

(19)



(11)

EP 3 219 888 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
20.09.2017 Bulletin 2017/38

(51) Int Cl.:
E05B 79/20 (2014.01) **E05B 77/34** (2014.01)
E05B 85/02 (2014.01) **E05B 15/16** (2006.01)
E05B 79/22 (2014.01)

(21) Application number: **17156816.5**

(22) Date of filing: **20.02.2017**

(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
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(71) Applicant: **AISIN SEIKI KABUSHIKI KAISHA**
Aichi 448-8650 (JP)

(72) Inventors:
• **NISHIO, Takashi**
Kariya-shi,, Aichi 448-8650 (JP)
• **MATSUMOTO, Ryota**
Kariya-shi,, Aichi 448-8650 (JP)

(30) Priority: **18.03.2016 JP 2016055137**

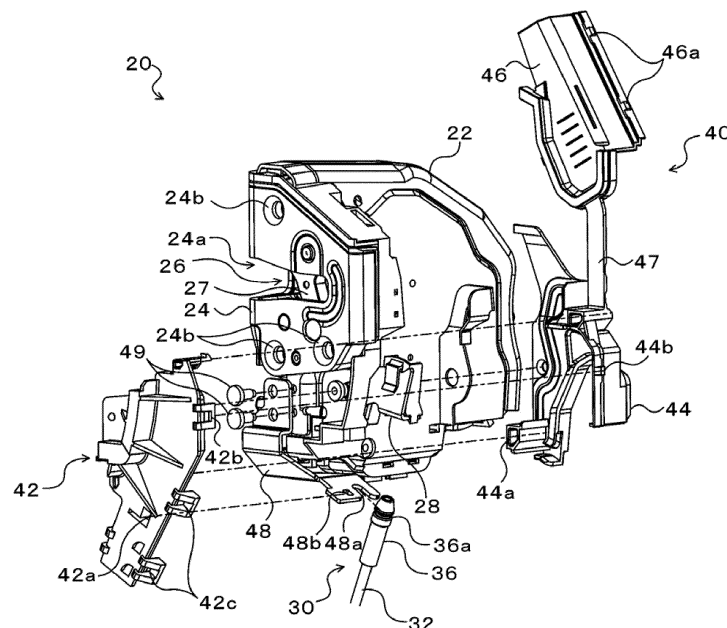
(74) Representative: **TBK**
Bavariaring 4-6
80336 München (DE)

(54) DOOR LATCH DEVICE FOR VEHICLE

(57) A door latch device (20) for the vehicle includes a main body (22), a lever member (28, 29) configured to release engagement between an engaged portion (100) and an engagement portion (27), a transmission cable (30, 31) including an outer casing (32) and an inner cable (34), the inner cable (34) being provided within the outer casing (32) and having a distal end portion (34a) that is exposed from the outer casing (32) and that is connected

to the lever member (28, 29), the transmission cable (30, 31) being configured to drive the lever member (28, 29) by transmitting an operation force applied from a door handle (15, 16) to the lever member (28, 29), a cover member (40) covering the inner cable (34) exposed from the outer casing (32), and a seal member (50) sealing at least the upper portion of the attachment portion between the cover member (40) and the main body (22).

FIG. 4



Description

TECHNICAL FIELD

[0001] This invention generally relates to a door latch device for a vehicle configured to maintain a door in a closed state such that an engagement portion provided within the door is engaged with an engaged portion provided at a vehicle body.

BACKGROUND DISCUSSION

[0002] A known door latch device for a vehicle is disclosed in JP 2013-83086 A. According to the teaching of JP 2013-83086 A, the door latch device for the vehicle is disengaged from a striker being provided at a vehicle body such that a transmission cable transmits an operation force of a door handle to an open lever to operate (rotate) the open lever. The door latch device disclosed in JP 2013-83086 A is fixed on a door in a state where a first outer surface having a striker receiving groove receiving the striker covers a door end wall and, a second outer surface in which an end of the striker receiving groove opens covers a door inner wall. A band-shaped seal member extending from a whole upper rim portion of the first outer surface covering the door end wall to a whole upper rim portion of the second outer surface covering the door inner wall is sandwiched by the first outer surface and the door end wall, and by the second outer surface and the door inner wall, in a pressurized state. Accordingly, for example, a connection end portion of the cable is prevented from getting wet only by an addition of the band-shaped seal member.

[0003] According to the door latch device for the vehicle disclosed in JP 2013-83086 A, although the band-shaped seal member provided at the upper rim portions of the first and second outer surfaces prevents water from entering from an upper side, it is difficult for the seal member to prevent water from entering in the door latch device for the vehicle from other directions, especially from a lower portion of the door latch device for the vehicle by a splash of water.

[0004] A need thus exists for a door latch device for a vehicle that enhances waterproof performance of an inside of a transmission cable with a simple structure.

SUMMARY OF THE INVENTION

[0005] It is the object of the invention to provide a door latch device for a vehicle which provides an enhanced waterproof performance.

[0006] The object of the invention is achieved by a door latch device for a vehicle having the features of claim 1.

[0007] Further advantageous developments of the invention are defined in the dependent claims.

[0008] According to an aspect of this invention, a door latch device for a vehicle is provided, which is configured to maintain a door in a closed state such that an engage-

ment portion provided within the door is engaged with an engaged portion provided at a vehicle body. The door latch device for the vehicle includes a main body containing the engagement portion and being fixed inside the door, a lever member configured to be driven in accordance with an operation of a door handle, the lever member being configured to release engagement between the engaged portion and the engagement portion, a transmission cable including an outer casing and an inner cable, the inner cable being provided within the outer casing and having a distal end portion that is exposed from the outer casing and that is connected to the lever member, the transmission cable being configured to drive the lever member by transmitting an operation force applied from the door handle to the lever member, a cover member in which at least an upper portion of the cover member is attached to the main body to cover the inner cable exposed from the outer casing, and a seal member sealing at least the upper portion of the attachment portion between the cover member and the main body.

[0009] Thus, according to the above configuration of the door latch device of the aspect of the invention, the cover member and the seal member prevent water from entering from the upper side. The cover member prevents water from entering from other direction caused by a splash of water.

[0010] Preferably, the seal member corresponds to a double-sided adhesive tape adhering the attachment portion between the cover member and the main body.

[0011] Accordingly, the seal member may attach and seal between the cover member and the main body. Accordingly, the mountability of the cover member to the main body is enhanced.

[0012] Preferably, one of the cover member and the main body includes a rib that is formed in a protruding shape, the rib extending along the attachment portion between the cover member and the main body to press the seal member.

[0013] Accordingly, the seal member is pressurized by the rib to enhance the adhesiveness of the cover member to the main body. Accordingly, the waterproof performance of the cover member is further enhanced.

[0014] Preferably, the cover member includes plural members. Mating surfaces of the plural members are sealed with one another by a labyrinth structure.

[0015] Thus, the mating surfaces may prevent water from entering. Accordingly, the waterproof performance of the cover member is further enhanced.

[0016] Preferably, the door latch device for the vehicle further includes a retaining groove being provided at the main body and retaining the outer casing, the retaining groove opening in a direction orthogonal to a mounting direction of the main body to the door.

[0017] Accordingly, the transmission cable is prevented from falling off when the door latch device for the vehicle is mounted on the door after being mounted on the body.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The foregoing and additional features, effects and characteristics of this invention will become more apparent from the following detailed description to be considered with reference to the accompanying drawings, wherein:

Fig. 1 is a schematic view illustrating a vehicle including a door latch device for a vehicle according to an embodiment according to the invention disclosed here;

Fig. 2 is a view illustrating a striker according to the embodiment;

Fig. 3 is an explanatory view illustrating the door latch device for the vehicle that is mounted on a door;

Fig. 4 is an exploded perspective view illustrating the door latch device for the vehicle;

Fig. 5 is an external perspective view illustrating an exterior of the door latch device for the vehicle when a lid portion of a waterproof cover is open;

Fig. 6 is an external perspective view illustrating the exterior of the door latch device for the vehicle when the lid portion of the waterproof cover is closed;

Fig. 7 is an explanatory view explaining a mounting direction of a cable and a mounting direction of a body;

Fig. 8A and Fig. 8B are external views each illustrating an exterior of the waterproof cover including a frame portion and the lid portion;

Fig. 9 is a cross-sectional view taken along a line IX-IX in Fig. 5; and

Fig. 10 is a cross-sectional view taken along a line X-X in Fig. 6.

DETAILED DESCRIPTION

[0019] An embodiment of this invention will hereunder be explained.

[0020] As shown in Figs. 1 and 2, a door latch device 20 for a device of an embodiment maintains a door 10 in a closed state relative to a vehicle body by engaging with a striker 100 (i.e., serving as an engaged portion) fixed on the vehicle body. The door latch device 20 for the vehicle is arranged within a space defined by an outside panel 11 and an inside panel 12 of the door 10 that is provided at a rear of the vehicle. As shown in Fig. 3 and as seen from an external view, the door latch device 20 for the vehicle includes a body 22 (i.e., serving as a main body), a base plate 24 mounted on the body 22, and a waterproof cover 40 (i.e., serving as a cover member) attached to the body 22.

[0021] The body 22 corresponds to a resin-made housing, and contains a latch mechanism 26, a lock mechanism, and a lever mechanism.

[0022] The base plate 24 corresponds to a metal-made plate, and as shown in Fig. 3, includes a striker containing groove 24a that can contain the striker 100. The base

plate 24 includes plural bolt holes 24b and is fixed on the door 10 by covering an end wall of the door 10 from an inner side, the end wall that is disposed opposite to a rotary center of the door 10, and such that bolts are threaded into the plural holes 24b from an outer side of the end wall.

[0023] The latch mechanism 26 corresponds to a mechanism for maintaining the door 10 in the closed state relative to the vehicle body, and includes a latch 27 (i.e., serving as an engagement portion) that can selectively engage with the striker 100. When the striker 100 enters into the striker containing groove 24a by the closing operation of the door 10, the latch 27 maintains the striker 100 in the striker containing groove 24a by being displaced to a latch position where the latch 27 is engaged with the striker 100 and by being prevented from being displaced to an unlatch position where the latch 27 releases the engagement from the striker 100 by a pawl. A helical torsion coil spring biases the latch 27 in a direction displacing the latch 27 from the latch position to the unlatched position. When the lever mechanism operates to release the prevention of the displacement by the pawl, the latch 27 is disengaged from the striker 100 by being displaced to the unlatch position by the biasing force of the helical torsion coil spring.

[0024] The lever mechanism includes an outside open lever 28 (i.e., serving as a lever member) and an inside open lever 29 (i.e., serving as a lever member). The outside open lever 28 is driven by an operation force applied from an outside door handle 16 (i.e., serving as a door handle). The inside open lever 29 is driven by an operation force applied from an inside door handle 15 (i.e., serving as a door handle). The outside open lever 28 is operatively connected to the outside door handle 16 via a transmission cable 30 serving as an operation force transmission member. The outside open lever 28 is driven by an operation force transmitted from the outside door handle 16 via the transmission cable 30. As shown in Fig. 2, the outside door handle 16 is disposed at an upper position of the door 10 and across a division bar (a partition) 14 that is disposed at a rear portion of a door window 13. The inside open lever 29 is operatively connected to the inside door handle 15 via the operation force transmission member, for example, a transmission cable 31, and operates by the operation force transmitted from the inside door handle 15 via the operation force transmission member. When the outside open lever 28 and the inside open lever 29 operate by the operation forces of the outside door handle and the inside door handle 15, respectively, the latch 27 is displaced from the latch position to the unlatch position, and is disengaged from the striker 100.

[0025] The lock mechanism is disposed between the latch mechanism 26 and the lever mechanism, and switches between an unlock state and a lock state. The unlock state corresponds to a state where the lock mechanism releases engagement between the latch mechanism 26 and the striker 100 by transmitting the drive force

of the lever mechanism to the pawl. The lock state corresponds to a state where the lock mechanism does not release engagement between the latch mechanism 26 and the striker 100 by not transmitting the drive force of the lever mechanism to the pawl. The lock mechanism is operated by a key cylinder provided at a vehicle outer side and by the operation force of a lock knob being provided at a vehicle inner side. Alternatively, the lock mechanism is operated by the drive force of an electric actuator.

[0026] The transmission cable 30 corresponds to a push-pull cable connecting the outside door handle 16 to the outside open lever 28. As shown in Figs. 3 to 5, the transmission cable 30 includes a tubular outer casing 32, an inner cable 34 (see Fig. 4), and a casing cap 36. The inner cable 34 is provided in the outer casing 32. The casing cap 36 is swaged at an end portion of the outer casing 32.

[0027] A distal end portion 34a of the inner cable 34 exposed from the outer casing 32 is formed in a spherical shape, and is retained at the outside open lever 28 by being inserted into a retaining groove 28a provided at the outside open lever 28.

[0028] As shown in Fig. 3, the casing cap 36 is provided with a groove 36a at a whole periphery of the casing cap 36, and is fixed on a bracket 48 by being inserted into a retaining groove 48a provided at the bracket 48. The bracket 48 is fixed on a body 22 by vises 49.

[0029] The body 22 is mounted on the door 10 in a left direction in Fig. 6. Meanwhile, the outer casing 32 (the casing cap 36) is fixed to the body 22 by being inserted into the retaining groove 48a from an outer position to an inner position of the bracket 48, the retaining groove 48a opening from the inner position to the outer position of the bracket 48 shown in Fig. 6. The door latch device 20 for the vehicle is mounted on the door 10 such that the body 22 (the base plate 24) is mounted on the door 10 after the transmission cable 30 is mounted on the body 22 (the bracket 48). As described above, because the door 10 is provided with an object (for example, the division bar 14) that may be an obstacle when the door latch device 20 for the vehicle is mounted on the door 10, the transmission cable 30 may fall off by being pulled by the obstacle when the transmission cable 30 is mounted on the body 22 (the bracket 48) in a state where the transmission cable 30 is mounted on the body 22 (the bracket 48). According to the embodiment, because the mounting direction of the outer casing 32 (the casing cap 36) corresponds to a direction orthogonal to, or substantially orthogonal to the mounting direction of the body 22 (the base plate 24) to the door 10, the transmission cable 30 is prevented from falling off when being mounted on the door 10.

[0030] As shown in Figs. 3 to 5, the waterproof cover 40 (i.e., serving as a cover member) covers the inner cable 34 and the casing cap 36 exposed from the outer casing 32, and is attached to the body 22. The waterproof cover 40 corresponds to a resin-made cover, and in-

cludes a bottom portion 42 (i.e., serving as a member), a frame portion 44 (i.e., serving as a member), and a lid portion 46 (i.e., serving as a member) that are mated with one another. According to the embodiment, the waterproof cover 40 is configured such that the frame portion 44 and the lid portion 46 are integrally provided via a connection portion 47. The waterproof cover 40 is provided with two members that are a first cover corresponding to the bottom portion 42, and a second cover corresponding to the frame portion 44 and the lid portion 46 (see Fig. 7).

[0031] As shown in Fig. 3, the bottom portion 42 includes an retaining pawl 42a, and is fixed on the bracket 48, that is, on the body 22, such that the retaining pawl 42a is retained by a retaining hole 48b being provided at the bracket 48.

[0032] As shown in Fig. 3, the frame portion 44 includes an engagement portion 44a and a retaining pawl 44b, and is attached to the bottom portion 42 such that an engagement portion provided at the bottom portion 42 and the retaining hole 42b are engaged with the engagement portion 44a and the retaining pawl 44b, respectively. As shown in Fig. 4, the frame portion 44 includes an attachment surface 44c extending upwardly (in the upper direction in Fig. 4) and sidewardly (in the right direction in Fig. 4) from a side wall surrounding the inner cable 34. The attachment surface 44c is attached to the body 22 by having a seal member 50 therebetween.

[0033] According to the embodiment, the seal member 50 corresponds to an elastic double-sided adhesive tape having adhesive layers on the front and back side of the seal member 50. The attachment surface 44c of the frame portion 44 is adhered to the body 22 by the double-sided adhesive tape. As shown in Figs. 7 and 8, a rib 44d that is formed in a protruding, band-shape is provided along the attachment surface 44c. Because the seal member 50 is pressurized by the rib 44d of the frame 44, the adhesiveness of the attachment surface 44c is enhanced.

[0034] As shown in Figs. 3, 5 and 6, the lid portion 46 is provided with retaining pawls 46a. The lid portion 46 is attached to the bottom portion 42 such that the retaining pawls 46a are retained by retaining holes 42c provided at the bottom portion 42 to close an opening of the frame portion 44. As shown in Fig. 9, respective mating surfaces of the bottom portion 42, the frame portion 44, and the lid portion 46 are formed in a labyrinth structure to prevent water from entering. That is, each of the respective mating surfaces includes two bending portions in a mating direction, and two surfaces orthogonal to, or substantially orthogonal to each other come in contact with each other.

[0035] According to the door latch device 20 for the vehicle of the embodiment, the waterproof cover 40 covering the inner cable 34 exposed from the outer casing 32 is attached to the body 22 at the upper portion of the waterproof cover 40, and includes the seal member 50 (the double-sided seal) sealing the attachment surfaces of the water proof cover 40 and of the body 22. Thus, the

waterproof cover 40 and the seal member 50 may prevent water from entering from the upper side. The waterproof cover 40 may prevent water from entering from other direction caused by a splash of water.

[0036] According to the door latch device 20 for the vehicle of the embodiment, because the seal member 50 corresponds to the double-sided seal, the seal member 50 may attach and seal between the waterproof cover 40 and the body 22. Accordingly, the mountability of the waterproof cover 40 to the body 22 may be enhanced.

[0037] According to the door latch device 20 for the vehicle of the embodiment, because the rib 44d is provided along the attachment surface 44c (the seal member 50) of the waterproof cover 40 attached to the body 22, the seal member 50 is pressurized by the rib 44d to enhance the adhesiveness of the waterproof cover 40 to the body 22. Accordingly, the waterproof performance of the waterproof cover 40 may be further enhanced.

[0038] According to the door latch device 20 for the vehicle of the embodiment, because the waterproof cover 40 is configured such that the bottom portion 42, the frame portion 44 and the lid portion 46 are mated with one another, and because each of the mating surfaces of the bottom portion 42, the frame portion 44 and the lid portion 46 is formed in the labyrinth structure, the mating surfaces may prevent water from entering. Accordingly, the waterproof performance of the waterproof cover 40 may be further enhanced.

[0039] According to the door latch device 20 for the vehicle of the embodiment, because the transmission cable 30 (the outer casing 32) is mounted on the direction orthogonal to, or substantially orthogonal to the mounting direction of the door latch device 20 for the vehicle to the door 10, the transmission cable 30 is prevented from falling off when the door latch device 20 for the vehicle is mounted on the door 10 after being mounted on the body 22.

[0040] According to the door latch device 20 for the vehicle of the embodiment, the waterproof cover 40 that covers the transmission cable 30 connecting the outside door handle 16 and the outside open lever 28 is explained. The waterproof cover 40 may also cover the transmission cable 31 that connects the inside door handle 15 and the inside open lever 29.

[0041] According to the door latch device 20 for the vehicle of the embodiment, the waterproof cover 40 is provided with the two members that are the first cover including the bottom portion 42 and the second cover including the frame portion 44 and the lid portion 46. Alternatively, the waterproof cover 40 may be provided with three or more than three members, for example, such that the frame portion 44 and the lid portion 46 are separately provided. Alternatively, the waterproof cover 40 may be provided with one member such that the bottom portion 42, the frame portion 44, and the lid portion 46 are integrally provided.

[0042] According to the door latch device 20 for the vehicle of the embodiment, the seal member 50 serves

as the double-sided seal having the adhesive layers on the front and back side of the seal member 50. Alternatively, the seal member 50 may correspond to an elastic member that does not include adhesive layers. In this case, the waterproof cover 40 may be mechanically attached to the body 22 by, for example, vises.

[0043] According to the door latch device 20 for the vehicle of the embodiment, the rib 44d is provided at the attachment surface 44c of the waterproof cover 40 (the frame portion 44). Alternatively, a rib may be provided at an attachment surface of the body 22. Alternatively, a rib does not have to be provided.

[0044] According to the embodiment, the transmission cable 30 (the outer casing 32) is mounted on the door latch device 20 for the vehicle in the direction orthogonal to, or substantially orthogonal to the mounting direction of the door latch device 20 for the vehicle to the door 10. Alternatively, the transmission cable 30 may be mounted in any directions.

[0045] According to the embodiment, the door latch device 20 for the vehicle may be mounted on the door 10 that is provided at the rear portion of the vehicle. Alternatively, the door latch device 20 for the vehicle may be mounted on a door that is provided at the front portion of the vehicle. The door latch device 20 for the vehicle may be mounted on any doors as long as it is a door for a vehicle.

[0046] The invention is applicable to a manufacturing industry of a door latch device for a vehicle.

[0047] A door latch device (20) for the vehicle includes a main body (22), a lever member (28, 29) configured to release engagement between an engaged portion (100) and an engagement portion (27), a transmission cable (30, 31) including an outer casing (32) and an inner cable (34), the inner cable (34) being provided within the outer casing (32) and having a distal end portion (34a) that is exposed from the outer casing (32) and that is connected to the lever member (28, 29), the transmission cable (30, 31) being configured to drive the lever member (28, 29) by transmitting an operation force applied from a door handle (15, 16) to the lever member (28, 29), a cover member (40) covering the inner cable (34) exposed from the outer casing (32), and a seal member (50) sealing at least the upper portion of the attachment portion between the cover member (40) and the main body (22).

Claims

1. A door latch device (20) for a vehicle configured to maintain a door (10) in a closed state such that an engagement portion (27) provided within the door (10) is engaged with an engaged portion (100) provided at a vehicle body, the door latch device (20) for the vehicle comprising:

a main body (22) containing the engagement portion (27) and being fixed inside the door (10);

- a lever member (28, 29) configured to be driven in accordance with an operation of a door handle (15, 16), the lever member (28, 29) being configured to release engagement between the engaged portion (100) and the engagement portion (27); 5
- a transmission cable (30, 31) including an outer casing (32) and an inner cable (34), the inner cable (34) being provided within the outer casing (32) and having a distal end portion (34a) that is exposed from the outer casing (32) and that is connected to the lever member (28, 29), the transmission cable (30, 31) being configured to drive the lever member (28, 29) by transmitting an operation force applied from the door handle (15, 16) to the lever member (28, 29); 10
- a cover member (40) in which at least an upper portion of the cover member (40) is attached to the main body (22) to cover the inner cable (34) exposed from the outer casing (32); and 15
- a seal member (50) sealing at least the upper portion of the attachment portion between the cover member (40) and the main body (22). 20
2. The door latch device (20) for the vehicle according to claim 1, wherein the seal member (50) corresponds to a double-sided adhesive tape adhering the attachment portion between the cover member (40) and the main body (22). 25
3. The door latch device (20) for the vehicle according to either claim 1 or 2, wherein one of the cover member (40) and the main body (22) includes a rib (44d) that is formed in a protruding shape, the rib (44d) extending along the attachment portion between the cover member (40) and the main body (22) to press the seal member (50). 30
4. The door latch device (20) for the vehicle according to one of claims 1 to 3, wherein 35
- the cover member (40) includes a plurality of members (42, 44, 46); and
- mating surfaces of the plurality of members (42, 44, 46) are sealed with one another by a labyrinth structure. 40
5. The door latch device (20) for the vehicle according to one of claims 1 to 4, further comprising: 45
- a retaining groove (48a) being provided at the main body (22) and retaining the outer casing (32), the retaining groove (48a) opening in a direction orthogonal to a mounting direction of the main body (22) to the door (10). 50
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FIG. 1

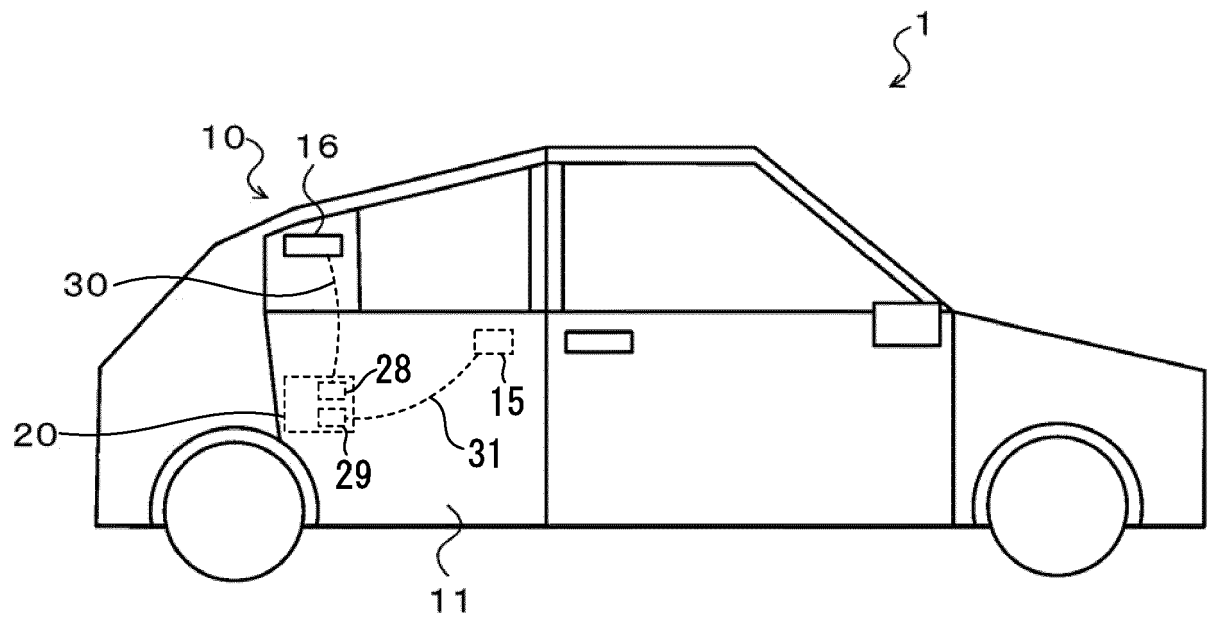


FIG. 2

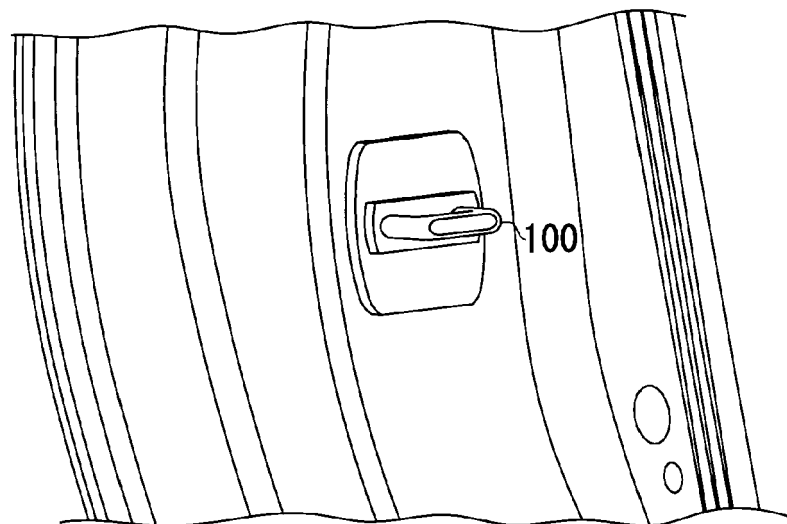


FIG. 3

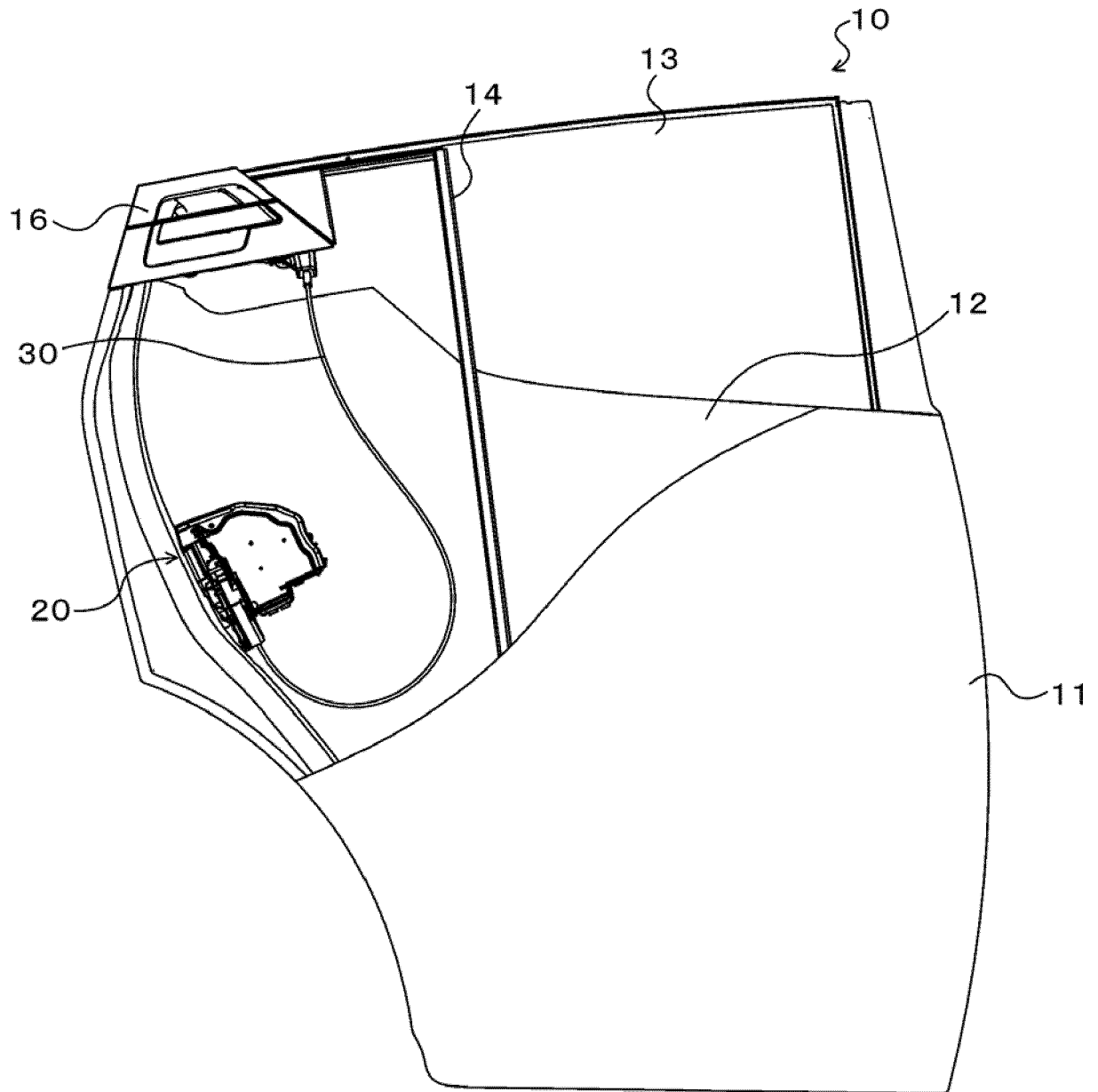


FIG. 4

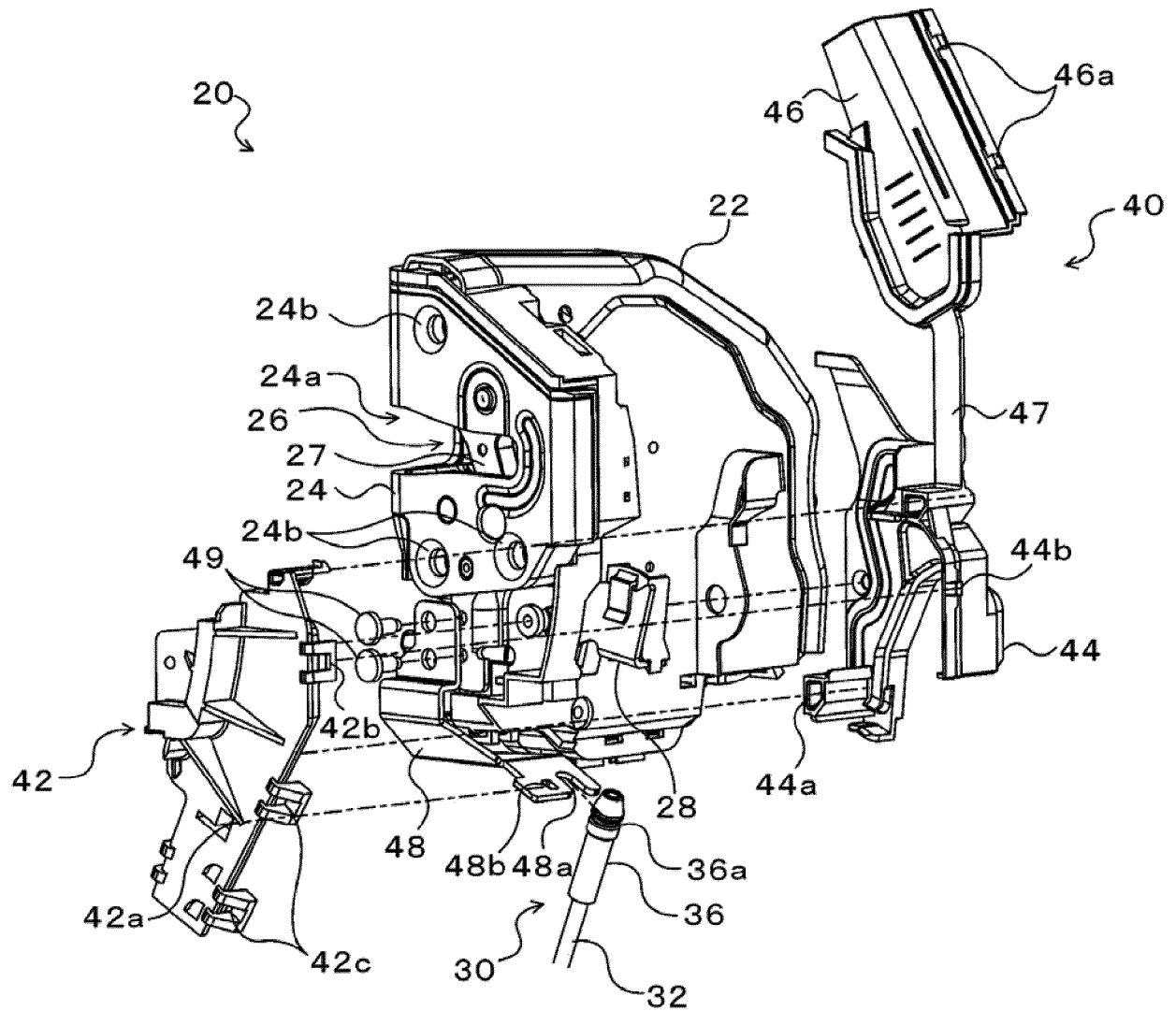


FIG. 5

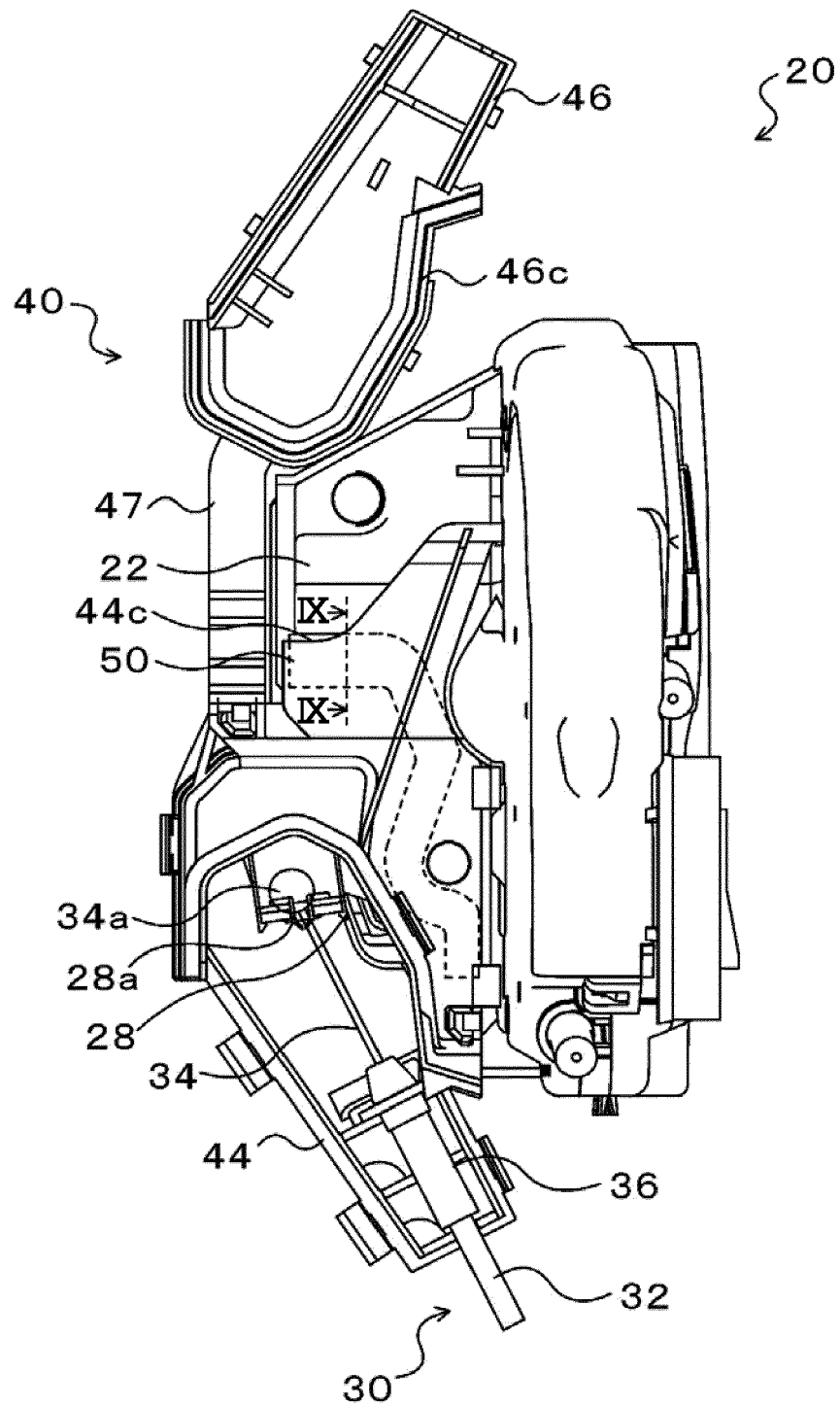


FIG. 6

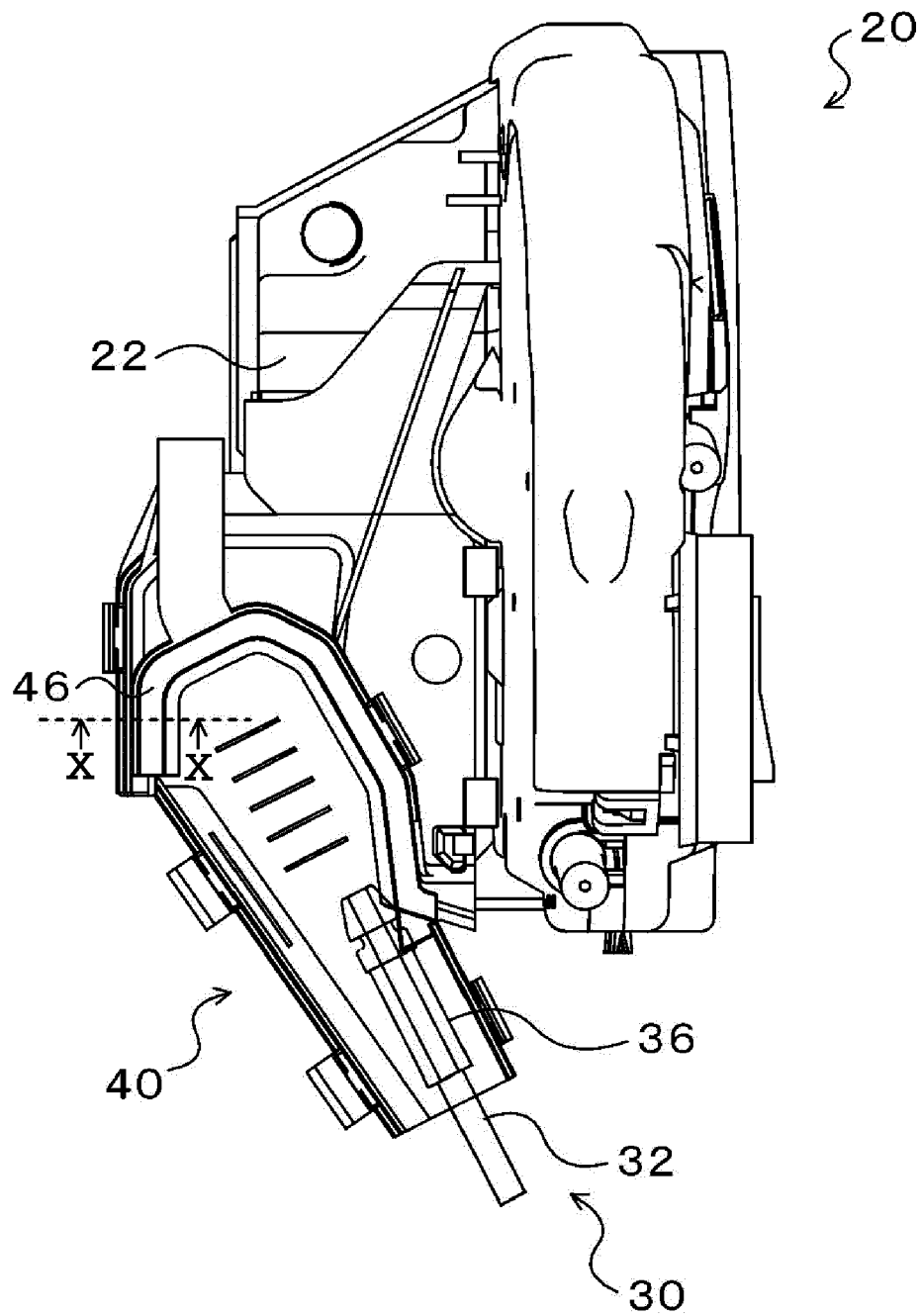


FIG. 7

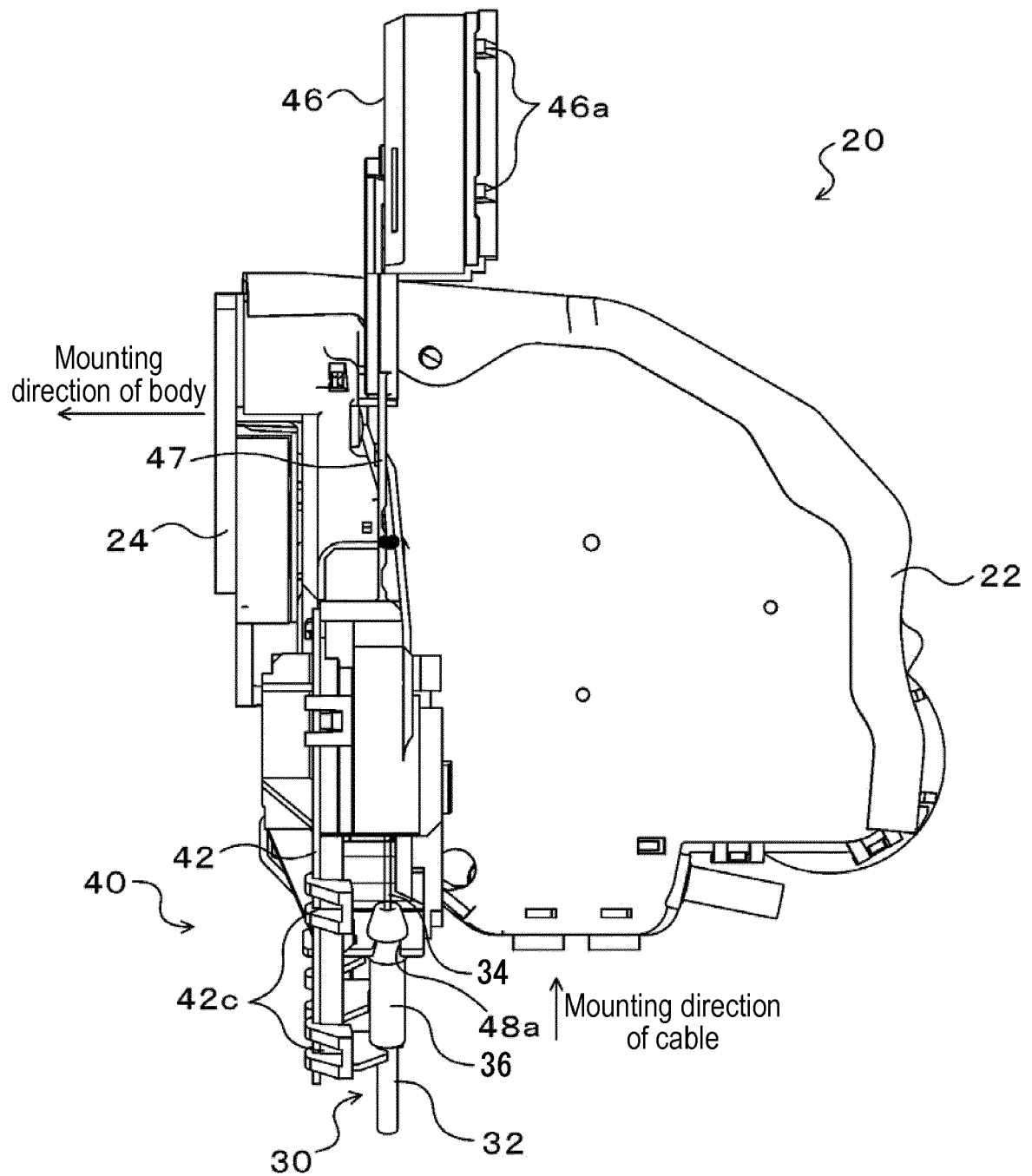


FIG. 8 A

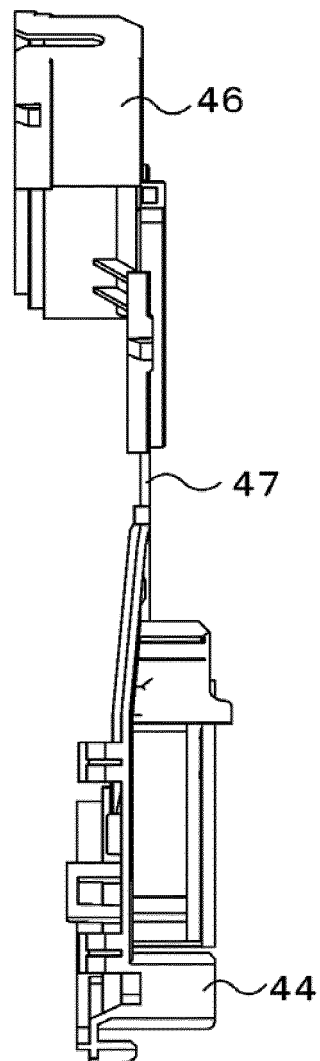


FIG. 8 B

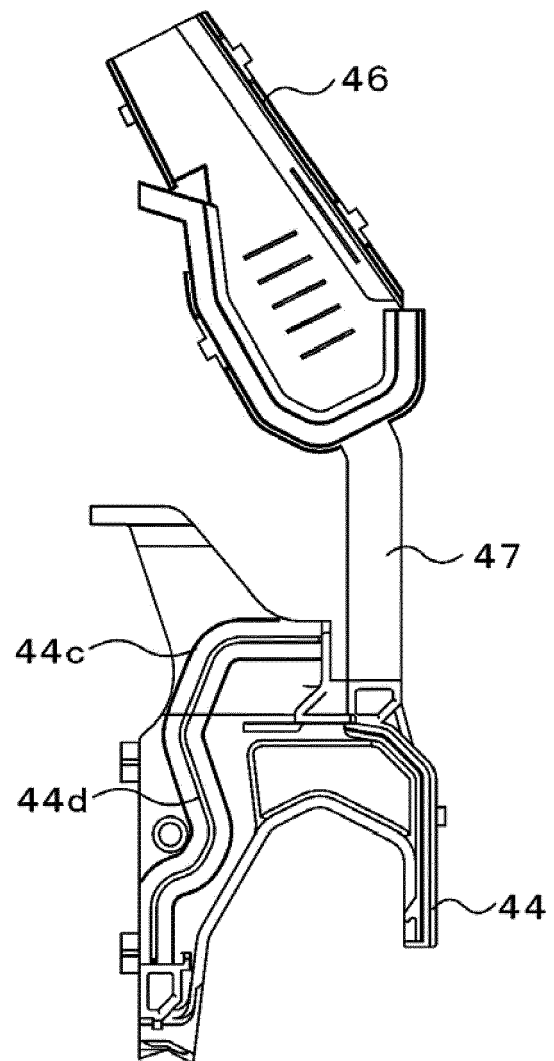


FIG. 9

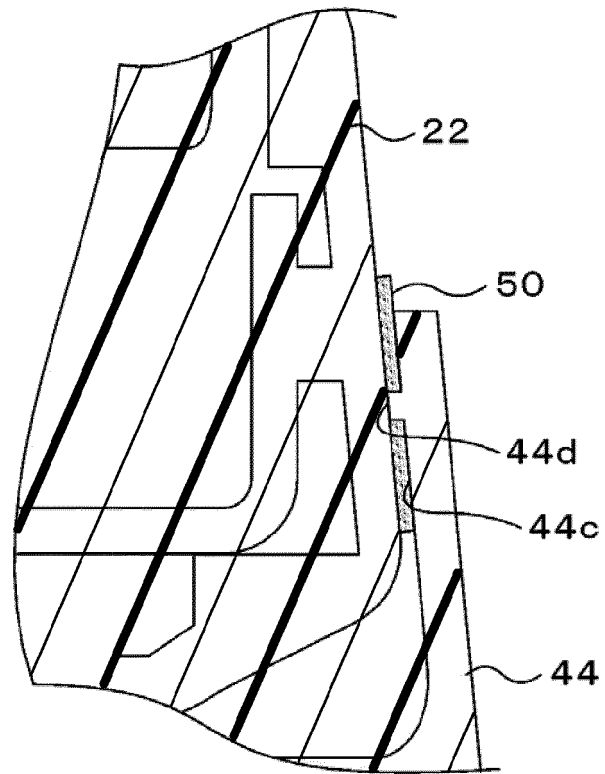
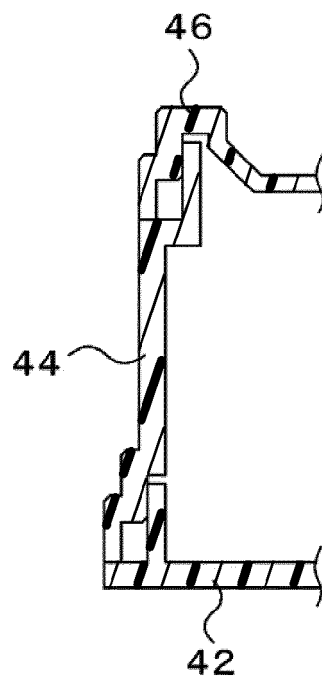


FIG. 10





EUROPEAN SEARCH REPORT

Application Number
EP 17 15 6816

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 18 July 2017	Examiner Pérez Méndez, José F
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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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