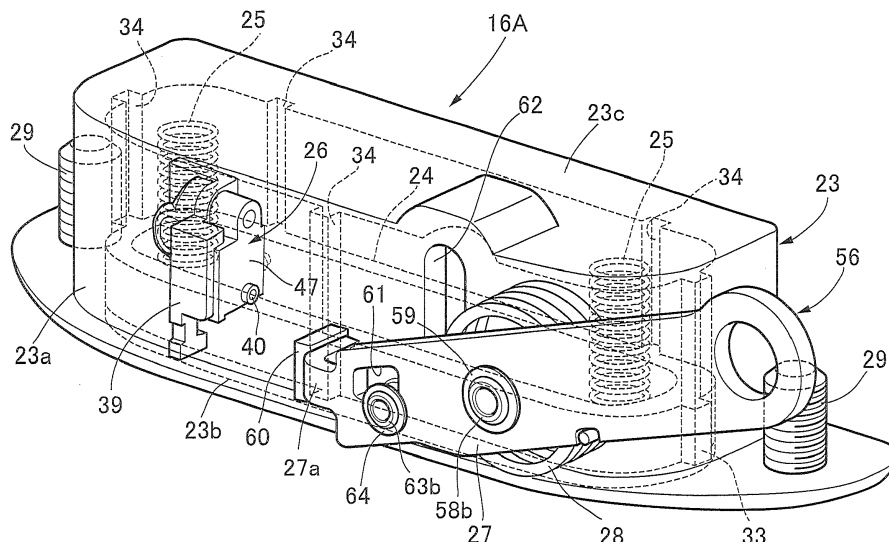
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BA ME(30) Priority: **11.04.2011 JP 2011087209**(71) Applicant: **Kabushiki Kaisha Honda Lock****Sadowara-cho****Miyazaki-shi, Miyazaki (JP)**(72) Inventor: **Fujiwara, Hiroto****Miyazaki-shi, Miyazaki (JP)**(74) Representative: **Prechtel, Jörg****Weickmann & Weickmann****Patentanwälte****Postfach 86 08 20****81635 München (DE)**(54) **Latch release device for vehicle door**

(57) A latch release device for a vehicle door includes: an operation member (24); a first spring (25) that urges the operation member (24) to a non-operation position side; a switch (26) that is connected to an electric actuator (50) so as to be made electrically continuous in response to an operation of the operation member (24) from the non-operation position to a first operation position; and latch release operation force transmitting means (56) that mechanically transmits a latch release operation force to a latch device (19) in response to an

operation of the operation member (24) to a second operation position. In the latch release device, a rotary lever (27) that constitutes part of the latch release operation force transmitting means (56) to rotate by being linked with an operation of the operation member (24) from the first operation position to the second operation position is urged by a second spring (28) to a non-rotation position side. Accordingly, it is possible to avoid an unnecessary emergency operation by generating an obvious difference in operation loads at a time of a normal operation and at a time of an emergency operation.

FIG.4

Description

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0001] The present invention relates to a latch release device for a vehicle door, comprising: a latch device that has an electric actuator which operates to release a latch state of a vehicle door and that also enables release of the latch state in response to a mechanical input of a latch release operation force; an operation member; a first spring that urges the operation member to a non-operation position side; a switch that is connected to the electric actuator so as to be made electrically continuous in response to an operation of the operation member from the non-operation position to a first operation position; and latch release operation force transmitting means that mechanically transmits a latch release operation force to the latch device in response to an operation of the operation member to a second operation position, an operation amount from the non-operation position to the second operation position being larger than an operation amount from the non-operation position to the first operation position.

DESCRIPTION OF THE RELATED ART

[0002] A device that can release a latch state of a vehicle door electrically and mechanically by manipulation of an open button is known by Japanese Utility Model Publication No. 6-35091, and in this device, an electric switch is constructed by a contactor which is provided at a tip end portion of the open button which is urged to a non-operation position side with a first spring, and a switch contact which is supported by a second spring to be in contact with the contactor when the open button is pressed in by a predetermined small stroke. The electric switch is made electrically continuous by pressing in the open button which is disposed in a vehicle compartment by a small stroke at a normal time, whereby a latch state of a vehicle door is electrically released, and at an emergency when electrical release of latch is disabled due to battery being dead or the like, a latch release operation force is inputted into the latch device via an arm and a cable which are connected to the open button by pressing in the open button more than that at the normal operation time.

SUMMARY OF THE INVENTION

[0003] Incidentally, in the device disclosed in Japanese Utility Model Publication No. 6-35091, the second spring which supports the switch contact exhibits a spring force which holds the switch contact at the position where the switch contact is in contact with the contactor when the open button is pressed in by a predetermined small stroke, and the spring force of the second spring is set

to be extremely small. Accordingly, when at an emergency, the open button is pressed in more than that at the time of a normal operation, only the spring force of the first spring substantially acts on the open button, and the open button and the arm are always connected to be linked with each other. Therefore, a difference does not occur to the operation loads at the time of a normal operation and at a time of an emergency operation. Accordingly, even at the time of a normal operation, an emergency operation of pressing in the open button more deeply is sometimes performed, which is not preferable in operation.

[0004] The present invention is made in view of such circumstances, and has an object thereof to enhance operability by enabling an unnecessary emergency operation to be avoided by generating an obvious difference in operation loads at a time of a normal operation and at a time of an emergency operation.

[0005] In order to achieve the object, according to a feature of the present invention, there is provided a latch release device for a vehicle door, comprising: a latch device that has an electric actuator which operates to release a latch state of a vehicle door and that also enables release of the latch state in response to a mechanical input of a latch release operation force; an operation member; a first spring that urges the operation member to a non-operation position side; a switch that is connected to the electric actuator so as to be made electrically continuous in response to an operation of the operation member from the non-operation position to a first operation position; and latch release operation force transmitting means that mechanically transmits a latch release operation force to the latch device in response to an operation of the operation member to a second operation position, an operation amount from the non-operation position to the second operation position being larger than an operation amount from the non-operation position to the first operation position, **characterized in that** the latch release device further comprises: a rotary lever that constitutes a part of the latch release operation force transmitting means to rotate by being linked with an operation of the operation member from the first operation position to the second operation position; and a second spring that urges the rotary lever to a non-rotation position side.

[0006] According to the above described constitution of the present invention, in response to the operation member being further operated from the first operation position to the second operation position side, the rotary lever starts to rotate by being linked with the operation member. Therefore, at a normal operation time when the operation member is operated to the first operation position, only the spring force of the first spring acts on the operation member, and thus operation of the operation member can be performed lightly. Meanwhile, at an emergency operation time when the operation member is further operated from the first operation position to the second operation position side, the operation member

and the rotary lever are linked with each other, the spring force of the second spring acts on the operation member in addition to the spring force of the first spring, the operation becomes heavy as compared with that at the normal operation time. Accordingly, an obvious difference occurs to the operation loads at the normal operation time and at the emergency operation time, and an unnecessary emergency operation can be prevented from being performed at the normal operation time, whereby enhancement in operability can be promoted.

[0007] Here, an electric motor 50 of embodiments corresponds to the electric actuator of the present invention; and a front side door D of the embodiments corresponds to the vehicle door of the present invention.

[0008] The above and other objects, characteristics and advantages of the present invention will be clear from detailed descriptions of the preferred embodiments which will be provided below while referring to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a perspective view of a passenger vehicle according to a first embodiment; FIG. 2 is an enlarged sectional view taken along a line 2-2 in FIG. 1; FIG. 3 is an enlarged view seen from a direction of an arrow 3 in FIG. 2 in a non-operation state of an operation member; FIG. 4 is a perspective view of latch release operation means; FIG. 5 is a sectional view taken along a line 5-5 in FIG. 3; FIG. 6 is a sectional view taken along a line 6-6 in FIG. 3; FIG. 7 is a sectional view taken along a line 7-7 in FIG. 3; FIG. 8 is a view corresponding to FIG. 3 in a state in which the operation member is operated to a first operation position; FIG. 9 is a view showing a configuration of a control system of an electric motor; FIG. 10 is a view corresponding to FIG. 3 in a state in which the operation member is operated to a second operation position; FIG. 11 is a sectional view taken along a line 11-11 in FIG. 3; FIG. 12 is a side view showing a part of a vehicle door according to a second embodiment; FIG. 13 is a perspective view of latch release operation means seen from an inner side of the vehicle door; and FIG. 14 is an enlarged sectional view taken along a line 14-14 in FIG. 12.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0010] Descriptions will be hereinbelow provided for embodiments of the present invention referring to the attached drawings.

[0011] A first embodiment of the present invention will be described with reference to FIGS. 1 to 11. In FIG. 1, first, on an outer panel 15 of a vehicle door, for example, a front side door D, which is included in this passenger vehicle, latch release operation means 16A, a cylinder lock 17 and a lock switch 18 are placed. A latch device 19 which can switch a latch state for keeping a closed state of the front side door D, and an unlatch state capable

of performing an opening operation of the front side door D, and a door mirror 20 are placed at the front side door D.

[0012] With reference to FIG. 2 in combination, a recessed portion 21 which is recessed to an inner side is provided in the outer panel 15 of the front side door D, and the latch release operation means 16A is attached to a mounting plate portion 22, which is integrally provided on the outer panel 15 to construct an upper wall of the recessed portion 21, so as to be capable of being operated with a hand which is put into the recessed portion 21 from an outside.

[0013] With Reference to FIGS. 3 to 6 in combination, the latch release operation means 16A includes a case 23 which is mounted to the mounting plate portion 22 of the outer panel 15, an operation member 24 which is slidably fitted in the case 23 to be able to move in an up-down direction, a pair of first springs 25 and 25 which are provided between the operation member 24 and the case 23, a switch 26 which is mounted to the case 23 to be made electrically continuous in response to movement of the operation member 24 from a non-operation position, a rotary lever 27 which is rotatably supported by the case 23, and a second spring 28 which is provided between the rotary lever 27 and the case 23.

[0014] The case 23 is formed to integrally have a bottomed tubular tube portion 23a having an oblong cross-sectional shape with one end closed with an end wall portion 23c, and a flange portion 23b which is projected to an outer side from the other end of the tube portion 23a, and a pair of bolts 29 and 29 which are disposed in front and at a rear of the tube portion 23a in a front-rear direction of the passenger vehicle are planted in the flange portion 23b. Meanwhile, the mounting plate portion 22 is provided with an opening portion 31 which allows the tube portion 23a to be inserted therein from below, and a pair of bolt insertion holes 32 and 32 which are disposed in front and at a rear of the tube portion 23a in the front-rear direction of the passenger vehicle. While the tube portion 23a is inserted in the opening portion 31 from below, the bolts 29 are inserted through the bolt insertion holes 32 respectively to cause the flange portion 23b to abut on an undersurface of the mounting plate portion 22, and nuts 30 and 30 which are screwed onto the bolts 29 in this state are fastened until the nuts 30 and 30 abut against a top surface of the mounting plate portion 22, whereby the case 23 is mounted to the mounting plate portion 22 of the outer panel 15.

[0015] The operation member 24 is formed into a bottomed tubular shape having an outer surface shape corresponding to an inner surface shape of the tube portion 23a of the case 23 with an oblong cross-sectional shape with one end opened and the other end closed with an end wall portion 24a, and is slidably fitted in the tube portion 23a of the case 23 with the end wall portion 24a thereof in a lower position. In addition, a plurality of guide protruding portions 33 which are provided each in a plurality of spots in a peripheral direction of the operation member 24 and extend in the up-down direction are fitted

in a plurality of guide grooves 34 which are provided on an inner surface of the tube portion 23a of the case 23 and extend in the up-down direction, and the operation member 24 is movable in the up-down direction in such a manner that each of the guide protruding portions 33 is guided by each of the guide grooves 34. Further, an antenna 35 is accommodated and fixed in the operation member 24.

[0016] A pair of the first springs 25 are coil springs which are provided in a compressed state between a front portion and a rear portion of the end wall portion 23c of the case 23 in the front-rear direction of the passenger vehicle, and a front portion and a rear portion of the end wall portion 24a of the operation member 24. Spring holding protruding portions 36 and 36 which are inserted into one end portions of the first springs 25 are projectingly provided integrally at the end wall portion 23c of the case 23 to have cruciate cross-sectional shapes. Spring holding tube portions 37 and 37 which allow the other end portions of the first springs 25 to be inserted therein are projectingly provided integrally at the end wall portion 24a of the operation member 24 in such a manner as to have circular cross-sectional shapes. Thus, the operation member 24 is urged downward to a non-operation position side shown in FIG. 3 by the spring force exhibited by the pair of the first springs 25.

[0017] With reference to FIG. 7 in combination, a stay 39 is fixed to an outer surface near to the front portion of the tube portion 23a of the case 23 which is along the front-rear direction of the passenger vehicle, and the switch 26 is fastened to the stay 39 with a screw member 40. In order to fix the stay 39, a positioning pin 41 and a mounting boss 42 are projectingly provided on the outer surface of the tube portion 23a of the case 23, and a positioning hole 43 which allows the positioning pin 41 to be fitted therein, and a mounting hole 44 which allows the mounting boss 42 to be fitted therein are provided at the stay 39. Thus, in a state in which the positioning pin 41 and the mounting boss 42 are fitted in the positioning hole 43 and the mounting hole 44 to allow the stay 39 to abut against the outer surface of the case 23, an enlarged diameter head portion 45a of a screw member 45 which is screwed into the mounting boss 42 is engaged with the stay 39 via a washer 46, and thereby, the stay 39 is fixed to the tube portion 23a of the case 23.

[0018] The switch 26 has a switch case 47 which is fastened to the stay 39 with the screw member 40, and a sensor 48 which is protruded from the switch case 47, and in a state in which the switch case 47 is fastened to the stay 39, a tip end of the sensor 48 is protruded into the case 23. Meanwhile, the operation member 24 is provided with a sensed surface 49 which abuts against the tip end of the sensor 48 to press the sensor 48 to the switch case 47 side, at a position corresponding to a portion at which the switch 26 is placed, and the sensed surface 49 is formed to be inclined so as to be in an upper position as the sensed surface 49 is away from the inner surface of the tube portion 23a of the case 23.

[0019] Thus, the switch 26 is made electrically continuous by the sensor 48 being pressed by the sensed surface 49 when the operation member 24 moves to a first operation position shown in FIG. 8 from the non-operation position shown in FIG. 3.

[0020] With reference to FIG. 9 in combination, the latch device 19 has an electric motor 50 which is an electric actuator which operates to release a latch state of the front side door D, and the switch 26 is connected to the electric motor 50.

[0021] The operation of the electric motor 50 is controlled by a control unit 51 which is placed in the front side door D, and the control unit 51 includes a CPU 52, and a second switch 54 which is interposed between the switch 26 and a power supply 53. Further, the CPU 52 receives signals from the antenna 35 and a receiver unit 55 which are used for transmitting and receiving an ID signal to and from a legitimate portable equipment which is carried by a vehicle user, and the CPU 52 electrically continues the second switch 54 which is included in the control unit 51 when the CPU 52 confirms that the ID signal is a legitimate one. More specifically, when the vehicle user carries the legitimate portable equipment, and operates the operation member 24 to the first operation position, power is supplied to the electric motor 50, and the electric motor 50 is operated, whereby the front side door D is enable to be opened.

[0022] Incidentally, the operation member 24 can be operated to a second operation position shown in FIG. 10 from the non-operation position shown in FIG. 3 via the first operation position shown in FIG. 8, and the rotary lever 27 constitutes a part of latch release operation force transmitting means 56 which mechanically transmits a latch release operation force to the latch device 19 in response to the operation member 24 being operated from the non-operation position to the second operation position.

[0023] A support boss 57 is projectingly provided at the outer surface near to the rear portion of the tube portion 23a of the case 23 along the front-rear direction of the passenger vehicle as shown in FIG. 6, and the rotary lever 27 is rotatably supported at a protruded portion from the support boss 57, of a support shaft 58 which has one end side press-fitted in and fixed to the support boss 57. Thus, the rotary lever 27 is rotatably supported by the support shaft 58 in such a manner as to be held between an annular step portion 58a provided at the support shaft 58 and a washer 59 which is fixed to the support shaft 58 by being engaged with a crimped portion 58b which is formed by crimping the other end of the support shaft 58. In addition, the second spring 28 is a torsion spring which is provided between the case 23 and the rotary lever 27 to surround the support boss 57. The rotary lever 27 is rotated and urged to counterclockwise directions of FIGS. 3, 8 and 10 by the spring force of the second spring 28, and in order to set a rotation end, that is, a non-rotation position in the counterclockwise direction, a regulating portion 60 which receives a protruding portion 27a which

is projectingly provided at one end of the rotary lever 27 is projectingly provided at the outer surface of the tube portion 23a of the case 23.

[0024] With reference to FIG. 11 in combination, a connecting hole 61 is provided at one end portion of the rotary lever 27. Further, a guide hole 62 which extends in the up-down direction at a position corresponding to the one end portion of the rotary lever 27 is provided in the tube portion 23a of the case 23, and a connecting pin 63 having one end portion fixed to the operation member 24 is inserted through the guide hole 62. Further, a small diameter shaft portion 63a which is inserted through the connecting hole 61 at the one end portion of the rotary lever 27 is coaxially and integrally provided at the other end of the connecting pin 63, and a crimped portion 63b which is formed by crimping a tip end of the small diameter shaft portion 63a abuts against and is engaged with a washer 64 which slides in contact with the one end portion of the rotary lever 27.

[0025] Incidentally, the connecting hole 61 is formed to be substantially L-shaped, and when the operation member 24 is in the non-operation position and the rotary lever 27 is in the non-rotation position, the small diameter shaft portion 63a of the connecting pin 63 abuts against a lower edge portion of the connecting hole 61, and in this state, the rotary lever 27 is held, by the spring force of the second spring 28, in the non-rotation position where the protruding portion 27a at one end thereof is allowed to abut on the regulating portion 60 of the case 23 from above, whereby the lower limit position of the operation member 24 which is urged toward a lower side by the pair of the first springs 25 is restricted to the non-operation position.

[0026] Even if the operation member 24 moves between the non-operation position and the first operation position when the rotary lever 27 is in the non-rotation position where the protruding portion 27a abuts against the regulating portion 60, the small diameter shaft portion 63a of the connecting pin 63 only moves in the up-down direction in the connecting hole 61 as shown in FIG. 8, and the rotary lever 27 continues to be kept in the non-rotation position where the protruding portion 27a abuts against the regulating portion 60 by the spring force of the second spring 28, whereas when the operation member 24 further moves to the second operation position side from the first operation position, the small diameter shaft portion 63a of the connecting pin 63 slides in contact with the upper edge portion of the connecting hole 61, and thereby, the rotary lever 27 is rotationally driven in the clockwise direction from the non-rotation position against the spring force of the second spring 28 as shown in FIG. 10.

[0027] More specifically, at the normal operation time when the operation member 24 is operated from the non-operation position to the first operation position, only the spring force of the first springs 25 acts on the operation member 24, whereas when the operation member 24 is further operated from the first operation position to the

second operation position side, the spring force of the second spring 28 acts on the operation member 24 in addition to the spring force of the first springs 25, and the spring load of the second spring 28 is set to be equal to or more than the spring load of the first springs 25 so that an obvious difference occurs to the spring loads which act on the operation member 24 at a normal operation time and at an emergency operation time. Here, when the spring load which acts on the operation member 24 at the normal operation time when the operation member 24 is operated from the non-operation position to the first operation position is set as, for example, 6N, the spring load which acts on the operation member 24 at the emergency operation time when the operation member 24 is operated from the first operation position to the second operation position is, for example, 20N.

[0028] With attention paid to FIG. 2, the latch release operation force transmitting means 56 includes the rotary lever 27 and a rod 66 which connects, for example, the other end portion of the rotary lever 27 and the latch device 19, and the latch release operation force corresponding to the operation of the operation member 24 from the first operation position to the second operation position is mechanically transmitted to the latch device 19 via the rotary lever 27 and the rod 66.

[0029] Incidentally, the rotational force which responds to the rotational operation which is performed by inserting the legitimate mechanical key into the cylinder lock 17 which is provided at the front side door D frontward of the latch release operation means 16A is transmitted to the latch device 19 as shown in FIG. 2, and the latch device 19 releases the latch state in response to the latch release operation force being inputted from the latch release operation force transmitting means 56 in the state in which the rotational force is transmitted from the cylinder lock 17, whereby the front side door D can be opened.

[0030] Next, an operation of the first embodiment will be explained. The operation member 24 is urged to the non-operation position side by the first springs 25, and when the operation member 24 is operated to the second operation position to which the operation amount from the non-operation position is made larger than that to the first operation position, the latch release operation force is mechanically transmitted to the latch device 19 from the latch release operation force transmitting means 56, but the rotary lever 27 which constitutes a part of the latch release operation force transmitting means 56 to rotate by being linked with the operation of the operation member 24 from the first operation position to the second operation position is urged to the non-rotation position side by the second spring 28, whereby at the normal operation time when the operation member 24 is operated to the first operation position, only the spring force of the first springs 25 acts on the operation member 24, and thus operation of the operation member 24 can be performed lightly. Meanwhile, at the emergency operation time when the operation member 24 is further operated to the

second operation position side from the first operation position, the operation member 24 and the rotary lever 27 are linked with each other, and the spring force of the second spring 28 acts on the operation member 24 in addition to the spring force of the first springs 25, and the operation becomes heavy as compared with that at the normal operation time. Accordingly, an obvious difference occurs between the operation loads at the time of a normal operation and at the time of an emergency operation, and an unnecessary emergency operation can be prevented from being performed at a normal operation time, whereby operability can be enhanced.

[0031] In the above described first embodiment, the constitution in which a pair of the first springs 25 are provided between the operation member 24 and the case 23 is adopted, but the constitution also can be adopted, in which a single first spring 25 is provided between the operation member 24 and the case 23.

[0032] A second embodiment of the present invention will be described with reference to FIGS. 12 to 14. The portions which correspond to those of the above described first embodiment are only illustrated by being assigned with the same reference numerals and characters, and the detailed description thereof will be omitted.

[0033] A decorative cover 69 which closes an opening portion 67 which is provided at the outer panel 15 of the front side door D and forms a recessed portion 68 which is recessed inward from the outer surface of the outer panel 15 is mounted to the front side door D, and latch release operation means 16B, the cylinder lock 17 and the rock switch 18 are placed on the decorative cover 69.

[0034] The latch release operation means 16B includes a case 70 which is integrally provided at the decorative cover 69, the operation member 24 which is slidably fitted in the case 70 to be movable in the up-down direction, a single first spring 25 which is provided between the operation member 24 and the case 70, the switch 26 which is mounted to the case 70 to be made electrically continuous in response to movement of the operation member 24 from the non-operation position, the rotary lever 27 which is rotatably supported at the case 70, and the second spring 28 which is provided between the rotary lever 27 and the case 70, and is constructed similarly to the latch release operation means 16A of the first embodiment.

[0035] Further, the antenna 35 is fixed to an inner surface side of the decorative cover 69 below the latch release operation means 16B, and a cover 71 which hides the cylinder lock 17 from the surface of the decorative cover 69 is attachably and detachably mounted to the decorative cover 69.

[0036] According to the second embodiment, the latch release operation means 16B, the cylinder lock 17 and the lock switch 18 are placed on the decorative cover 69, and therefore, assembly to the front side door D can be performed in a state in which the latch release operation means 16B, the cylinder lock 17 and the lock switch 18 are assembled in advance to the decorative cover 69,

whereby assembling becomes easy.

[0037] Embodiments of the present invention are explained above, but the present invention is not limited to the above-mentioned embodiments and may be modified in a variety of ways as long as the modifications do not depart from the gist of the present invention.

[0038] A latch release device for a vehicle door includes: an operation member (24); a first spring (25) that urges the operation member (24) to a non-operation position side; a switch (26) that is connected to an electric actuator (50) so as to be made electrically continuous in response to an operation of the operation member (24) from the non-operation position to a first operation position; and latch release operation force transmitting means (56) that mechanically transmits a latch release operation force to a latch device (19) in response to an operation of the operation member (24) to a second operation position. In the latch release device, a rotary lever (27) that constitutes part of the latch release operation force transmitting means (56) to rotate by being linked with an operation of the operation member (24) from the first operation position to the second operation position is urged by a second spring (28) to a non-rotation position side. Accordingly, it is possible to avoid an unnecessary emergency operation by generating an obvious difference in operation loads at a time of a normal operation and at a time of an emergency operation.

Claims

1. A latch release device for a vehicle door, comprising:

a latch device (19) that has an electric actuator (50) which operates to release a latch state of a vehicle door (D) and that also enables release of the latch state in response to a mechanical input of a latch release operation force;
an operation member (24);
a first spring (25) that urges the operation member (24) to a non-operation position side;
a switch (26) that is connected to the electric actuator (50) so as to be made electrically continuous in response to an operation of the operation member (24) from the non-operation position to a first operation position; and
latch release operation force transmitting means (56) that mechanically transmits a latch release operation force to the latch device (19) in response to an operation of the operation member (24) to a second operation position, an operation amount from the non-operation position to the second operation position being larger than an operation amount from the non-operation position to the first operation position,

characterized in that

the latch release device further comprises:

a rotary lever (27) that constitutes a part of the latch release operation force transmitting means (56) to rotate by being linked with an operation of the operation member (24) from the first operation position to the second operation position; and
a second spring (28) that urges the rotary lever (27) to a non-rotation position side.

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FIG.1

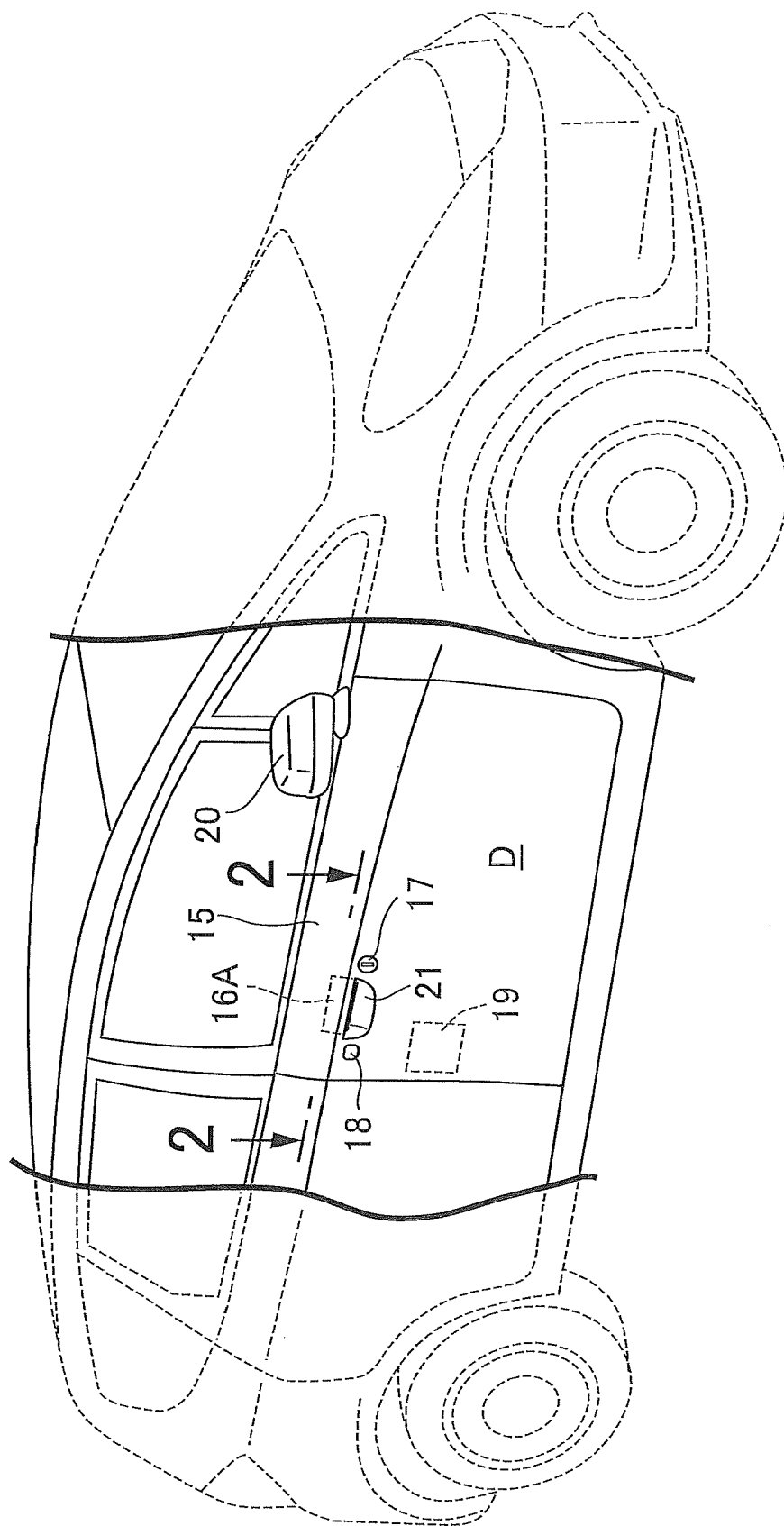
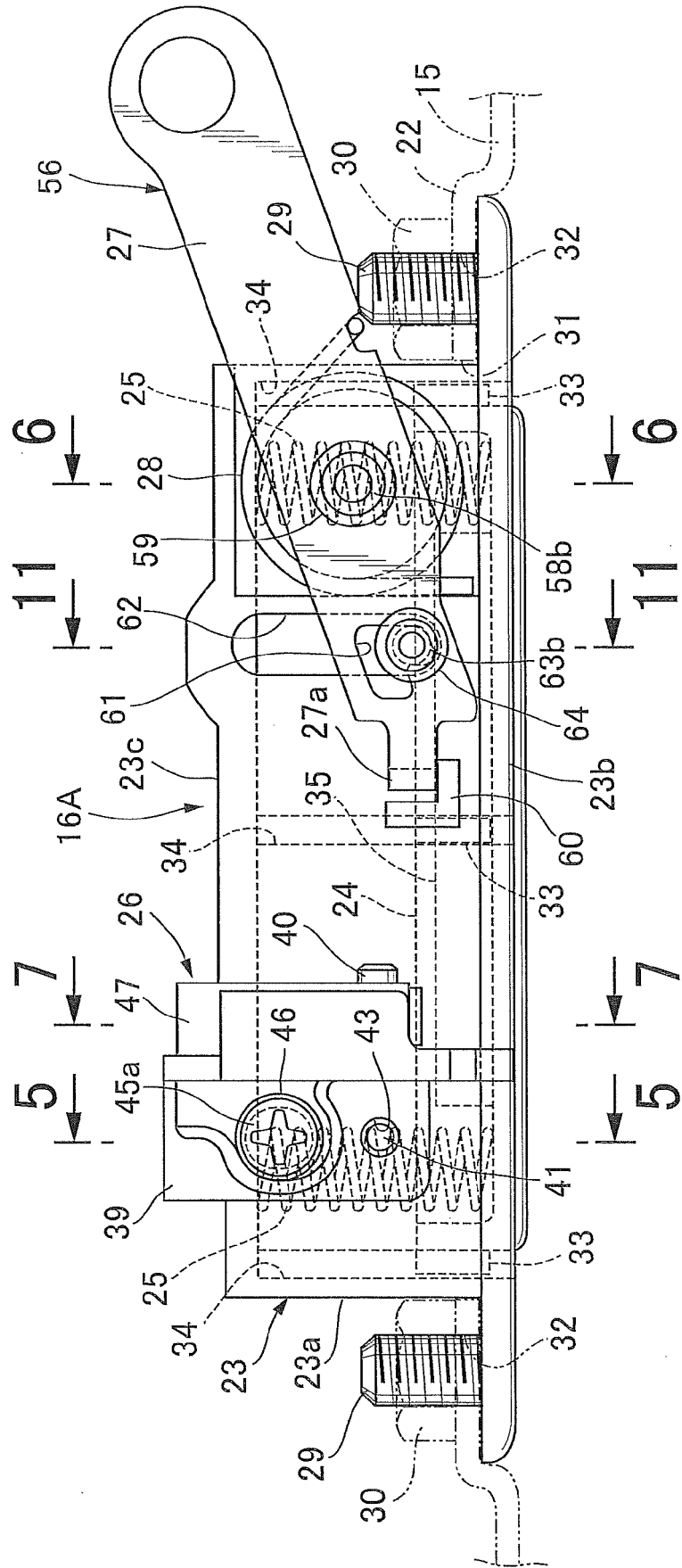


FIG.3



4.
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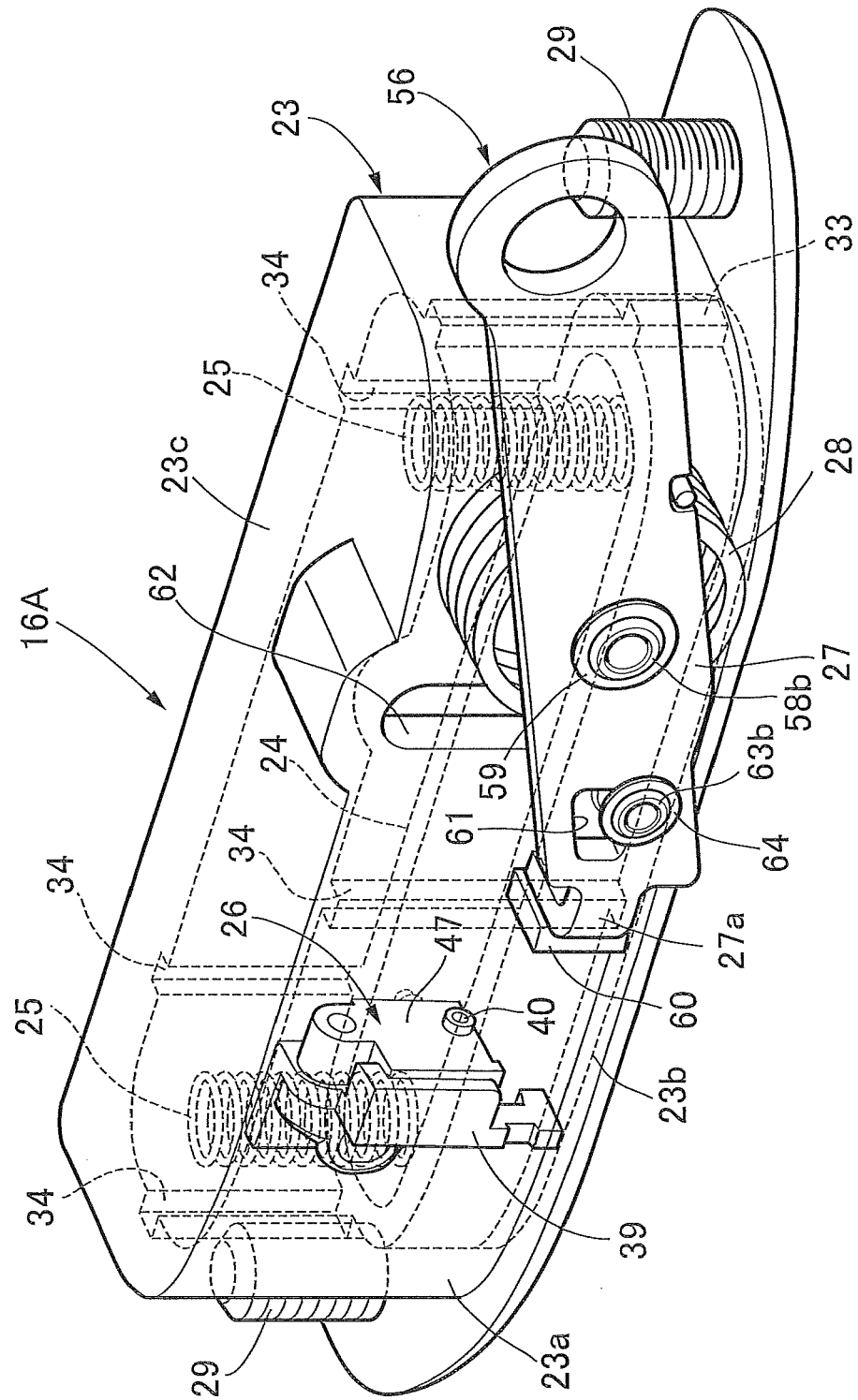


FIG.5

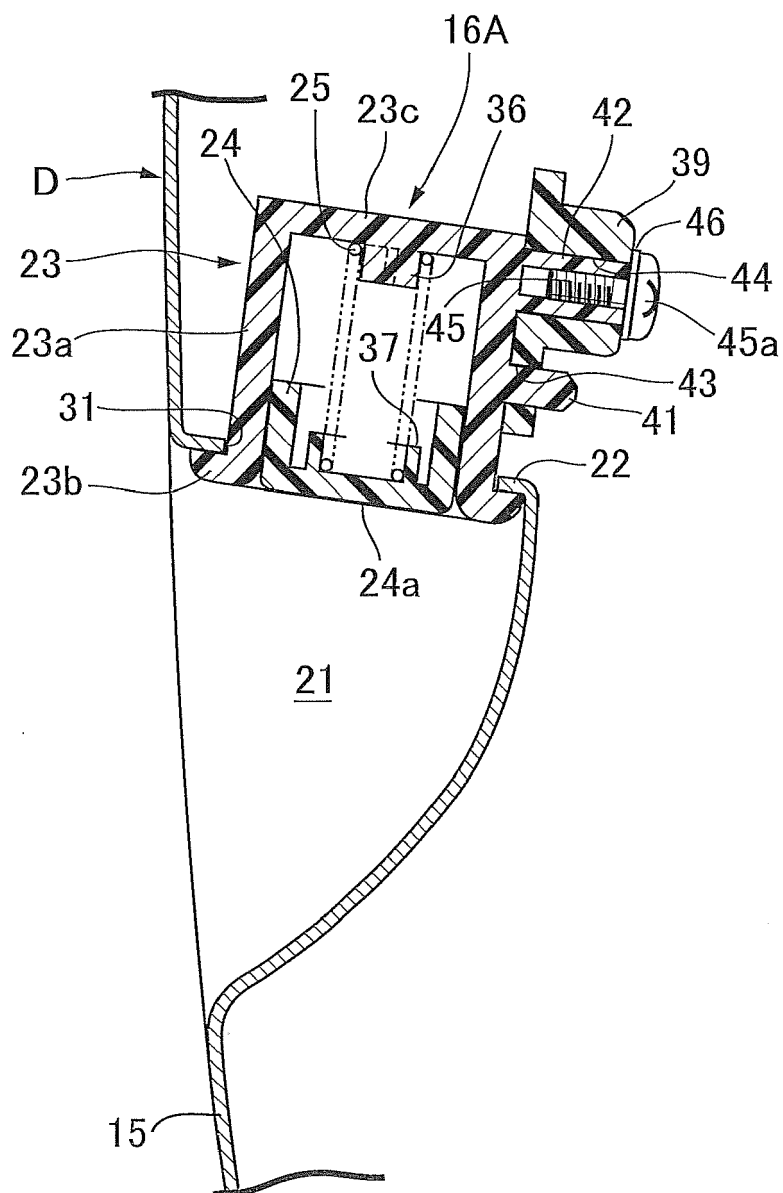


FIG. 6

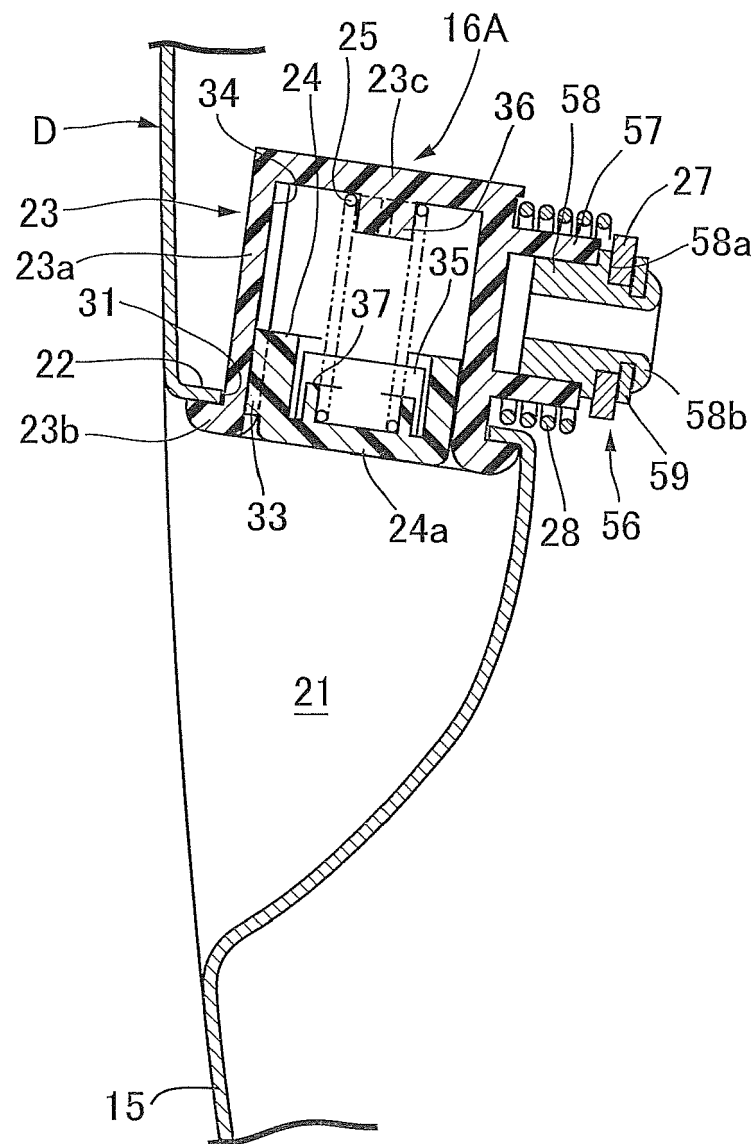


FIG.7

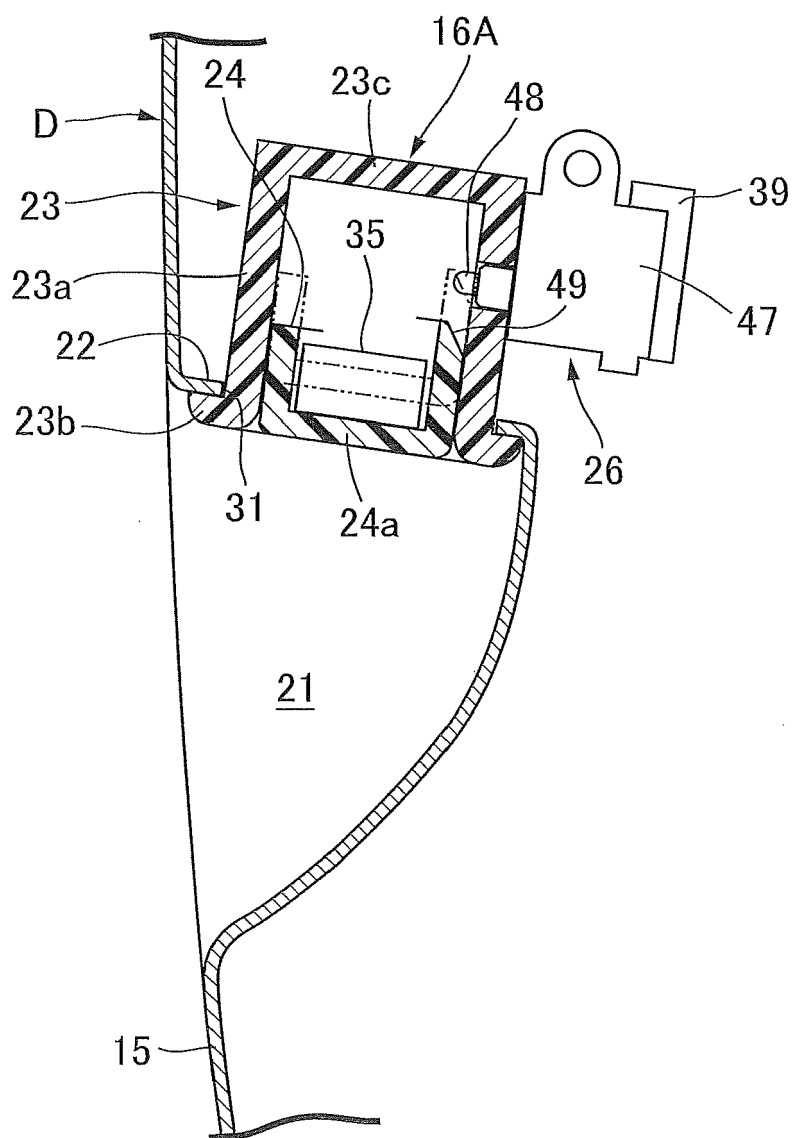


FIG.8

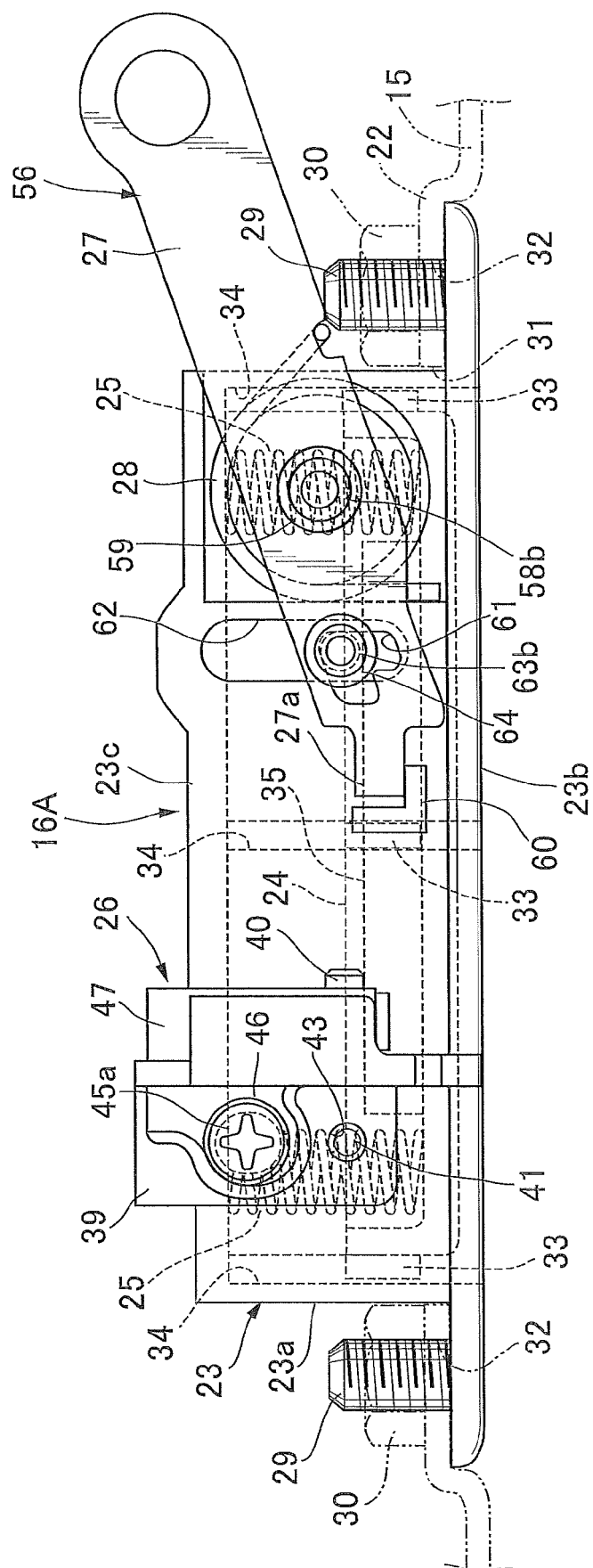


FIG.9

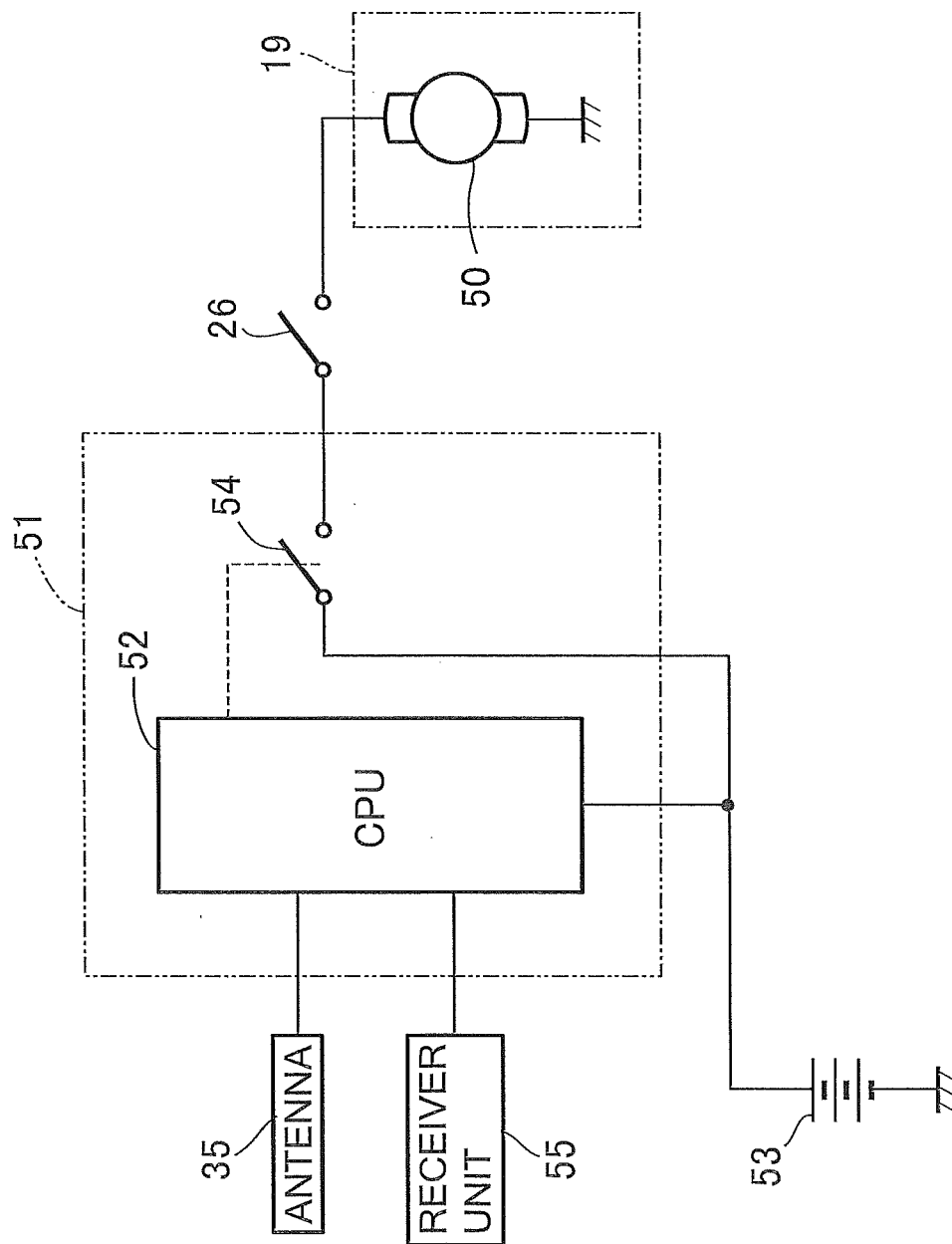


FIG. 10

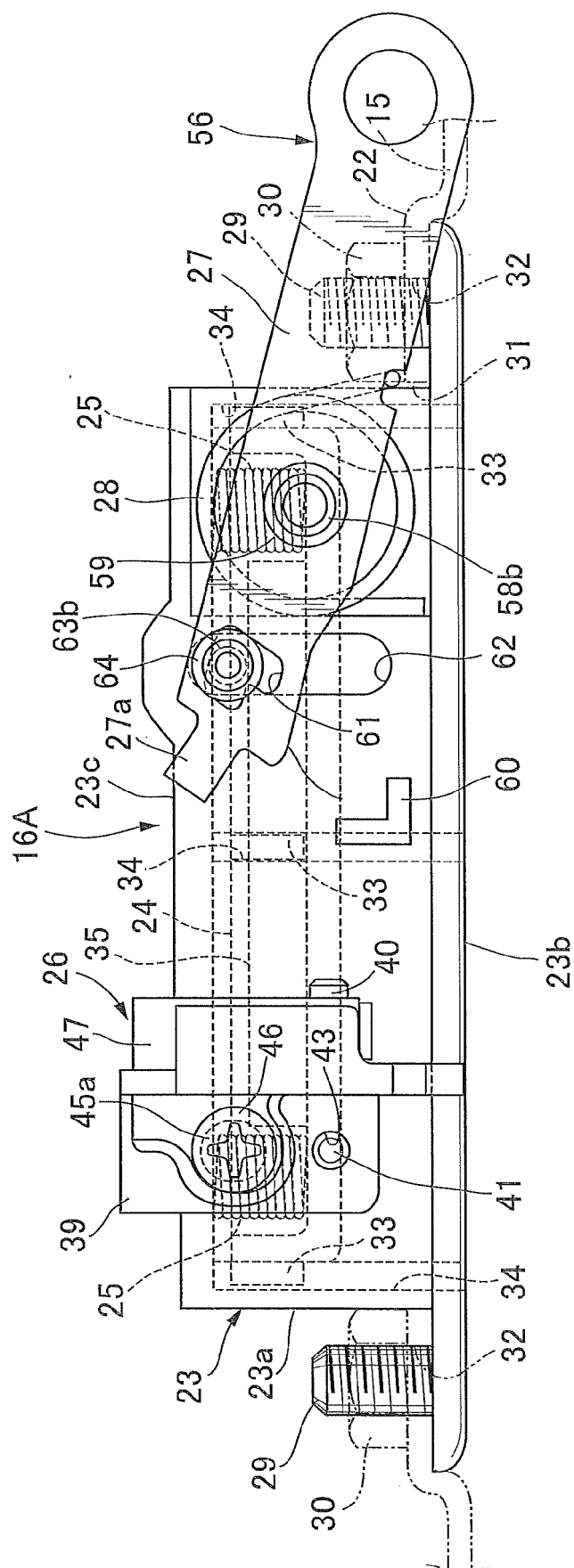


FIG. 11

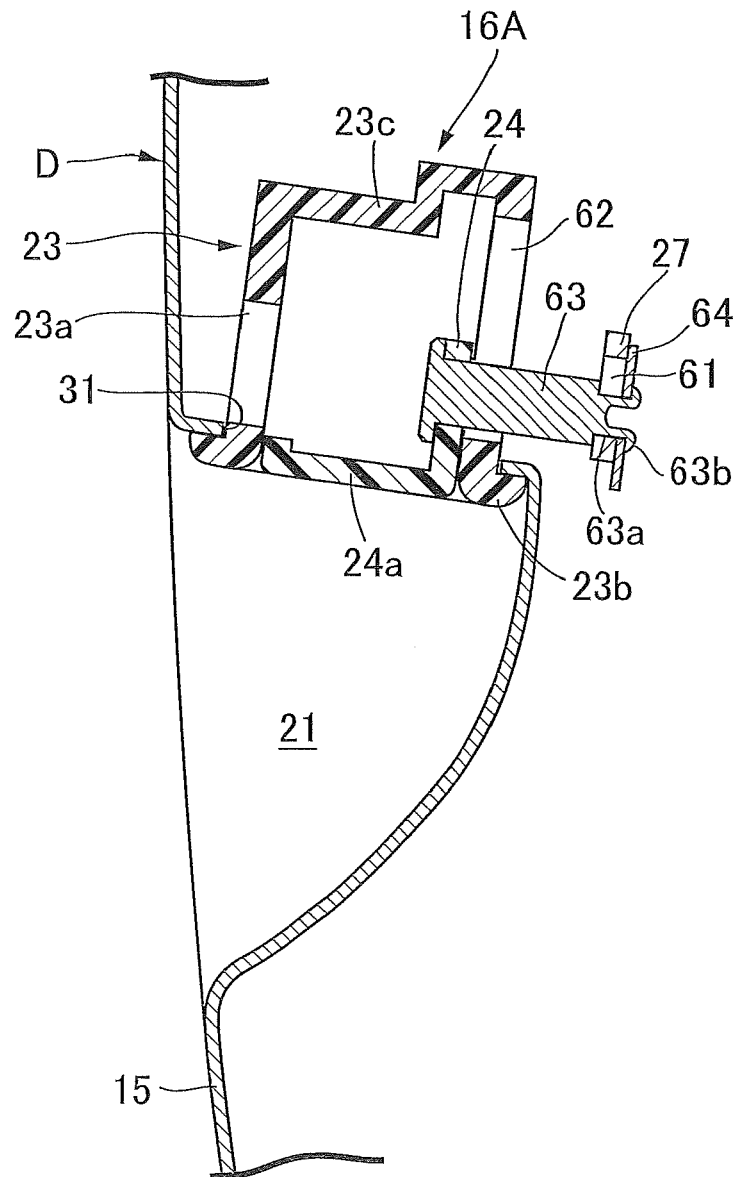
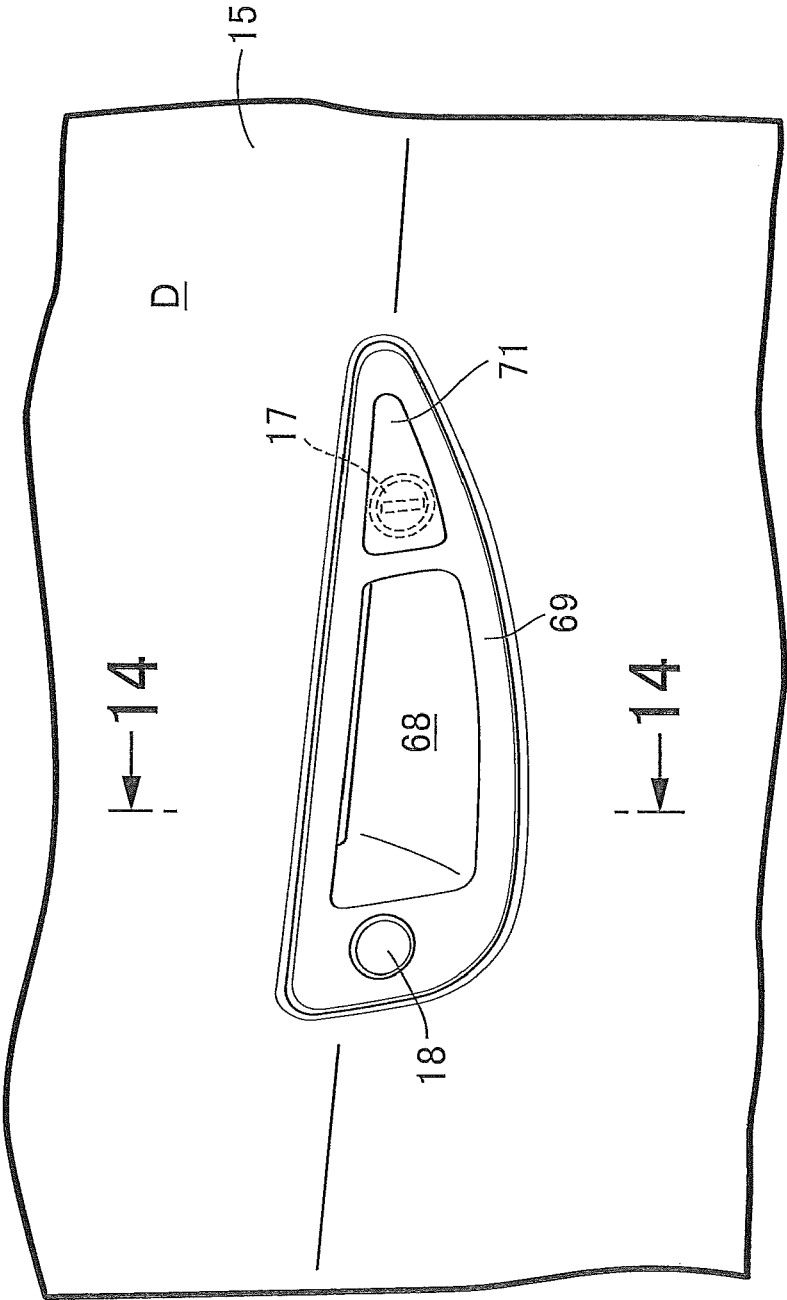


FIG.12



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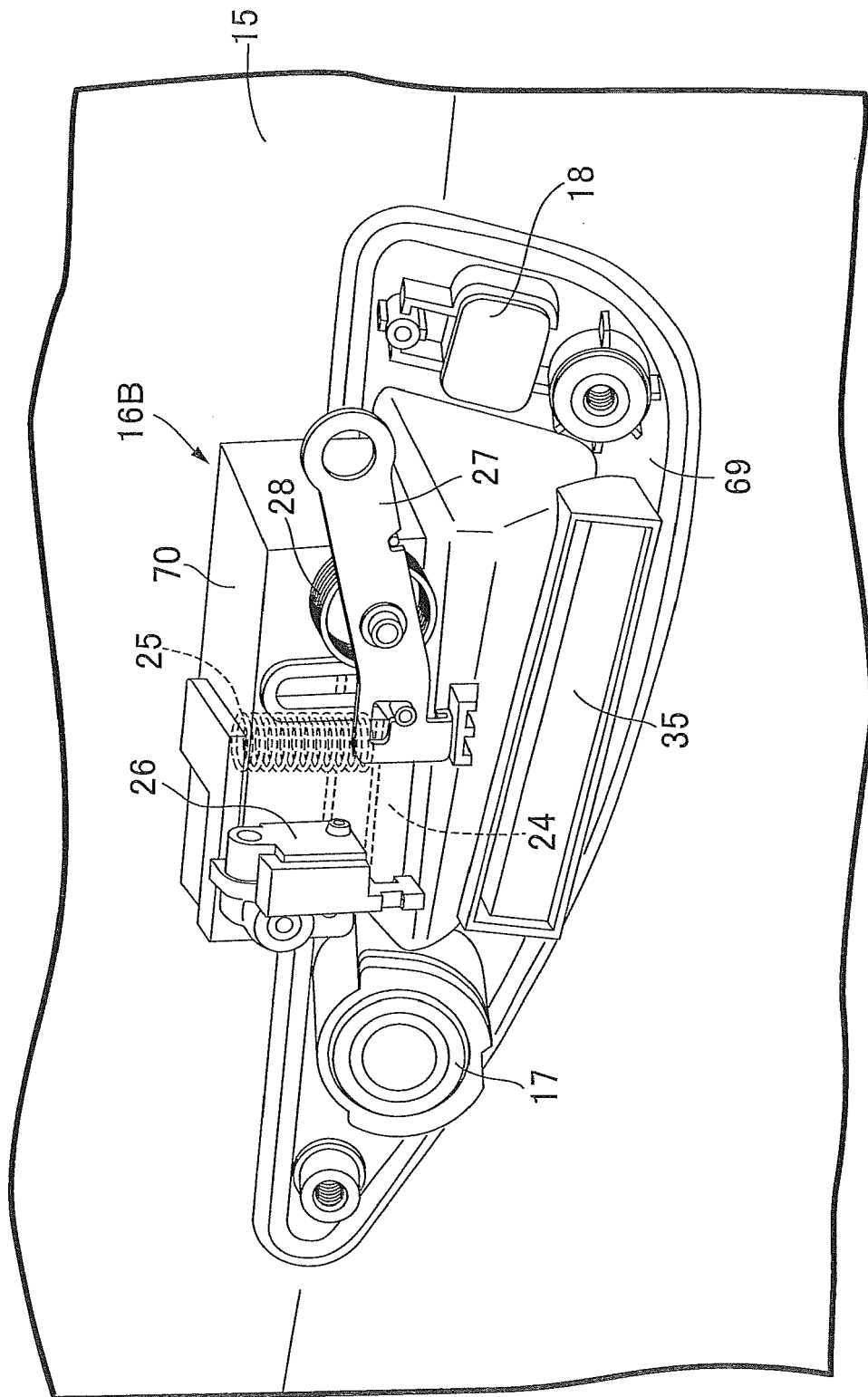
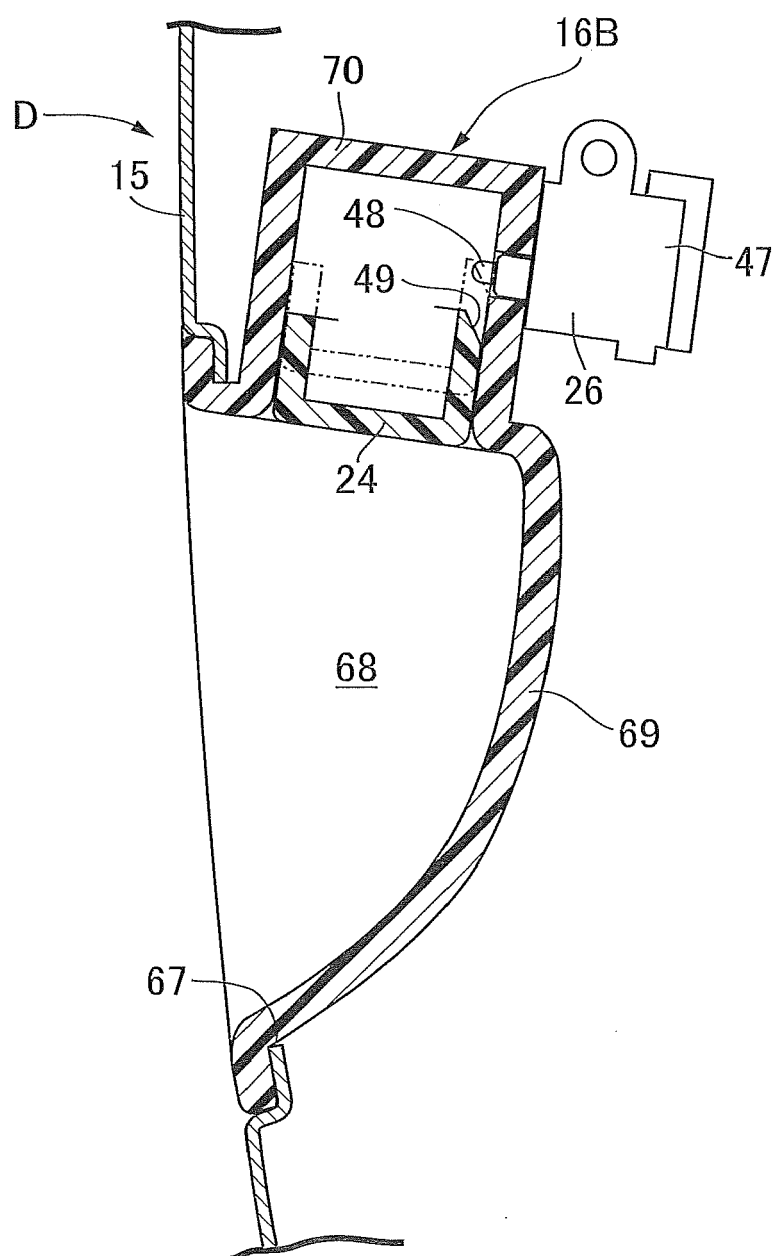


FIG. 14



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 6035091 A [0002] [0003]