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(71) Applicant: **Mitsui Kinzoku ACT Corporation**
Yokohama-shi, Kanagawa 220-0011 (JP)

(72) Inventor: **Nagaoka, Tomoharu**
Yokohama-shi, Kanagawa, 220-0011 (JP)

(74) Representative: **Grünecker Patent- und Rechtsanwälte**
PartG mbB
Leopoldstraße 4
80802 München (DE)

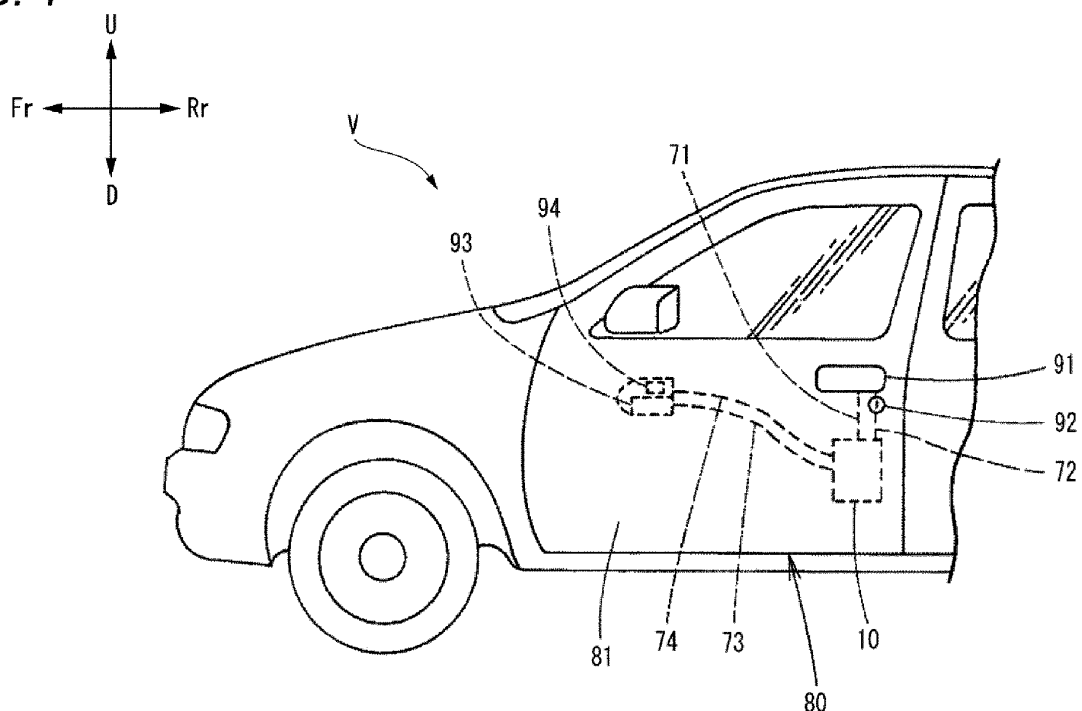
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(54) **VEHICLE DOOR LATCH DEVICE**

(57) A vehicle door latch device has a latch mechanism including a latch configured to engage with a striker provided on a vehicle body, and an operation mechanism configured to operate the latch mechanism. The operation mechanism includes an input lever configured to come in contact with an operation force transmission rod and to receive an operation force applied to an outside handle via the operation force transmission rod. The input

lever includes a receiving portion having a shape cut out in an operating direction of the operation force transmission rod and configured to receive a load from the operation force transmission rod. The input lever has a clip assembled to the input lever. The clip is engaged with the operation force transmission rod. A direction of assembling the clip to the input lever is identical to the operating direction of the operation force transmission rod.

FIG. 1



Description

TECHNICAL FIELD

[0001] The present invention relates to a vehicle door latch device capable of holding a vehicle door in a closed state.

BACKGROUND ART

[0002] In the related art, there has been a vehicle door latch device capable of holding a vehicle door in a closed state. Generally, a vehicle door is provided with an outside handle and an operation force transmission rod for transmitting an operation force applied to the outside handle. In addition, a vehicle door latch device generally includes a latch mechanism including a latch engageable with a striker provided on a vehicle body, and an operation mechanism for operating the latch mechanism. The operation mechanism includes an input lever which comes in contact with the operation force transmission rod to receive the operation force applied to the outside handle.

[0003] For example, JPS62-000385Y2 (Utility Model) discloses a vehicle door latch device in which an input lever is provided with a height-adjusting four-stage rod coupling bush. In the vehicle door latch device described in JPS62-000385Y2, the operation force transmission rod is in contact with any one of four-stage rod receiving surfaces provided to the rod coupling bush, which have different heights. Accordingly, in the vehicle door latch device described in JPS62-000385Y2, variations in the positions of the outside handle and the vehicle door latch device can be adjusted by the rod coupling bush. On the other hand, in the vehicle door latch device described in JPS62-000385Y2, the rod coupling bush requires a plurality of rod receiving surfaces to be in contact with the operation force transmission rod. Therefore, if it is necessary to secure a large operation stroke of the operation force transmission rod, the operation force transmission rod may slip off the predetermined rod receiving surface, which may cause stroke loss.

[0004] For example, FR003089242A1 discloses a vehicle door latch device, in which the input lever is provided with a clip having a substantially U-shaped cylindrical portion formed thereon for the purpose of preventing stroke loss.

[0005] However, in the vehicle door latch device described in FR003089242A1, the operation force transmission rod operates in the upper-lower direction, whereas the clip is assembled to the input lever in the horizontal direction. Therefore, in order to prevent the clip from being detached from the input lever due to the operation of the operation force transmission rod, it is necessary to firmly assemble the clip to the input lever, which leads to an increase in size of the device.

SUMMARY OF INVENTION

[0006] The present invention provides a vehicle door latch device capable of preventing a clip from being detached from an input lever due to an operation of an operation force transmission rod without increasing the size of the device, and capable of preventing the operation force transmission rod from being displaced with respect to the input lever due to the operation of the operation force transmission rod while allowing the operation of the operation force transmission rod.

(1) A vehicle door latch device having:

a latch mechanism including a latch configured to engage with a striker provided on a vehicle body; and
an operation mechanism configured to operate the latch mechanism,
in which the operation mechanism includes an input lever configured to come in contact with an operation force transmission rod and to receive an operation force applied to an outside handle via the operation force transmission rod, the input lever includes a receiving portion having a shape cut out in an operating direction of the operation force transmission rod and configured to receive a load from the operation force transmission rod,
the input lever has a clip assembled to the input lever, the clip being engaged with the operation force transmission rod, and
a direction of assembling the clip to the input lever is identical to the operating direction of the operation force transmission rod.

(2) The vehicle door latch device according to the above-described (1),

in which the input lever is formed with a vertical wall portion extending in the operating direction of the operation force transmission rod,
the clip includes a tubular holding portion configured to allow the vertical wall portion of the input lever to be inserted, and
the clip is assembled to the input lever by inserting the vertical wall portion of the input lever into the holding portion.

(3) The vehicle door latch device according to the above-described (2),

in which the input lever includes:

a first support portion configured to restrict a displacement of the operation force transmission rod in a first direction perpendicular to the operating direction of the operation

force transmission rod; and
 a second support portion configured to re-
 strict a displacement of the operation force
 transmission rod in a second direction per-
 pendicular to both the operating direction of
 the operation force transmission rod and the
 first direction,

the clip has an insertion hole formed in a region
 surrounded by the first support portion and the
 second support portion when viewed in the op-
 erating direction of the operation force transmis-
 sion rod, the insertion hole penetrating in the
 operating direction of the operation force trans-
 mission rod, and
 the operation force transmission rod is inserted
 through the insertion hole of the clip.

(4) The vehicle door latch device according to the
 above-described (3),

in which the clip includes a pedestal portion cov-
 ering at least a part of a surface of at least one
 of the first support portion and the second sup-
 port portion, the surface facing the operating di-
 rection of the operation force transmission rod,
 the pedestal portion is provided with a locking
 claw configured to lock at least one of the first
 support portion and the second support portion,
 and
 the clip is fixed to the input lever by the pedestal
 portion and the locking claw clamping at least
 one of the first support portion and the second
 support portion in the operating direction of the
 operation force transmission rod.

(5) The vehicle door latch device according to the
 above-described (4),

in which the operation force transmission rod
 engaged with the input lever includes:

a transmission portion extending in an up-
 per-lower direction;
 a crank portion bent rearward from a lower
 end of the transmission portion; and
 an insertion portion bent downward from a
 rear end of the crank portion,

the clip includes an accommodating portion sur-
 rounded by a bottom wall portion, a left inner
 wall portion extending upward from a left end of
 the bottom wall portion, and a right inner wall
 portion extending upward from a right end of the
 bottom wall portion,
 the accommodating portion of the clip is formed
 with a pair of left and right guide projections pro-
 truding from the left inner wall portion and the

right inner wall portion toward a center in a left-
 right direction of the accommodating portion,
 and
 at least a part of the crank portion of the opera-
 tion force transmission rod is accommodated to
 extend in a front-rear direction between the pair
 of left and right guide projections.

[0007] According to the present invention, it is possible
 to prevent a clip from coming off an input lever due to an
 operation of an operation force transmission rod without
 increasing the size of the device, and to prevent the op-
 eration force transmission rod from being displaced with
 respect to the input lever due to the operation of the op-
 eration force transmission rod while allowing the opera-
 tion of the operation force transmission rod.

BRIEF DESCRIPTION OF DRAWINGS

[0008]

FIG. 1 is a left side view of a left front portion of a
 vehicle including a vehicle door latch device accord-
 ing to an embodiment of the present invention.

FIG. 2 is a perspective view of a main part of the
 vehicle door latch device of FIG. 1 as viewed from
 the front.

FIG. 3 is a perspective view of the main part of the
 vehicle door latch device of FIG. 1 as viewed from
 the rear.

FIG. 4 is a perspective view of the main part of the
 latch mechanism and an outside handle operation
 force transmission mechanism of the vehicle door
 latch device illustrated in FIGs. 2 and 3 as viewed
 from the rear.

FIG. 5 is a front view of the latch mechanism and the
 outside handle operation force transmission mech-
 anism of the vehicle door latch device illustrated in
 FIGs. 2 and 3 as viewed from the front.

FIG. 6 is a perspective view of the vicinity of an input
 lever in the vehicle door latch device of FIGs. 2 and
 3 as viewed from the front.

FIG. 7 is a perspective view of the vicinity of the input
 lever of FIG. 6 as viewed from the front, with a cap
 removed.

FIG. 8 is a top view of the vicinity of the cap of the
 vehicle door latch device of FIGs. 2 and 3 as viewed
 from above.

FIG. 9 is a left side view of the vicinity of the cap of
 the vehicle door latch device in FIGs. 2 and 3 as
 viewed from the left.

DESCRIPTION OF EMBODIMENTS

[0009] Hereinafter, a vehicle door latch device accord-
 ing to an embodiment of the present invention will be
 described with reference to the accompanying drawings.
 The drawings are to be viewed in the directions of refer-

ence signs. In the present description and the like, in order to simplify and clarify the description, the front, rear, left, right, up, and down directions are described according to the directions viewed from the driver of the vehicle on which the vehicle door latch device is mounted. In the drawings, Fr denotes the front side of the vehicle, Rr denotes the rear side, L denotes the left side, R denotes the right side, U denotes the upper side, and D denotes the lower side.

[0010] As illustrated in FIG. 1, a door latch device 10 is mounted on a left front door 80 of a vehicle V. The left front door 80 includes an outer panel 81 and an inner panel (not illustrated). The outer surface of the rear upper portion of the outer panel 81 is provided with an outside handle 91 for opening the door latch device 10 from the outside of the vehicle and a key cylinder 92 for unlocking and locking the door latch device 10 from the outside of the vehicle. The inner surface of the front portion of the inner panel is provided with an inside handle 93 for opening the door latch device 10 from the vehicle interior and a lock knob 94 for unlocking and locking the door latch device 10 from the vehicle interior. Further, the left front door 80 is provided with an operation force transmission rod 71 for transmitting an operation force applied to the outside handle 91 to the door latch device 10, an operation force transmission member 72 for transmitting an operation force applied to the key cylinder 92 to the door latch device 10, a first operation force transmission cable 73 for transmitting an operation force applied to the inside handle 93 to the door latch device 10, and a second operation force transmission cable 74 for transmitting an operation force applied to the lock knob 94 to the door latch device 10.

[0011] Hereinafter, the left side may be referred to as the outer side in the vehicle width direction, and the right side may be referred to as the inner side in the vehicle width direction.

[0012] As illustrated in FIGs. 2 to 5, the door latch device 10 includes a latch mechanism 20 that can hold the left front door 80 in a closed state by engaging with a striker provided to the vehicle body, and an operation mechanism 30 for operating the latch mechanism 20. The door latch device 10 is a device obtained by integrating the latch mechanism 20 and the operation mechanism 30.

[0013] The door latch device 10 further includes a main body 41 fixed to the rear end of the left front door 80, a metal cover plate 42 covering at least a part of the rear surface of the main body 41, a side body 43 covering at least a part of the inner surface of the main body 41 in the vehicle width direction, extending forward from the main body 41, and extending in the front-rear direction and the upper-lower direction, a metal back plate 44 covering at least a part of the front surface of the main body 41, and a side cover (not illustrated) facing the side body 43 on the outer side of the side body 43 in the vehicle width direction. Accordingly, the main body 41 is sandwiched in the front-rear direction between the metal cover

plate 42 and back plate 44.

[0014] The cover plate 42 is formed with a striker entry groove 421 that allows a striker provided to the vehicle body to enter from the inner side of the striker entry groove 421 in the vehicle width direction. The striker entry groove 421 is provided at a substantially central portion in the upper-lower direction of the cover plate 42, and is formed in a hollowed shape that is recessed outward in the vehicle width direction from the inner end in the vehicle width direction of the cover plate 42.

[0015] The latch mechanism 20 includes a latch 21 engageable with the striker provided to the vehicle body, a latch shaft 22 rotatably supporting the latch 21, and a ratchet 23 engageable with the latch 21.

[0016] The latch shaft 22 extends in the front-rear direction, and has a front end supported by and fixed to the back plate 44 of the door latch device 10 and a rear end supported by and fixed to the cover plate 42 of the door latch device 10.

[0017] The latch 21 includes a latch body 211 formed with an insertion hole 212 that allows the latch shaft 22 to be inserted. The latch shaft 22 is inserted into the insertion hole 212, so that the latch 21 is rotatably supported by the latch shaft 22. Accordingly, the latch 21 rotates about the latch shaft 22 extending in the front-rear direction.

[0018] The latch 21 is biased by a coil spring 24 clockwise as viewed from the front.

[0019] The latch body 211 is formed with a striker engaging groove 213 that allows the striker provided to the vehicle body to be inserted. The striker engaging groove 213 has a concave shape recessed from the outer peripheral edge of the latch body 211 toward the insertion hole 212 when viewed in the front-rear direction. The striker engaging groove 213 partially overlaps at least the striker entry groove 421 formed in the cover plate 42 when viewed in the front-rear direction.

[0020] The outer peripheral edge of the latch body 211 is formed with a ratchet engaging portion 214 engageable with the ratchet 23. In the present embodiment, the ratchet engaging portion 214 is formed clockwise of the striker engaging groove 213 when viewed from the front.

[0021] The ratchet 23 includes a rotary shaft 231 extending in the front-rear direction, a contact portion 232 extending leftward from the rotary shaft 231 and being in contact with the ratchet engaging portion 214 formed on the latch body 211, and an input portion 233 extending rightward from the rotary shaft 231 and receiving an input from a release lever 31 of the operation mechanism 30 to be described later. In the present embodiment, the input portion 233 is formed to extend rightward from the rotary shaft 231 in front of the contact portion 232.

[0022] The ratchet 23 is arranged such that the rotary shaft 231 is located below and rightward of the latch shaft 22.

[0023] The rotary shaft 231 includes a front rotary shaft 231a and a rear rotary shaft 231b. The front rotary shaft 231a and the rear rotary shaft 231b have coaxial cylin-

dricial shapes. In the present embodiment, the rear rotary shaft 231b has a larger diameter than the front rotary shaft 231a. The front rotary shaft 231a is rotatably supported by the back plate 44, and the rear rotary shaft 231b is rotatably supported by the cover plate 42.

[0024] The ratchet 23 is rotatable about the axis of the rotary shaft 231 extending in the front-rear direction, clockwise and counterclockwise when viewed in the front-rear direction.

[0025] The ratchet 23 is biased counterclockwise when viewed from the front by a coil spring 25.

[0026] When the left front door 80 is closed and approaches the fully closed position, the striker provided to the vehicle body enters the striker entry groove 421 of the cover plate 42 and also enters the striker engaging groove 213 of the latch 21. When the left front door 80 further approaches the fully closed position, the striker provided to the vehicle body presses the inner wall surface of the striker engaging groove 213 outward in the vehicle width direction while approaching the bottom of the striker engaging groove 213 of the latch 21, thereby rotating the latch 21 against the biasing force of the coil spring 24 counterclockwise when viewed from the front.

[0027] When the left front door 80 reaches the fully closed position, the contact portion 232 of the ratchet 23, which is biased counterclockwise when viewed from the front, comes into contact with the ratchet engaging portion 214 of the latch 21, which rotates counterclockwise when viewed from the front. The ratchet 23, which is biased counterclockwise when viewed from the front, engages with the latch 21, which is biased counterclockwise when viewed from the front. Accordingly, the counterclockwise rotation of the latch 21 as viewed from the front is restricted, and the left front door 80 is held in the closed state.

[0028] The operation mechanism 30 further includes various operation levers, linking levers, and motors (not illustrated) assembled to the main body 41, the cover plate 42, the back plate 44, the side body 43, and the like.

[0029] The operation mechanism 30 includes a release lever 31 (see FIG. 4) for operating the ratchet 23 of the latch mechanism 20, an outside handle operation force transmission mechanism 50 for transmitting the operation force applied to the outside handle 91 input via the operation force transmission rod 71 to operate the release lever 31, a key cylinder operation force transmission mechanism 32 for transmitting the operation force applied to the key cylinder 92 input via the operation force transmission member 72 to restrict the operation of the release lever 31, an inside handle operation force transmission mechanism 33 for transmitting the operation force applied to the inside handle 93 input via the first operation force transmission cable 73 to operate the release lever 31, and a lock knob operation force transmission mechanism 34 for transmitting the operation force applied to the lock knob 94 input via the second operation force transmission cable 74 to restrict the operation of the release lever 31.

[0030] The release lever 31 is slidable in the upper-lower direction, and includes a ratchet driving portion 31a that can contact with the ratchet 23 from below. The release lever 31 is provided below the input portion 233 of the ratchet 23. When the release lever 31 slides upward, the ratchet driving portion 31a comes into contact with the input portion 233 of the ratchet 23 upward from below. The lower region of the release lever 31 is formed with an engaging hole 31b penetrating in the left-right direction and allowing an engaging portion 532a to be inserted. The engaging portion 532a is formed on an output lever 53 (described later) of the outside handle operation force transmission mechanism 50.

(Configuration of Outside Handle Operation Force Transmission Mechanism)

[0031] As illustrated in FIGs. 4 and 5, the outside handle operation force transmission mechanism 50 includes an input lever 51 that is in contact with the operation force transmission rod 71 and receives the operation force applied the outside handle 91 via the operation force transmission rod 71, a linking lever 52 that can be in contact with the input lever 51, and an output lever 53 that can be in contact with the linking lever 52 and is engaged with the release lever 31.

[0032] The input lever 51 is rotatably supported by the main body 41 such that the rotary shaft 510 extends in the front-rear direction. The input lever 51 is pivotally supported by the lower left region of the main body 41. The input lever 51 includes an input portion 511 extending in the upper left direction from the rotary shaft 510, and an output portion 512 extending in the upper right direction from the rotary shaft 510 when viewed in the front-rear direction.

[0033] The input portion 511 of the input lever 51 has a clip 60 assembled to the input lever 51. The clip 60 engages with the operation force transmission rod 71. The upper left end of the output portion 512 of the input lever 51 is formed with an output-side contact surface 512a. The output-side contact surface 512a faces the upper left direction.

[0034] The input lever 51 is biased by the coil spring 513 counterclockwise as viewed from the front.

[0035] The linking lever 52 is rotatably supported by the main body 41 such that the rotary shaft 520 extends in the front-rear direction. The linking lever 52 is pivotally supported by the main body 41 above the input lever 51 such that the rotary shaft 520 is located above the rotary shaft 510 of the input lever 51. The linking lever 52 includes an input portion 521 extending downward from the rotary shaft 520, and an output portion 522 extending rightward from the rotary shaft 520.

[0036] The right side of the lower end of the input portion 521 of the linking lever 52 is formed with an input-side contact surface 521a to face the output-side contact surface 512a formed on the output portion 512 of the input lever 51, on the left side of the output-side contact

surface 512a. The input-side contact surface 521a faces the lower right direction. The lower side of the right end of the output portion 522 of the linking lever 52 is formed with an output-side contact surface 522a. The output-side contact surface 522a faces the lower left direction.

[0037] The output lever 53 is rotatably supported by the main body 41 such that the rotary shaft 530 extends in the front-rear direction. The output lever 53 is pivotally supported by the main body 41 on the right side of the input portion 521 of the linking lever 52 such that the rotary shaft 530 is located on the upper right side of the rotary shaft 510 of the input lever 51 and on the lower right side of the rotary shaft 520 of the linking lever 52. The output lever 53 includes an input portion 531 extending leftward from the rotary shaft 530 and an output portion 532 extending rightward from the rotary shaft 530.

[0038] The upper side of the right end of the input portion 531 of the output lever 53 is formed with an input-side contact surface 531a to face the output-side contact surface 522a formed on the output portion 522 of the linking lever 52, on the lower side of the output-side contact surface 522a. The input-side contact surface 531a faces the upper left direction. The right end of the output portion 532 of the output lever 53 is formed with an engaging portion 532a protruding rightward. The engaging portion 532a is inserted into the engaging hole 31b formed in the release lever 31, whereby the output lever 53 is engaged with the release lever 31.

[0039] The output lever 53 is biased by the coil spring 533 counterclockwise when viewed from the front.

(Operation of Outside Handle Operation Force Transmission Mechanism)

[0040] The operation force transmission rod 71 is displaced downward when the outside handle 91 is operated. In this way, the operation force transmission rod 71 is engaged with the input portion 511 of the input lever 51, and thus the input lever 51 rotates about the rotary shaft 510 clockwise when viewed from the front.

[0041] When the input lever 51 rotates about the rotary shaft 510 clockwise as viewed from the front, the output-side contact surface 512a of the output portion 512 comes into contact with the input-side contact surface 521a of the input portion 521 of the linking lever 52, thereby rotating the linking lever 52 about the rotary shaft 520 counterclockwise as viewed from the front.

[0042] When the linking lever 52 rotates about the rotary shaft 520 counterclockwise as viewed from the front, the output-side contact surface 522a of the output portion 522 comes into contact with the input-side contact surface 531a of the input portion 531 of the output lever 53, thereby rotating the output lever 53 about the rotary shaft 530 clockwise as viewed from the front.

[0043] When the output lever 53 rotates about the rotary shaft 530 clockwise as viewed from the front, the engaging portion 532a of the output portion 532 comes into in contact with the wall surface of the engaging hole

31b formed in the release lever 31, thereby displacing the release lever 31 upward.

[0044] When the release lever 31 is displaced upward, the ratchet driving portion 31a comes into contact with the input portion 233 of the ratchet 23, thereby rotating the ratchet 23 about the rotary shaft 231 clockwise when viewed from the front.

[0045] When the ratchet 23 rotates about the rotary shaft 231 clockwise as viewed from the front, the contact portion 232 of the ratchet 23 is separated from the ratchet engaging portion 214 of the latch 21. Accordingly, the restriction of the counterclockwise rotation of the latch 21 as viewed from the front is released. The latch 21, which is biased counterclockwise as viewed from the front, rotates counterclockwise as viewed from the front. The striker provided to the vehicle body becomes capable of separating from the striker engaging groove 213 of the latch 21 and the striker entry groove 421 of the cover plate 42. Thus, the left front door 80 can be opened.

(Configuration of Input Portion of Input Lever)

[0046] Next, the input portion 511 of the input lever 51 of the outside handle operation force transmission mechanism 50 will be described in detail with reference to FIGs. 6 to 9.

[0047] The input portion 511 of the input lever 51 has a clip 60 assembled to the input lever 51. The clip 60 engages with the operation force transmission rod 71.

[0048] The input portion 511 is formed with a vertical wall portion 511a protruding upward.

[0049] The left end of the input portion 511 is formed with: an engaging wall portion 511b curved upward; a first support portion 511c1 bent rearward from the upper end of the engaging wall portion 511b and extending in the front-rear direction and the left-right direction; and a second support portion 511c2 bent rightward from the rear end of the first support portion 511c1 and extending in the left-right direction and the front-rear direction. The upper surface of the first support portion 511c1 and the upper surface of the second support portion 511c2 form the same continuous plane.

[0050] A receiving portion 511d is formed between the vertical wall portion 511a and the engaging wall portion 511b. The receiving portion 511d has a shape cut out in a substantially U-shape that opens upward when viewed from the front-rear direction. The vertical wall portion 511a extends higher than the first support portion 511c1 and the second support portion 511c2. The upper end of the vertical wall portion 511a is formed with a locking portion 511e for locking the clip 60. The locking portion 511e has a claw shape protruding rightward.

[0051] The second support portion 511c2 extends in the left-right direction at a position behind the receiving portion 511d and facing the receiving portion 511d in the front-rear direction.

[0052] The clip 60 covers the upper surface of the first support portion 511c1 and the upper surface of the sec-

ond support portion 511c2 of the input portion 511 of the input lever 51 and the receiving portion 511d of the input portion 511 of the input lever 51.

[0053] The clip 60 includes a tubular holding portion 61 extending in the upper-lower direction and allowing the vertical wall portion 511a of the input portion 511 of the input lever 51 to be inserted, a pedestal portion 62 covering the upper surfaces of the first support portion 511c1 and the second support portion 511c2 of the input portion 511 of the input lever 51, and an accommodating portion 63 covering the receiving portion 511d formed in the input portion 511 of the input lever 51.

[0054] The pedestal portion 62 covers the upper surfaces of the first support portion 511c1 and the second support portion 511c2 and is connected to the holding portion 61. Accordingly, the pedestal portion 62 has a substantially U-shape that is open forward when viewed from above.

[0055] The accommodating portion 63 has a shape recessed downward from the pedestal portion 62 along the receiving portion 511d formed in the input portion 511 of the input lever 51 when viewed in the front-rear direction. The accommodating portion 63 is a space surrounded by the pedestal portion 62 in the rear, left, and right directions when viewed in the upper-lower direction. The accommodating portion 63 is a space surrounded by the bottom wall portion 631, a left inner wall portion 632L extending upward from the left end of the bottom wall portion 631, a right inner wall portion 632R extending upward from the right end of the bottom wall portion 631, and a rear inner wall portion 632B extending upward from the rear end of the bottom wall portion 631. The bottom wall portion 631 of the accommodating portion 63 is curved in a substantially arc shape protruding downward.

[0056] The bottom wall portion 631 of the accommodating portion 63 is provided with a rod insertion hole 64 penetrating in the upper-lower direction. The operation force transmission rod 71 is inserted through the rod insertion hole 64. The rod insertion hole 64 is provided in the rear region of the bottom wall portion 631.

[0057] The rear end of the pedestal portion 62 of the clip 60 is provided with a locking claw 65 to be locked to the second support portion 511c2 of the input portion 511 of the input lever 51.

[0058] The clip 60 is assembled to the input portion 511 of the input lever 51 from above.

[0059] The clip 60 is assembled to the input portion 511 of the input lever 51 from above such that the vertical wall portion 511a of the input portion 511 of the input lever 51 is inserted into the tubular holding portion 61, the pedestal portion 62 is placed on the upper surface of the first support portion 511c1 and the upper surface of the second support portion 511c2 of the input portion 511 of the input lever 51, and the accommodating portion 63 is arranged in the receiving portion 511d of the input portion 511 of the input lever 51. Then, the locking portion 511e provided at the upper end of the vertical wall portion 511a of the input portion 511 of the input lever 51 is

locked to the upper surface of the holding portion 61 of the clip 60 from above. Further, the locking claw 65 provided at the rear end of the holding portion 61 of the clip 60 is locked to the lower surface of the second support portion 511c2 of the input portion 511 of the input lever 51 from below. Accordingly, the clip 60 is fixed to the input lever 51 by the pedestal portion 62 and the locking claw 65 sandwiching the second support portion 511c2 in the upper-lower direction.

[0060] The operation force transmission rod 71 includes a transmission portion 711 extending in the upper-lower direction, a crank portion 712 bent rearward from the lower end of the transmission portion 711, and an insertion portion 713 bent downward from the rear end of the crank portion 712.

[0061] The operation force transmission rod 71 is arranged such that the insertion portion 713 is inserted through the rod insertion hole 64 provided in the bottom wall portion 631 of the clip 60, and at least a part of the crank portion 712 is accommodated in the accommodating portion 63 of the clip 60.

[0062] When the outside handle 91 is operated and the operation force transmission rod 71 is moved downward, the crank portion 712 of the operation force transmission rod 71 presses downward the bottom wall portion 631 of the accommodating portion 63 formed in the clip 60 attached to the input portion 511 of the input lever 51 and the receiving portion 511d of the input lever 51. Accordingly, the input lever 51 rotates clockwise when viewed from the front. Thus, the load from the operation force transmission rod 71 is input to the bottom wall portion 631 of the accommodating portion 63 formed in the clip 60 attached to the input portion 511 of the input lever 51 and the receiving portion 511d of the input lever 51.

[0063] At this time, since the direction of assembling the clip 60 to the input lever 51 is identical to the operating direction of the operation force transmission rod 71, it is possible to prevent the clip 60 from being detached from the input lever 51 due to the operation of the operation force transmission rod 71, without increasing the size of the device. Further, at least a part of the crank portion 712, which is a portion of the operation force transmission rod 71 for operating the input lever 51, is accommodated in the accommodating portion 63 of the clip 60, and the load from the operation force transmission rod 71 can be received by the receiving portion 511d of the input lever 51. Therefore, the operation force transmission rod 71 can be prevented from being displaced with respect to the input lever 51 due to the operation of the operation force transmission rod 71, while allowing the movement of the operation force transmission rod 71.

[0064] The clip 60 is assembled to the input lever 51 by inserting the vertical wall portion 511a of the input lever 51, which extends in the upper-lower direction, that is, in the operating direction of the operation force transmission rod 71, into the holding portion 61. Therefore, even when the operation force transmission rod 71 is displaced in a direction perpendicular to the operating

direction, the clip 60 can be prevented from being displaced in a direction perpendicular to the operating direction of the operation force transmission rod 71 with respect to the input lever 51.

[0065] The input lever 51 further includes the first support portion 511c1 for restricting a displacement of the operation force transmission rod 71 in the left-right direction, which is the first direction perpendicular to the operating direction of the operation force transmission rod 71, and the second support portion 511c2 for restricting a displacement of the operation force transmission rod 71 in the front-rear direction, which is the second direction perpendicular to both the operating direction of the operation force transmission rod 71 and the left-right direction, which is the first direction. The operation force transmission rod 71 is inserted through the rod insertion hole 64 of the clip 60 formed in the region surrounded by the first support portion 511c1 and the second support portion 511c2 when viewed in the upper-lower direction, which is the operating direction of the operation force transmission rod 71. Therefore, the displacement of the operation force transmission rod 71 in the left-right direction and the front-rear direction is restricted. Accordingly, it is possible to prevent the operation force transmission rod 71 from being displaced in a direction perpendicular to the operating direction of the operation force transmission rod 71 and to prevent the operation force transmission rod 71 from being detached from the input lever 51.

[0066] The locking claw 65 provided at the rear end of the pedestal portion 62 of the clip 60 is locked to the lower surface of the second support portion 511c2 of the input portion 511 of the input lever 51 from below, so that the clip 60 is fixed to the input lever 51 by the pedestal portion 62 and the locking claw 65 sandwiching the second support portion 511c2 in the upper-lower direction. Accordingly, even when the operation force transmission rod 71 is operated, the clip 60 can be prevented from being displaced in the upper-lower direction, which is the operating direction of the operation force transmission rod 71, with respect to the input lever 51. Further, it is possible to easily confirm that the clip 60 is correctly assembled to the input lever 51 by visually checking whether the locking claw 65 of the clip 60 is locked to the second support portion 511c2 of the input portion 511 of the input lever 51.

[0067] The accommodating portion 63 of the clip 60 is formed with a pair of left and right guide projections 633 projecting from the left inner wall portion 632L and the right inner wall portion 632R toward the center in the left-right direction of the accommodating portion 63.

[0068] At least a part of the crank portion 712 of the operation force transmission rod 71 is accommodated in the accommodating portion 63 of the clip 60 to extend in the front-rear direction between the pair of left and right guide projections 633.

[0069] Accordingly, when the operation force transmission rod 71 and the input lever 51 are to be engaged with each other, the operation force transmission rod 71 is

assembled such that at least a part of the crank portion 712 extends in the front-rear direction between the pair of left and right guide projections 633, so that the operation force transmission rod 71 can be easily engaged with the input lever 51, which improves the assembling workability. Further, when the operation force transmission rod 71 is operated after the door latch device 10 is assembled to the vehicle V by engaging the operation force transmission rod 71 and the input lever 51, the operation force transmission rod 71 can be prevented from rattling in the left-right direction with respect to the input lever 51 by the pair of left and right guide projections 633.

[0070] Although an embodiment of the present invention has been described above with reference to the accompanying drawings, it is needless to say that the present invention is not limited to the embodiment. It is apparent to those skilled in the art that various modifications or corrections can be conceived within the scope described in the claims, and it is understood that the modifications or corrections naturally fall within the technical scope of the present invention. In addition, the constituent elements in the above embodiment may be freely combined without departing from the gist of the invention.

[0071] For example, in the present embodiment, the locking claw 65 is provided at the rear end of the pedestal portion 62 of the clip 60, and the locking claw 65 is locked to the lower surface of the second support portion 511c2 of the input portion 511 of the input lever 51 from below. However, the locking claw 65 may be provided at the left end of the pedestal portion 62 of the clip 60 and locked to the lower surface of the first support portion 511c1 of the input portion 511 of the input lever 51 from below.

[0072] In this specification, at least the following matters are described. The parentheses indicate the corresponding components and the like in the above-described embodiment as examples, but are not limited thereto.

(1) A vehicle door latch device (door latch device 10) including:

a latch mechanism (latch mechanism 20) including a latch (latch 21) configured to engage with a striker provided on a vehicle body; and
an operation mechanism (operation mechanism 30) configured to operate the latch mechanism, in which the operation mechanism includes an input lever (input lever 51) configured to come in contact with an operation force transmission rod (operation force transmission rod 71) and to receive an operation force applied to an outside handle (outside handle 91) via the operation force transmission rod,
the input lever includes a receiving portion (receiving portion 511d) having a shape cut out in an operating direction of the operation force transmission rod and configured to receive a load from the operation force transmission rod,

the input lever has a clip (clip 60) assembled to the input lever, the clip being engaged with the operation force transmission rod, and a direction of assembling the clip to the input lever is identical to the operating direction of the operation force transmission rod.

According to (1), since the direction of assembling the clip to the input lever is the same direction as the operating direction of the operation force transmission rod, it is possible to prevent the clip from being detached from the input lever due to the operation of the operation force transmission rod, without increasing the size of the device. Further, the load from the operation force transmission rod can be received by the receiving portion of the input lever, which has a shape cut out in the operating direction of the operation force transmission rod. Therefore, the operation force transmission rod can be prevented from being displaced with respect to the input lever due to the operation of the operation force transmission rod, while allowing the movement of the operation force transmission rod.

(2) The vehicle door latch device according to (1),

in which the input lever is formed with a vertical wall portion (vertical wall portion 511a) extending in the operating direction of the operation force transmission rod, the clip includes a tubular holding portion (holding portion 61) configured to allow the vertical wall portion of the input lever to be inserted, and the clip is assembled to the input lever by inserting the vertical wall portion of the input lever into the holding portion.

According to (2), the clip is assembled to the input lever by inserting the vertical wall portion of the input lever, which extends in the operating direction of the operation force transmission rod, into the holding portion. Therefore, even when the operation force transmission rod is displaced in a direction perpendicular to the operating direction, the clip can be prevented from being displaced in a direction perpendicular to the operating direction of the operation force transmission rod with respect to the input lever.

(3) The vehicle door latch device according to (2),

in which the input lever includes:

a first support portion (first support portion 511c1) configured to restrict a displacement of the operation force transmission rod in a first direction perpendicular to the operating direction of the operation force transmission rod; and

a second support portion (second support portion 511c2) configured to restrict a dis-

placement of the operation force transmission rod in a second direction perpendicular to both the operating direction of the operation force transmission rod and the first direction,

the clip has a rod insertion hole (rod insertion hole 64) formed in a region surrounded by the first support portion and the second support portion when viewed in the operating direction of the operation force transmission rod, the insertion hole penetrating in the operating direction of the operation force transmission rod, and the operation force transmission rod is inserted through the rod insertion hole of the clip.

According to (3), the operation force transmission rod is inserted into the rod insertion hole of the clip formed in the region surrounded by the first support portion and the second support portion when viewed from the operating direction of the operation force transmission rod. Therefore, it is possible to prevent the operation force transmission rod from being displaced in a direction perpendicular to the operating direction of the operation force transmission rod and to prevent the operation force transmission rod from being detached from the input lever.

(4) The vehicle door latch device according to (3),

in which the clip includes a pedestal portion (pedestal portion 62) covering at least a part of a surface of at least one of the first support portion and the second support portion, the surface facing the operating direction of the operation force transmission rod, the pedestal portion is provided with a locking claw (locking claw 65) configured to lock at least one of the first support portion and the second support portion, and the clip is fixed to the input lever by the pedestal portion and the locking claw clamping at least one of the first support portion and the second support portion in the operating direction of the operation force transmission rod.

According to (4), the clip is fixed to the input lever by the pedestal portion and the locking claw sandwiching at least one of the first support portion and the second support portion in the operating direction of the operation force transmission rod. Therefore, even when the operation force transmission rod is operated, the clip can be prevented from being displaced in the operating direction of the operation force transmission rod with respect to the input lever. Further, it is possible to easily confirm that the clip is correctly assembled to the input lever by visually checking whether the locking claw of the clip is locked to at least one of the first support portion and

the second support portion.

(5) The vehicle door latch device according to (4),

in which the operation force transmission rod engaged with the input lever includes:

a transmission portion (transmission portion 711) extending in an upper-lower direction;

a crank portion (crank portion 712) bent rearward from a lower end of the transmission portion; and

an insertion portion (insertion portion 713) bent downward from a rear end of the crank portion,

the clip includes an accommodating portion (accommodating portion 63) surrounded by a bottom wall portion (bottom wall portion 631), a left inner wall portion (left inner wall portion 632L) extending upward from a left end of the bottom wall portion, and a right inner wall portion (right inner wall portion 632R) extending upward from a right end of the bottom wall portion, the accommodating portion of the clip is formed with a pair of left and right guide projections (guide projections 633) protruding from the left inner wall portion and the right inner wall portion toward a center in a left-right direction of the accommodating portion, and at least a part of the crank portion of the operation force transmission rod is accommodated to extend in a front-rear direction between the pair of left and right guide projections.

According to (5), when the operation force transmission rod and the input lever are to be engaged with each other, the operation force transmission rod is assembled such that at least a part of the crank portion extends in the front-rear direction between the pair of left and right guide projections, so that the operation force transmission rod can be easily engaged with the input lever, which improves the assembling workability. Further, when the operation force transmission rod is operated after the door latch device is assembled to the vehicle by engaging the operation force transmission rod and the input lever, the operation force transmission rod can be prevented from rattling in the left-right direction with respect to the input lever by the pair of left and right guide projections.

Claims

1. A vehicle door latch device comprising:

a latch mechanism including a latch configured

to engage with a striker provided on a vehicle body; and

an operation mechanism configured to operate the latch mechanism,

wherein the operation mechanism includes an input lever configured to come in contact with an operation force transmission rod and to receive an operation force applied to an outside handle via the operation force transmission rod, the input lever includes a receiving portion having a shape cut out in an operating direction of the operation force transmission rod and configured to receive a load from the operation force transmission rod,

the input lever has a clip assembled to the input lever, the clip being engaged with the operation force transmission rod, and

a direction of assembling the clip to the input lever is identical to the operating direction of the operation force transmission rod.

2. The vehicle door latch device according to claim 1,

wherein the input lever is formed with a vertical wall portion extending in the operating direction of the operation force transmission rod, the clip includes a tubular holding portion configured to allow the vertical wall portion of the input lever to be inserted, and the clip is assembled to the input lever by inserting the vertical wall portion of the input lever into the holding portion.

3. The vehicle door latch device according to claim 2,

wherein the input lever includes:

a first support portion configured to restrict a displacement of the operation force transmission rod in a first direction perpendicular to the operating direction of the operation force transmission rod; and

a second support portion configured to restrict a displacement of the operation force transmission rod in a second direction perpendicular to both the operating direction of the operation force transmission rod and the first direction,

the clip has an insertion hole formed in a region surrounded by the first support portion and the second support portion when viewed in the operating direction of the operation force transmission rod, the insertion hole penetrating in the operating direction of the operation force transmission rod, and the operation force transmission rod is inserted through the insertion hole of the clip.

4. The vehicle door latch device according to claim 3,

wherein the clip includes a pedestal portion covering at least a part of a surface of at least one of the first support portion and the second support portion, the surface facing the operating direction of the operation force transmission rod, the pedestal portion is provided with a locking claw configured to lock at least one of the first support portion and the second support portion, and the clip is fixed to the input lever by the pedestal portion and the locking claw clamping at least one of the first support portion and the second support portion in the operating direction of the operation force transmission rod.

5. The vehicle door latch device according to claim 4,

wherein the operation force transmission rod engaged with the input lever includes:

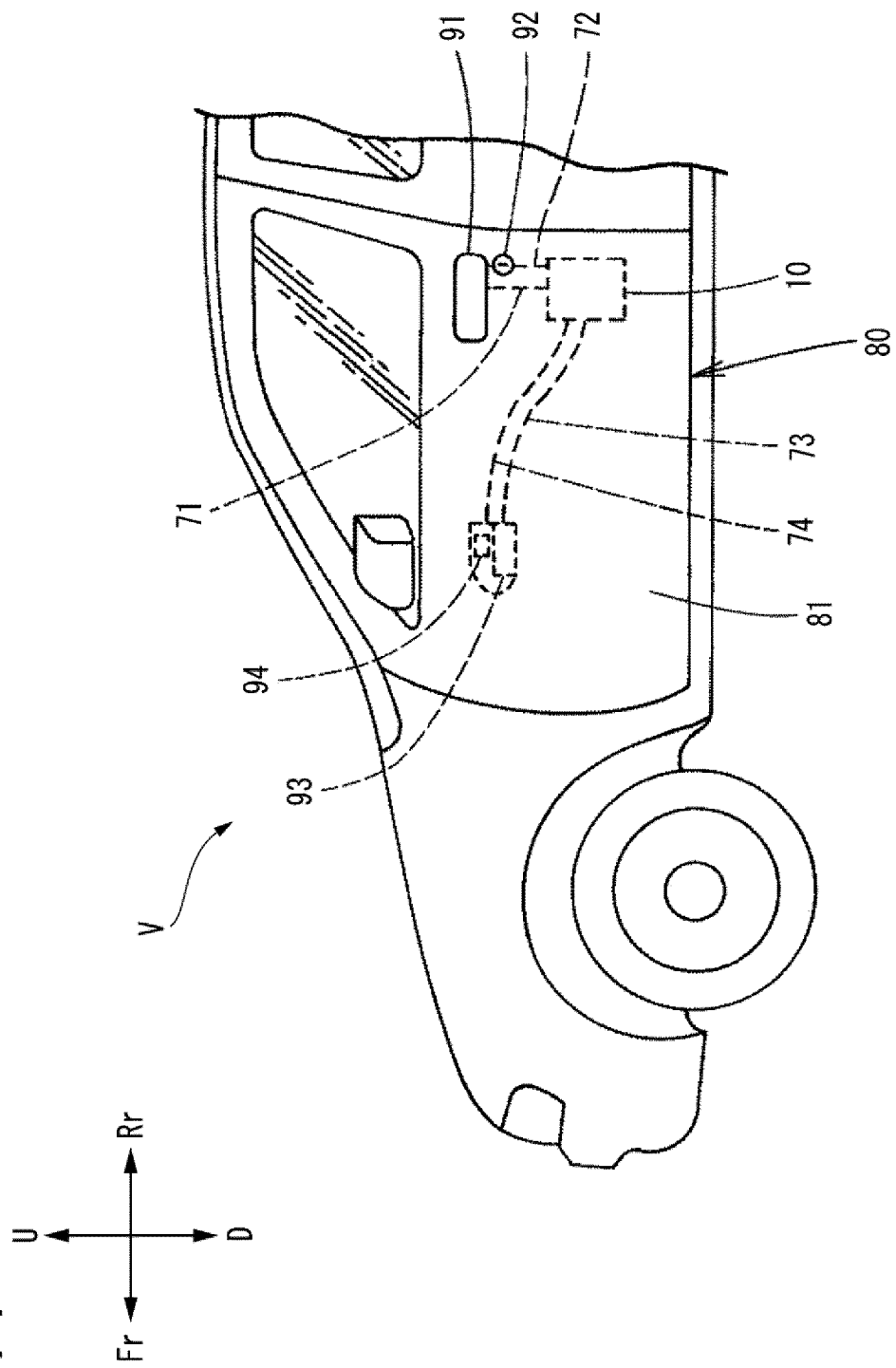
a transmission portion extending in an upper-lower direction;
a crank portion bent rearward from a lower end of the transmission portion; and
an insertion portion bent downward from a rear end of the crank portion,

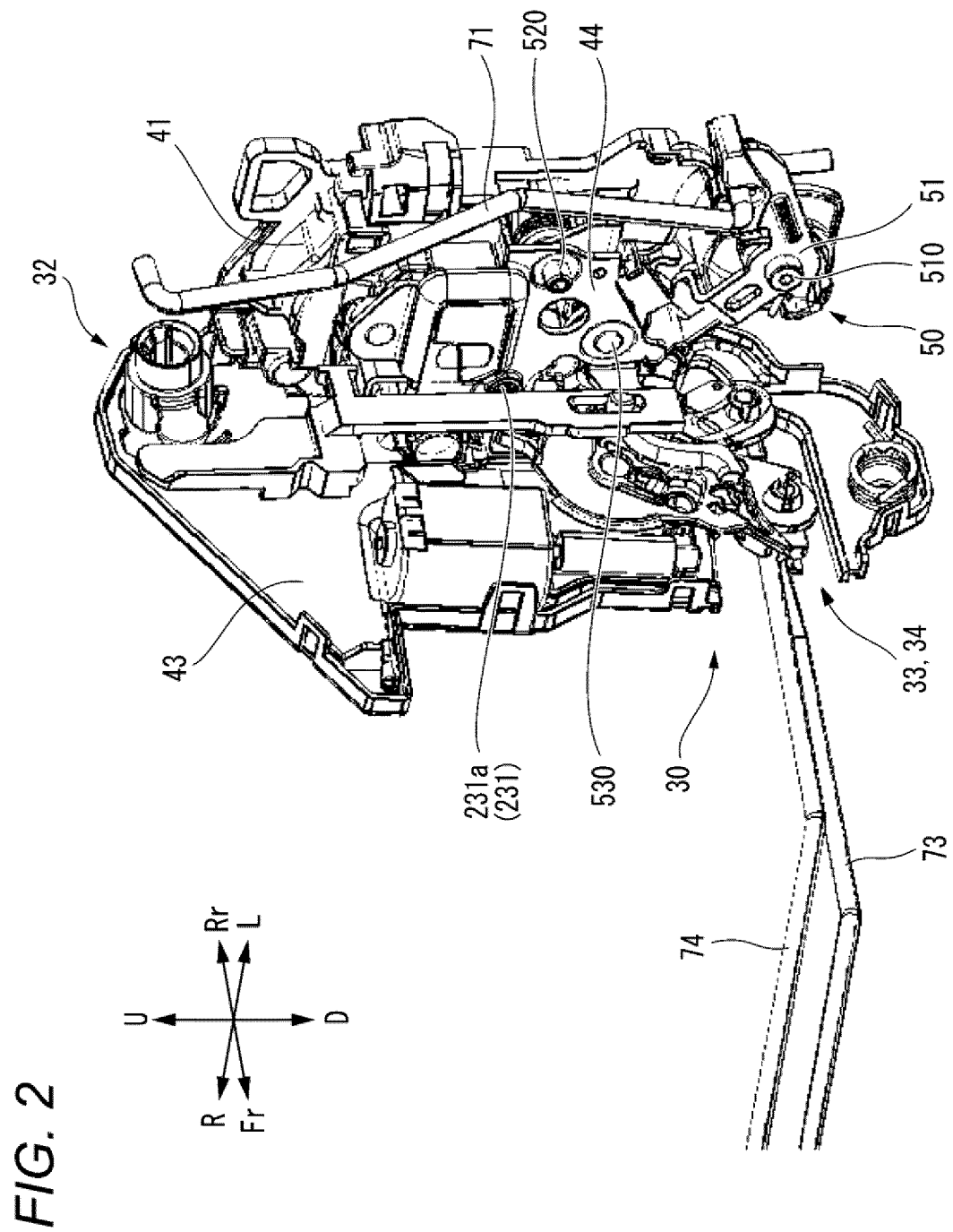
the clip includes an accommodating portion surrounded by a bottom wall portion, a left inner wall portion extending upward from a left end of the bottom wall portion, and a right inner wall portion extending upward from a right end of the bottom wall portion, the accommodating portion of the clip is formed with a pair of left and right guide projections protruding from the left inner wall portion and the right inner wall portion toward a center in a left-right direction of the accommodating portion, and at least a part of the crank portion of the operation force transmission rod is accommodated to extend in a front-rear direction between the pair of left and right guide projections.

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FIG. 1





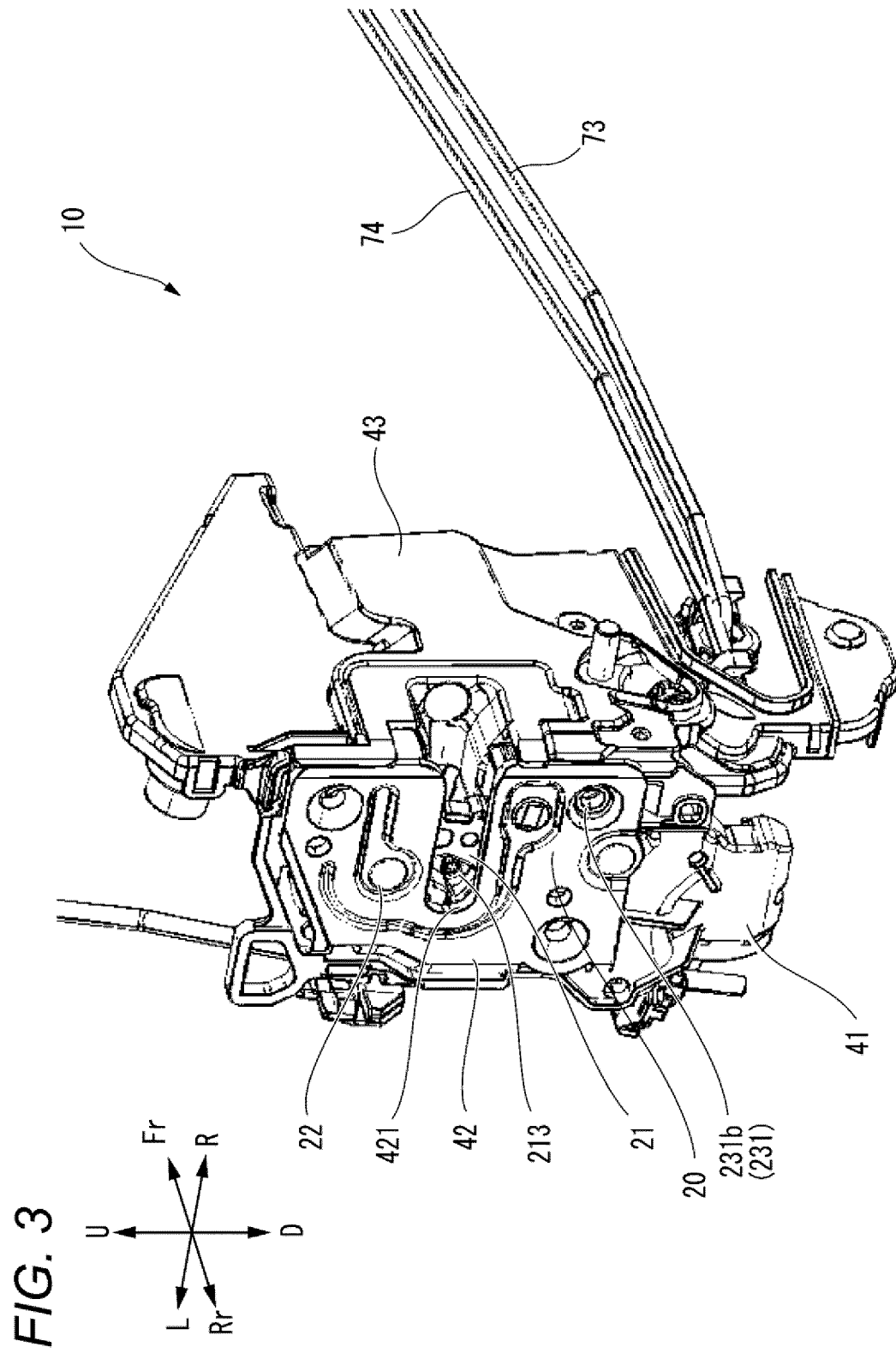


FIG. 4

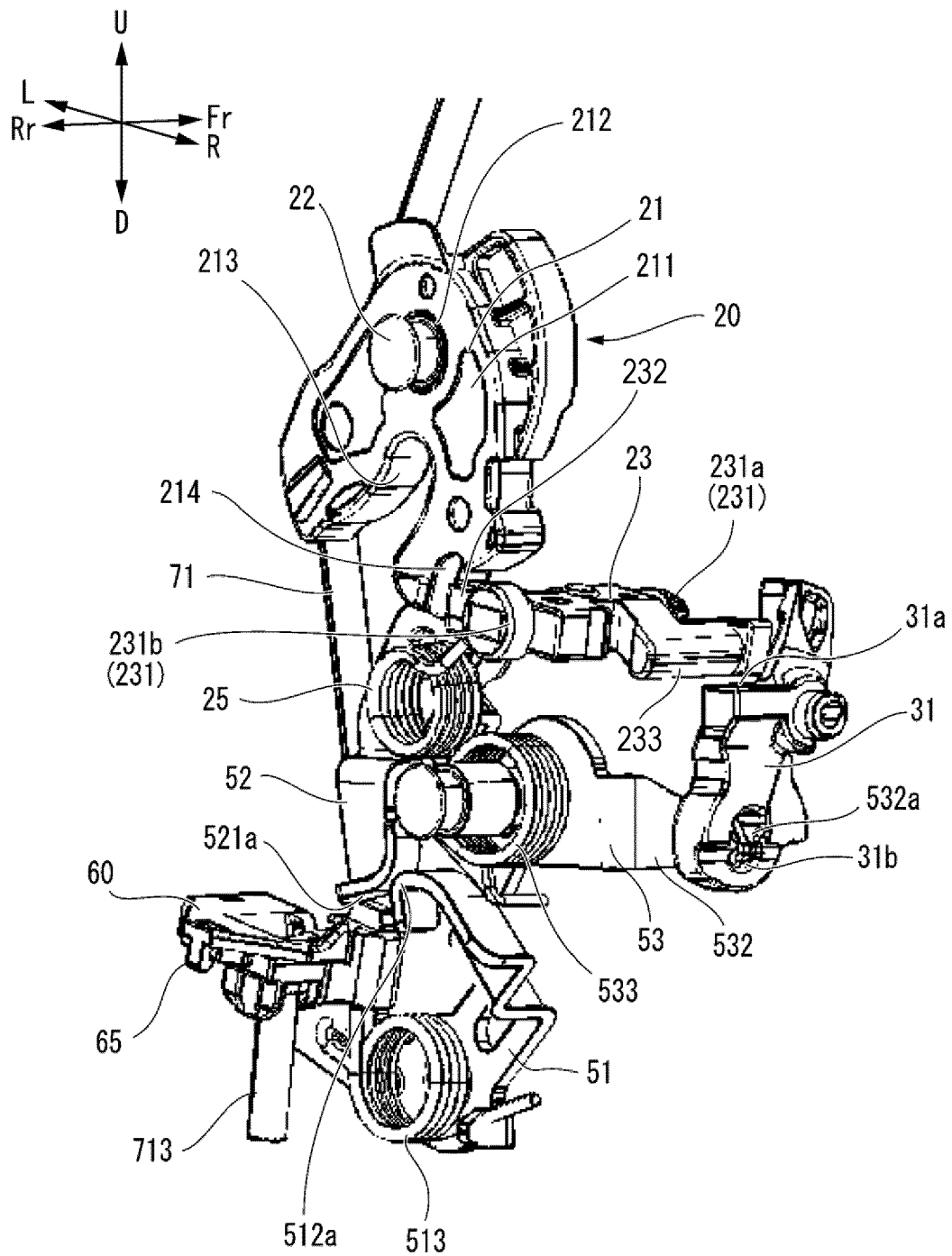
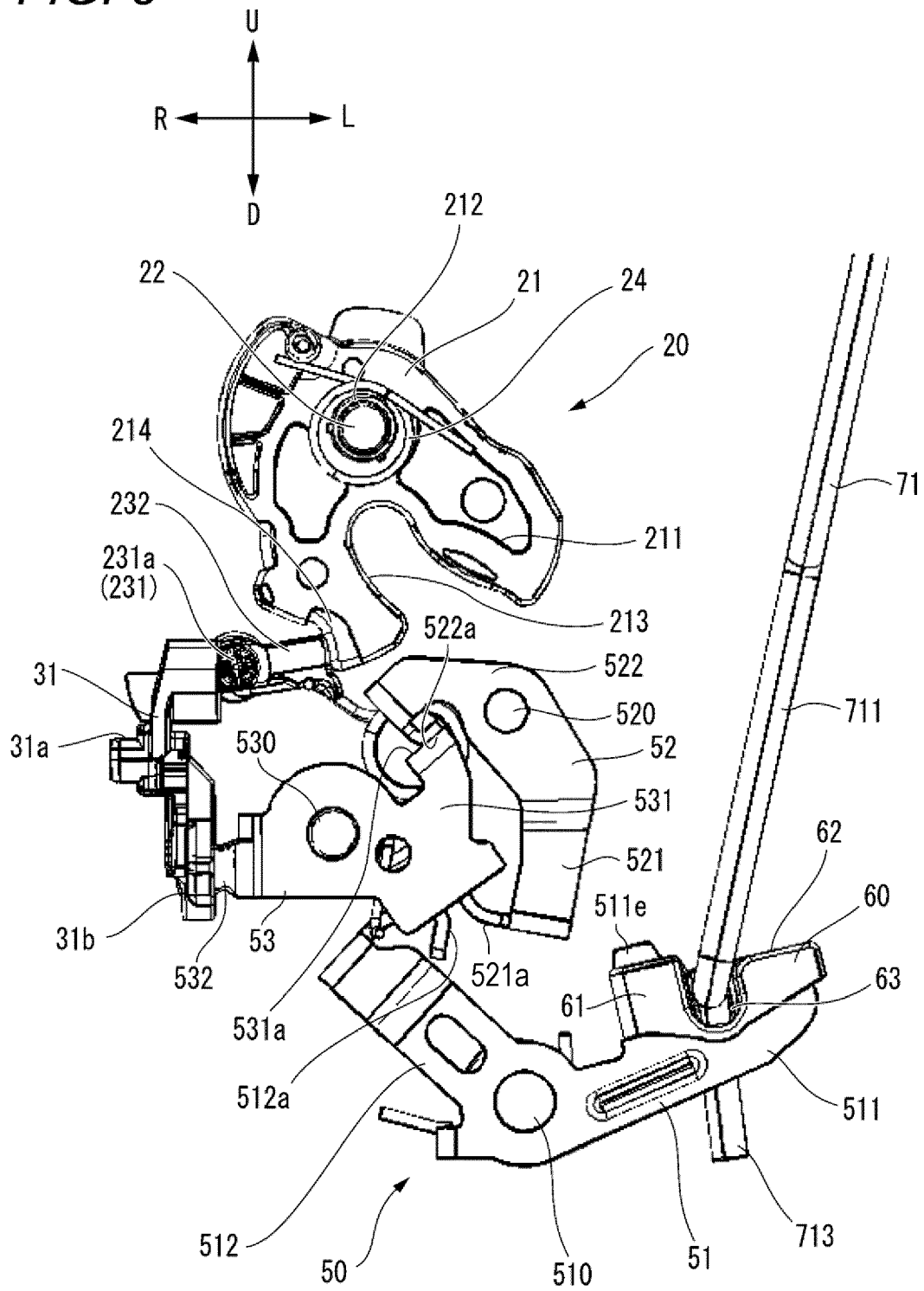
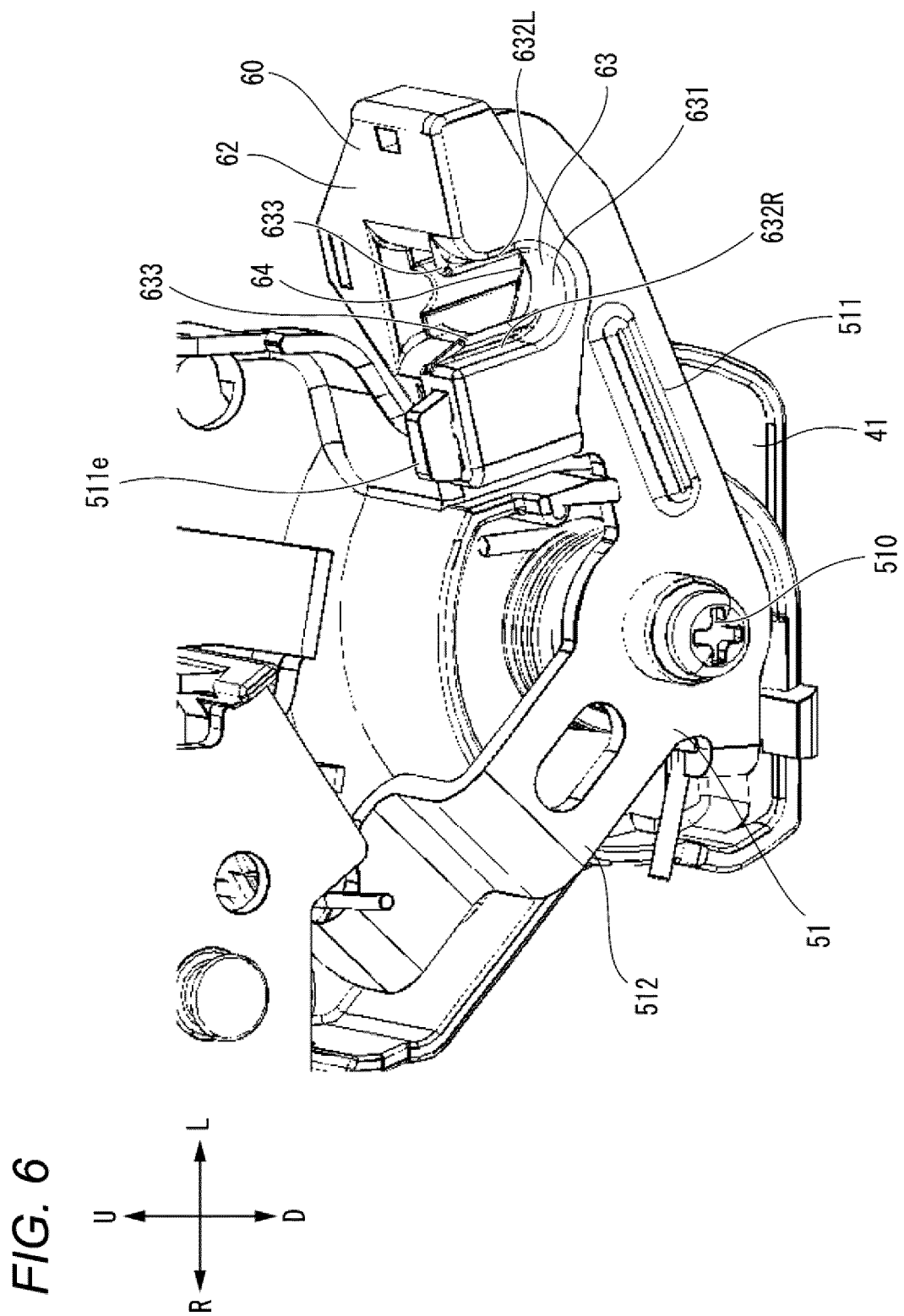


FIG. 5





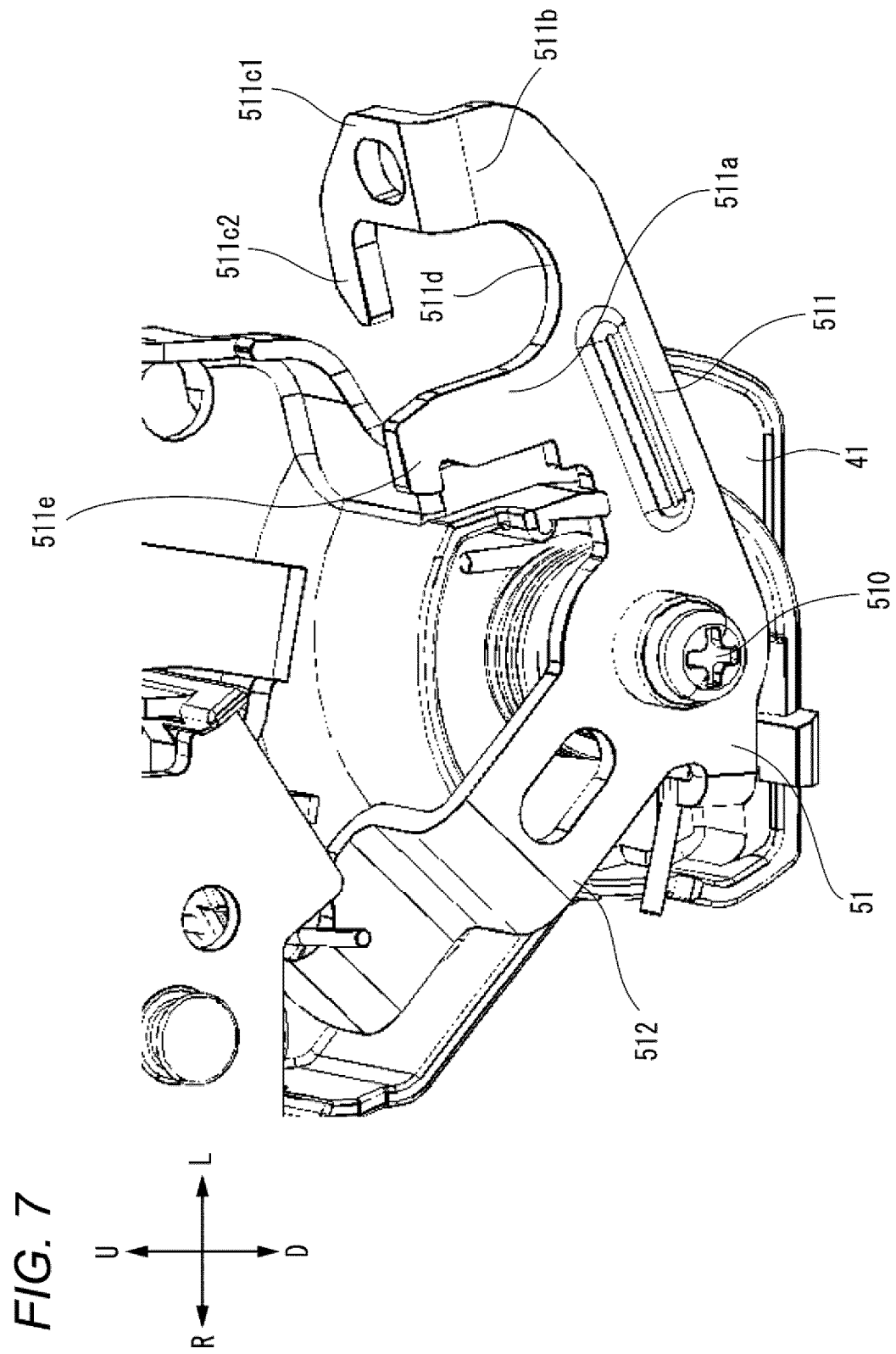


FIG. 8

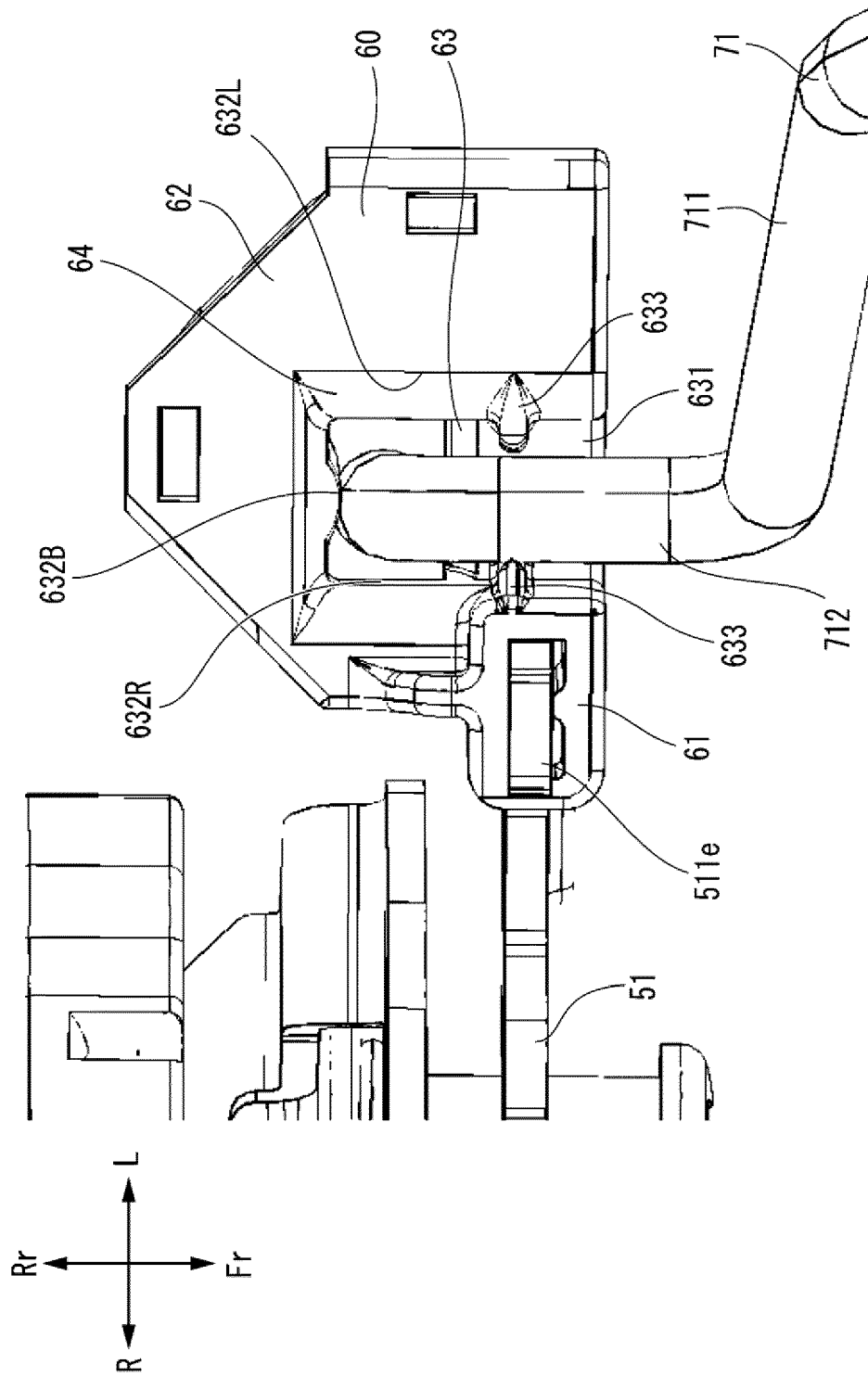
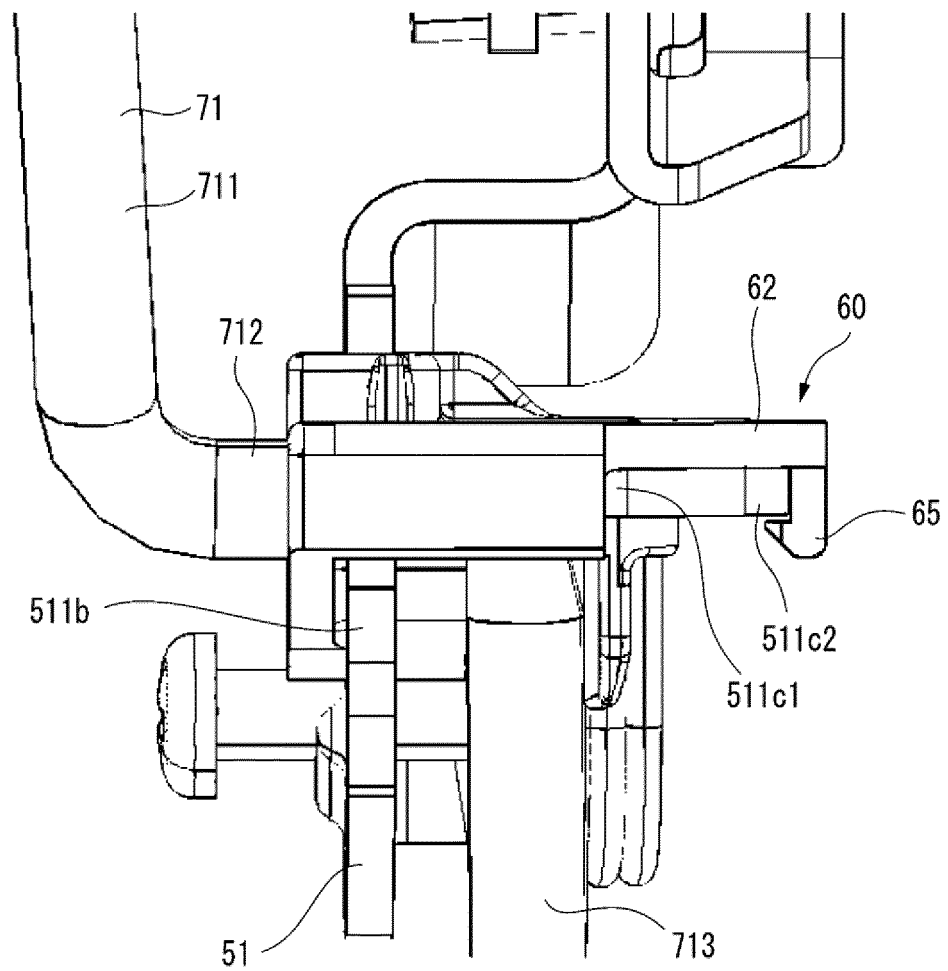
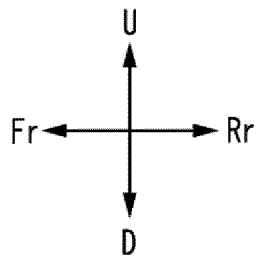


FIG. 9





EUROPEAN SEARCH REPORT

Application Number

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		1 March 2024	Ansel, Yannick
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