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(71) Applicant: **HONDA MOTOR CO., LTD.**
Tokyo, 107-8556 (JP)

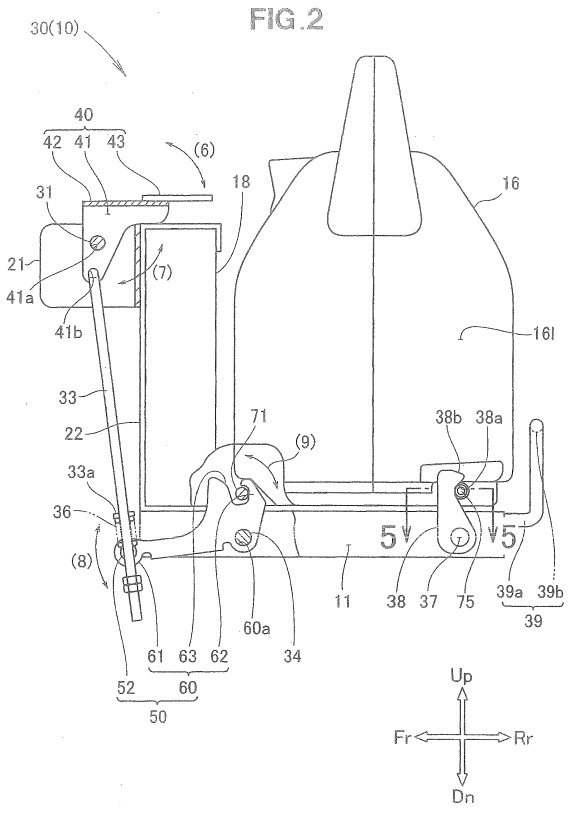
(72) Inventors:
- **OHTA, Yoshitaka**
  Saitama, 351-0193 (JP)
- **HASHIMOTO, Atsushi**
  Saitama, 351-0193 (JP)

(74) Representative: **Herzog, Markus et al**
Weickmann & Weickmann
Patentanwälte
Postfach 86 08 20
81635 München (DE)

(54) MOUNTABLE/DISMOUNTABLE-COMPONENT MOUNTING STRUCTURE FOR A WORKING MACHINE

(57) A structure for mounting a mountable/dismountable component (16) on a machine body (11) of a working machine (10) including: locking sections (38a, 62) provided on the machine body for locking the mountable/dismountable component; and engagement sections (71, 75) provided on the mountable/ dismountable component and engageable by respective ones of the locking sections (38a, 62). The locking sections include: a movable locking section (62) capable of sliding the mountable/dismountable component to a predetermined mounting position on the machine body while locking the first engagement section (71) of the engagement sections; and a fixed locking section (38a) constructed to lock a second engagement section (75), different from the first engagement section, of the engagement sections of the mountable/dismountable component in the predetermined mounting position.

FIG.2



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Description

[0001] The present invention relates to a structure for mounting a mountable/dismountable component on the body of a working machine.

[0002] Some of various working machines, such as agricultural working machines and snow removal machines, are driven by an electric motor. For example, a battery for driving an electric motor is mounted on the body of an electrically-driven working machine. Among the conventionally known techniques concerning a mounting structure for a mountable/dismountable component, such as a battery, is one disclosed in Japanese Utility Model Application Laid-open Publication No. HEI-4-110648 (hereinafter referred to as "Patent Literature 1").

[0003] In the mountable/dismountable component mounting structure disclosed in Patent Literature 1, the body of the working machine has a slit hole and a bolt-connected flange, while the battery has a tongue section and a bolt hole.

[0004] To mount the battery on the machine body, the tongue section of the battery is inserted into the slit hole of the machine body, and then the bolt-connected flange and the bolt hole are interconnected via a bolt. Particularly, in the case of a working machine where the battery is charged indoors, mounting and dismounting of the battery is carried out frequently.

[0005] However, with the mountable/dismountable-component mounting structure disclosed in Patent Literature 1, the bolt might be lost with the battery dismounted from the machine body. In addition, a tool is necessary to attach the bolt, and the operation for mounting the mountable/dismountable component would take much time and labor.

[0006] In view of the foregoing prior art problems, it is an object of the present invention to provide an improved technique which allows a mountable/dismountable component to be mounted on the body of a working machine without using a faster, such as a bolt.

[0007] In order to accomplish the above-mentioned object, the present invention provides an improved structure for mounting a mountable/dismountable component on a machine body of a working machine, which comprises: a plurality of locking sections provided on the machine body for locking the mountable/dismountable component; and a plurality of engagement sections provided on the mountable/dismountable component and engageable by respective ones of the plurality of locking sections, the plurality of locking sections including: a movable locking section capable of sliding the mountable/dismountable component to a predetermined mounting position on the machine body while locking a first engagement section of the engagement sections; and a fixed locking section constructed to lock a second engagement section, different from the first engagement section, of the engagement sections of the mountable/dismountable component in the predetermined mounting position.

[0008] According to the present invention, the machine body has the plurality of locking sections, and the mountable/dismountable component has the plurality of engagement sections engageable by the respective locking sections. The locking sections includes: the movable locking section capable of sliding the mountable/dismountable component to the predetermined mounting position on the machine body while locking the first engagement section of the component; and the fixed locking section constructed to lock the second engagement section of the component in the predetermined mounting position. Namely, by a human operator operating the movable fitting section provided on the machine body, the mountable/dismountable component is locked in the mounting position. Thus, the present invention allows the mountable/dismountable component to be fixedly mounted on the machine body without using a particular fastener, such as a bolt. Besides, there is no need to prepare a particular tool at the time of mounting of the mountable/dismountable component. In this way, the present invention allows the mountable/dismountable component to be mounted on the machine body with utmost ease without using a particular fastener, such as a bolt, and a particular tool.

[0009] Preferably, in the structure of the present invention, the fixed locking section is formed in a hooked shape adapted to opposedly engage the second engagement section sliding toward the mounting position. Various loads tend to be applied to the machine body from outside during operation of the working machine. The fixed locking section is formed in a hooked shape adapted to opposedly engage the second engagement section, and thus, even when a load has been input to the machine body, the present invention can prevent excessive displacement of the mountable/dismountable component.

[0010] Preferably, in the structure of the present invention, the second engagement section is provided on each of left and right sides of the mountable/dismountable component as left and right second engagement sections extending outwardly away from each other in a width direction of the mountable/dismountable component, and the mountable/dismountable component further includes left and right taper sections formed on left and right side portions of the mountable/dismountable component and located inwardly, in the width direction of the mountable/dismountable component, of corresponding ones of the second engagement sections, each of the left and right taper sections tapering continuously to the corresponding second engagement section. In mounting operation, the mountable/dismountable component may sometimes be placed on a position of the machine body deviated from a predetermined position leftward or rightward in the width direction of the machine body. In such a case, as the mountable/dismountable component is slid toward the predetermined mounting position, any one of the left and right taper sections abuts against the corresponding second engagement section. As the mountable/dismountable component is further slid toward the

predetermined mounting position, the mountable/dismountable component is slid laterally toward the centerline, i.e. in a width direction of the machine body, by the action of the slanting surface of the taper section, so that the mountable/dismountable component can be easily mounted on the predetermined mounting position of the machine body. Thus, the mountable/dismountable component can be mounted accurately on the predetermined mounting position through a simple operation by the human operator, i.e. by the human operator operating only the movable locking section.

[0011] Preferably, the structure of the present invention further comprises a push-back portion capable of contacting the first engagement section. When the mountable/dismountable component is to be dismounted from the machine body, the push-back portion abuts against the first engagement section to slide the first engagement section from the mounting position to a position where the mountable/dismountable component is dismountable from the machine body. The human operator can dismount the mountable/dismountable component from the machine body by lifting up mountable/dismountable component located in the dismounting position. In the dismounting operation, it is not necessary for the human operator to slide the mountable/dismountable component to the dismounting position. In this way, the present invention allows the mountable/dismountable component to be easily dismounted from the machine body with a simple operation.

[0012] The following will describe embodiments of the present invention, but it should be appreciated that the present invention is not limited to the described embodiments and various modifications of the invention are possible without departing from the basic principles. The scope of the present invention is therefore to be determined solely by the appended claims.

[0013] Certain preferred embodiments of the present invention will hereinafter be described in detail, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a side view of a snow removal machine where is employed an embodiment of a mountable/dismountable-component mounting structure of the present invention;

Fig. 2 is an enlarged view of principal sections of the snow removal machine shown in Fig. 1;

Fig. 3 is a plan view of the snow removal machine shown in Fig. 2;

Fig. 4 is an enlarged view of a slide plate shown in Fig. 2;

Fig. 5 is a sectional view taken along the 5 - 5 line of Fig. 2;

Fig. 6 is a view explanatory of operation for mounting a battery shown in Fig. 2 on a machine body of the snow removal machine

Fig. 7 is a view explanatory of a step of sliding the battery to a predetermined mounting position;

Fig. 8 (a) - (c) illustrate a relationship between second engagement sections of the battery and movable locking sections of the machine body from a time when the battery shown in Fig. 2 is placed on the machine body to a time when the battery is locked;

Fig. 9 (a) and (b) illustrate a relationship between the second engagement sections and the movable locking sections when the battery shown in Fig. 2 has been slid to a dismounting position; and

Fig. 10 is a view explanatory of operation of a taper section shown in Fig. 5.

[0014] Now, a description will be given about an embodiment of a self-propelled working machine of the present invention in relation to a case where the self-propelled working machine is constructed as a snow removal machine. In the following description, the terms "forward" (Fr), "rearward" (Rr), "left" (L), "right" (R), "upper" (Up), "lower" (Dn), etc. are used to refer to directions as viewed from a human operator operating the snow removal machine. Further, "Ce" in the drawings depicts a direction toward an imaginary center line extending through the width of the working machine.

[0015] Fig. 1 shows an electric snow removal machine 10 as an embodiment of the self-propelled working machine of the present invention, and the snow removal machine 10 travels by means of left and right travel devices 12. A battery 16 is mounted on the body (hereinafter "machine body") 11 of the snow removal machine 10 as an example of a mountable/dismountable component to be mounted on the machine body.

[0016] The snow removal machine 10 includes: a machine body 11; the left and right travel devices 12 provided on the left and right sides of the machine body 11; a snow disposal member (dozer) 13 mounted on a front portion of the machine body 11; a drive source 14 mounted on a middle portion of the machine body 11; and left and right operating handles 15 (only the left operating handle 15 is shown in the figure) mounted on a rear portion of the machine body 11.

[0017] The left and right travel devices 12 are each in the form of a crawler. The snow disposal member (dozer) 13 can push out snow as the snow removal machine 10 is caused to travel forward. The drive source 14, which is for example in the form of an electric motor, drives the left and right travel devices 12. The drive source 14 is supplied with electric power output from the battery 16. The left and right operating handles 15 extend obliquely upward and rearward from the rear portion of the machine body 11 and have left and right grips 17 (only the left grip 17 is shown in the figure) on their respective distal end portions. The human operator can operate the left and right operating handles 15 while waking together with the snow removal machine 10 with the left and right grips 17 held by his or her both hands. Further, a control section 18 for controlling the driving operation of the motor 14 is mounted on the machine body 11.

[0018] Further, a battery attachment/detachment

mechanism 30 is provided on the machine body 11. The battery 16 is mountable and dismountable on and from the machine body 11 by the human operator manipulating the battery attachment/detachment mechanism 30.

[0019] In Fig. 1 to 3, the battery 16 is shown as mounted on and fixed to the machine boy 11; it can also be said that the battery 16 is located in a predetermined mounting position on the machine body 11.

[0020] As shown in Figs. 2 and 3, the battery attachment/detachment mechanism 30 includes: a first shaft member 31 fixed to a stay 21 that is in turn secured to a front portion of the control section 18; a handle plate 40 pivotably connected to the first shaft member 31; a rod 33 pivotably and displaceably connected to the handle plate 40; a second shaft member 34 fixed to a central portion, in a width direction (left-right direction), of the machine body 11; a slide unit 50 connected to the rod 33 and the second shaft member 34 for sliding the battery 16 in a forward-rearward direction; a spring 36 normally biasing the slide unit 50 downwardly and normally biasing the rod 33 upwardly; fastener members 37 fixed to left and right rear side portions of the machine body 11; left and right locking plates 38 fixed to corresponding ones of the fastener members 37; and a guide member 39 fixed to the rear end of the machine body 11.

[0021] The battery 16 includes a front engagement section (also referred to as "first engagement section") 71 fixed to a front middle portion of the battery 16 and engageable by the slide unit 50, and pin-shaped left and right rear engagement sections (also referred to as "second engagement sections") 75 fixed to left and right rear portions of the battery 16 and engageable by the left and right locking plates 38.

[0022] The stay 21 is joined to and supported by a control section support plate 22 that is fixed to the machine body 11 for supporting the control section 18. Thus, it can be said that the stay 21, the first shaft member 31 and the handle plate 40 are supported by the machine body 11.

[0023] The handle plate 40 includes two L-shaped plates 41 each having a generally L shape as viewed in side elevation of the machine body 11, a connection plate 42 joined to the two L-shaped plates 41 to interconnect the L-shaped plates 41, and a grip plate 43 joined to one end portion of the connection plate 42 and capable of being gripped by the human operator in operating the machine 10.

[0024] Each of the L-shaped plates 41 has an insertion hole 41a having the first shaft member 31 inserted therethrough, and only one of the L-shaped plates 41 has a rod insertion hole 41b having the rod 33 inserted therethrough.

[0025] The grip plate 43 is fixed to a distal end portion of the connection plate 42 and extends rearward away from the first shaft member 31 beyond the distal end of one side of the L-shaped plates 41. The rod 33 has an upper end portion inserted through the hole 41b formed in a corner portion of the plate 41 near the distal end of another side (vertical side in Fig. 2). The first shaft member 31 is inserted through the insertion hole 41a near a middle portion of the other side of the L-shaped plate 41.

[0026] The rod 33 is a rod-shaped member of a generally L shape having an upper end portion bent toward the L-shaped plate 41. The rod 33 has an abutment section 33a on a lower portion thereof, and a spring 36 is abutted at one end against the abutment section 33a. The abutment section 33a may be formed, for example, by crushing the lower portion of the rod 33.

[0027] Referring now to Figs. 2 and 4, the slide unit 50 includes two, i.e. left and right, slide plates 60 disposed in such a manner that the rod 33 is disposed between the slide plates 60, and these left and right slide plates 60 are interconnected by a pin-shaped slide plate connecting member 52. The pin-shaped slide plate connecting member 52 is pivotably fitted in the left and right slide plates 60. The pin-shaped slide plate connecting member 52 is connected to the rod 33 while permitting displacement of the rod 33. The pin-shaped slide plate connecting member 52 is displaceable in interlocked relation to displacement of the rod 33.

[0028] Because the two left and right slide plates 60 are similar to each other in construction and operation, the following mainly describe the construction and operation of the right slide plate 60, omitting a detailed description about the construction and operation of the left slide plate 60 to avoid unnecessary duplication.

[0029] The slide plate 60 has a shape of a combination wrench. The pin-shaped slide plate connecting member 52 is inserted through a ring section 61 of a generally circular hole shape formed in one end of the slide plate 60. Further, the slide plate 60 has a movable locking section 62 and a push-back portion 63 on the other end formed as an upwardly-opening section. The movable locking section 62 is formed in a forwardly-oriented hooked shape for locking the front (first) engagement section 71, and the push-back portion 63 is formed in a curved shape and functions to abut against the front engagement section 71 to move the battery 16 rearward at the time of dismounting of the battery 16 from the machine body 11

[0030] Further, at the other end of the slide plate 60 is formed an insertion hole 60a through which the second shaft member 34 is inserted, so that the slide plate 60 is pivotable about the second shaft member 34.

[0031] From the foregoing, it can be said that the rod 33 is pivotable at its upper end about the first shaft member 31 and pivotable at its connection with the slide blade 60 about the second shaft member 34.

[0032] Referring now to Figs. 2, 3 and 5, the left and right fixed locking plates 38 are similar to each other in construction, operation and shape. The following mainly describe the construction and operation of the left fixed locking plate 38, omitting a detailed description about the construction and operation of the right locking plate 38 to avoid unnecessary duplication.

[0033] The fixed locking plate 38, which has a rear-

wardly-oriented hooked shape, includes the fixed locking section 38a that locks the left rear (second) engagement section 75. An upper end portion 38b of the locking plate 38 is formed in a rearward downward slope; that is, the upper end portion 38b has an upper surface slanting rearwardly and downwardly.

[0034] As shown particularly in Fig. 5, the battery 16 has: a disk-shaped large-diameter section 73 integrally formed on a left side surface portion 161 of the battery 16; a taper section 74 continuously tapering from the outer surface of the large-diameter section 73 outward in a width direction of the battery 16; and the pin-shaped rear engagement section 75 integrally formed on and extending outwardly, in the width direction of the battery 16, from the outer surface of the taper section 74.

[0035] The right rear engagement section 75 is similar in construction to the left rear engagement section 75, as seen from Fig. 3. Namely, the battery 16 has: a disk-shaped large-diameter section 73 integrally formed on a right side surface portion 16r; a taper section 74 continuously tapering from the outer surface of the large-diameter section 73; and the pin-shaped rear engagement section 75 integrally formed on and extending outwardly, in the width direction of the machine body 11, from the outer surface of the taper section 74.

[0036] As shown in Figs. 2 and 3, the guide member 39 of the machine body 11 includes left and right guide member base sections 39a each having a generally L shape as viewed in side elevation of the machine body 11, and a guide section 39 extending in the width direction of the machine body 11 to interconnect the respective upper ends of the left and right guide member base sections 39a.

[0037] As the human operator moves the grip plate 43 in an up-down direction while holding the grip plate 43, the L-shaped plate 41 pivots about the first shaft member 31 in the up-down direction, in response to which the rod 33 moves in the front-rear and up-down directions. In response to such movement of the rod 33, the slide plate 60 pivots about the second shaft member 34.

[0038] The following describe, with particular reference to Figs. 6 to 9, how the battery 16 is mounted on the machine body 11 (in the mounting operation) and how the battery 10 is dismounted from the machine body 11 (in the dismounting operation).

[0039] In the mounting operation, the human operator lowers the battery 16 onto the machine body 11 in such an orientation that the width direction of the battery 16 corresponds to the width direction of the machine body 11, and in such a manner that the front engagement section 71 is located between the movable locking sections 62 and the push-back portions 63 of the left and right slide plates 60 as indicated by arrow (1) in Figs. 6 and 8(a) and that the left and right rear engagement sections 75 (only the left rear engagement section 75 is shown in the figures) of the battery 16 are lowered to be located behind the fixed locking sections 38a of the left and right locking plates 38.

[0040] Then, the human operator holds the grip plate 43 so as to cause the grip plate 43 to pivot upward as indicated by arrow (2) in Fig. 7, so that the slide plates 60 pivot as indicated by arrow (3) in Fig. 7 and 8(b). Thus, the movable locking section 62 of each of the slide plates 60 abuts against the front engagement section 71.

[0041] Then, the human operator further causes the grip plate 43 to pivot in the direction of arrow (2) in Fig. 7, so that the movable locking sections 62 slides the battery 16 from the placed position forward as indicated by arrow (4) while still locking the front engagement section 71. Then, by the human operator further causing the grip plate 43 to pivot in the direction of arrow (2), the battery 16 can be slid to and fixed in the mounting position (see Fig. 2).

[0042] With the battery 16 thus fixed in the mounting position, the rear surface and upper surface of the front engagement section 71 is engaged by the movable locking sections 62, as particularly shown in Fig. 8(c), and the front and upper surfaces of the left and right rear engagement sections 75 are engaged by the fixed locking sections 38a of the left and right locking plates 38.

[0043] Further, in the instant embodiment, a climb-over mechanism may be employed as appropriate in order to prevent the grip plate 43 from pivoting in an opposite direction due to vibration caused during the operation of the machine. Namely, it is preferable that the grip plate 43 be constructed to not pivot unless external force is intentionally applied to the grip plate 43. The climb-over mechanism may be implemented by one well known in the art.

[0044] To dismount the battery 16, the human operator causes the grip plate 43 to pivot in a direction opposite the direction the grip plate 43 was caused to pivot for mounting the battery 16, as indicated by arrow (6) in Fig. 2. In response to such pivoting of the grip plate 43 in the opposite direction, the push-back portion 63 of each of the slide plates 60 abuts against the front engagement section 71 as shown in Fig. 9(a).

[0045] Then, as the human operator further causes the grip plate 43 to pivot in the direction of arrow (6), the push-back portion 63 of each of the slide plates 60 pushes the front engagement section 71 back rearward as indicated by arrow (10). Thus, the battery 16 is moved rearward. Once the battery 16 is moved back to a predetermined position, the human operator lifts up the battery 16.

[0046] The instant embodiment of the present invention arranged in the above-described manner can achieve the following advantageous benefits.

[0047] Referring to Fig. 2, the machine body 11 has the plurality of locking sections 62 and 38a provided thereon, and the battery 16 has the plurality of engagement sections 71 and 75 engageable by the locking sections 62 and 38a. The movable locking sections 62 can slide the battery 16 to the predetermined mounting position while locking the front (first) engagement section 71. The fixed locking sections 38a lock the left and right rear (sec-

ond) engagement sections. Namely, the battery 16 can be locked in the mounting position by the human operator operating the movable locking sections 62 (by means of the grip plate 43) provided on the machine body 11. That is, the battery 16 can be fixed to the machine body 11 without a particular fastener, such as a bolt.

[0048] Besides, the battery 16 can be locked in the predetermined mounting position by the human operator operating only the movable locking sections 62 (grip plate 43). Therefore, no tool has to be prepared at the time of the mounting of the battery 16, and thus, the battery 16 can be mounted on the machine body 11 with utmost ease. In this way, the instant embodiment allows the battery 16 to be mounted on the machine body 11 with utmost ease without using any particular fastener, such as a bolt.

[0049] Further, at the time of dismounting of the battery 16 from the machine body 11, the push-back portions 63 abut against the front engagement section 71 and slides the front engagement section 71 from the mounting position to a dismounting position where the battery 16 can be dismounted from the mounting position (see Fig. 9(b)). Then, the human operator can dismount the battery 16 from the machine body 11 by lifting up the battery 16 located in the dismounting position. In the dismounting operation of the battery 16, it is not necessary for the human operator to slide the battery 16 to the dismounting position. In this way, the instant embodiment allows the battery 16 to be dismounted from the machine body 11 easily with a simple operation.

[0050] Various loads tend to be applied to the machine body 11 from outside during operation of the snow removal machine 10. Each of the fixed locking sections 38a is formed in a hooked shape adapted to opposedly engage the corresponding one of the left and right rear engagement sections 75 sliding toward the mounting position, and thus, even when a load has been input to the machine body 11, the instant embodiment can prevent excessive displacement of the battery 16.

[0051] Further, the spring 36 normally biases the slide unit 50 downwardly and normally biases the rod 33 upwardly, and the rod 33 is pivotably connected at its upper end to the handle plate 40 and pivotably connected at its lower portion to the slide unit 50. To permit such pivotable connection, slight gaps are formed between the rod 33 and the handle plate 40 and between the rod 33 and the slide unit 50. Due to vibration that can occur during the operation of the snow removal machine 10, the rod 33 may contact the handle plate 40 and/or the slide unit 50, thereby causing unwanted noise sound. To avoid such noise sound, the rod 33 is resiliently pressed by the spring 36 against the hand plate 40 with a predetermined force, but also the slide unit 50 is resiliently pressed by the spring 36 against the rod 33 with a predetermined force. With such arrangements, the instant embodiment can reliably prevent noise sound from being generated between the rod 33 and the hand plate 40 and the slide unit 50 due to vibration of the machine 10.

[0052] In placing the battery 16 on the machine body 11, the human operator lowers the battery 16 toward the machine body 11 while viewing the guide member 39 (guide section 39b) from above, as seen in Fig. 3. At that time, the human operator places the battery 16 in front of the guide member 39. Namely, the guide member 39 serves as a guide for positioning the battery 16 in a predetermined position. Thus, with the guide member 39, the battery 16 can be placed on the predetermined placed position of the machine body 11 where the movable locking sections 62 of the left and right slide plates 60 can lock the front engagement section 71. Namely, with the guide member 39, the instant embodiment allows the human operator to readily recognize the predetermined position where the battery 16 should be placed.

[0053] In placing the battery 16 on the machine body 11, the human operator may sometimes lower the battery 16 onto the machine body 11 in front of the predetermined position. In such a case, each of the left and right rear engagement sections 75 abuts against the upper end portion 38b of the locking plate 38 shown in Fig. 8(a). The upper end portion 38b of the locking plate 38 is formed in a rearward downward slope as noted above, and thus, as the human operator further lowers the battery 16, the battery 16 can be placed on the predetermined position by being guided rearward along the sloping upper end portion 38b of the locking plate 38.

[0054] Further, as shown in Figs. 3 and 10(a), the left and right left and right rear (or second) engagement sections 75 are integrally formed on and extending outwardly, in the battery width (left-right) direction, from the outer surfaces of the taper sections 74 that are disposed inwardly of the corresponding left and right engagement sections 75 and continuously taper toward the corresponding engagement sections 75. Thus, if the battery 16 placed on the machine body 11 is deviated leftward from the predetermined position with the engagement section 75 spaced outwardly from the fixed locking section 38a, the slanting surface of the left taper section 74 abuts against the fixed locking section 38a.

[0055] Then, as the battery 16 is slid toward the mounting position, it is slid laterally toward the centerline (in the direction Ce) of the machine body 11 by the action of the slanting surface of the left taper section 74 as depicted by arrow (20) in Fig. 10(b). Thus, the battery 16 can be mounted on the predetermined mounting position. Similarly, if the battery 16 placed on the machine body 11 is deviated rightward from the predetermined position, the battery 16 can be slid laterally toward the centerline (in the direction Ce) of the machine body 11 by the action of the slanting surface of the right taper section 74 (see Fig. 3). In this way, the battery 16 can be accurately mounted on the predetermined mounting position through a simple operation by the human operator, i.e. by the human operator operating only the movable locking sections 62 (see Fig. 2).

[0056] Whereas the mountable/dismountable-component mounting structure of the present invention has

been described above as mounting the battery on the snow removal machine, the mountable/dismountable component to be mounted by the mounting structure of the present invention may be a gas tank or the like other than the battery. Further, the working machine on which the mountable/dismountable component is to be mounted by the mounting structure of the invention may be a lawn mower, a cultivating machine or the like other than the snow removal machine.

[0057] It should be appreciated that the present invention is not limited to the above-described embodiment and may be modified variously as long as the intended operation and advantageous benefits can be attained.

[0058] Finally, the mountable/dismountable-component mounting structure of the present invention is particularly well suited for application to mounting of batteries on snow removal machines.

[0059] A structure for mounting a mountable/dismountable component (16) on a machine body (11) of a working machine (10) including: locking sections (38a, 62) provided on the machine body for locking the mountable/dismountable component; and engagement sections (71, 75) provided on the mountable/ dismountable component and engageable by respective ones of the locking sections (38a, 62). The locking sections include: a movable locking section (62) capable of sliding the mountable/dismountable component to a predetermined mounting position on the machine body while locking the first engagement section (71) of the engagement sections; and a fixed locking section (38a) constructed to lock a second engagement section (75), different from the first engagement section, of the engagement sections of the mountable/dismountable component in the predetermined mounting position.

Claims

1. A structure for mounting a mountable/dismountable component (16) on a machine body (11) of a working machine (10), comprising:

   a plurality of locking sections (38a, 62) provided on the machine body (11) for locking the mountable/dismountable component (16); and
   a plurality of engagement sections (71, 75) provided on the mountable/dismountable component (16) and engageable by respective ones of the plurality of locking sections (38a, 62),
   the plurality of locking sections including:

      a movable locking section (62) capable of sliding the mountable/dismountable component (16) to a predetermined mounting position on the machine body while locking a first engagement section (71) of the engagement sections; and
      a fixed locking section (38a) constructed to lock a second engagement section (75), different from the first engagement section (71), of the engagement sections of the mountable/dismountable component in the predetermined mounting position.

2. The structure of claim 1, wherein the fixed locking section (38a) is formed in a hooked shape adapted to opposedly engage the second engagement section (75) sliding toward the mounting position.

3. The structure of claim 1 or 2, wherein the second engagement section (75) is provided on each of left and right sides of the mountable/dismountable component (16) as left and right second engagement sections (75) extending outwardly away from each other in a width direction of the mountable/dismountable component (16), and
   wherein the mountable/dismountable component (16) further includes left and right taper sections (74) formed on left and right side portions of the mountable/dismountable component (16) and located inwardly, in the width direction of the mountable/dismountable component, of corresponding ones of the second engagement sections (75), each of the left and right taper sections (74) tapering continuously to the corresponding second engagement section (75).

4. The structure of any one of claims 1 to 3, which further comprises a push-back portion (63) capable of contacting the first engagement section (71), and
   wherein, when the mountable/dismountable component (16) is to be dismounted from the machine body (11), the push-back portion (63) abuts against the first engagement section (71) to slide the first engagement section (71) from the mounting position to a position where the mountable/dismountable component (16) is dismountable from the machine body (11).

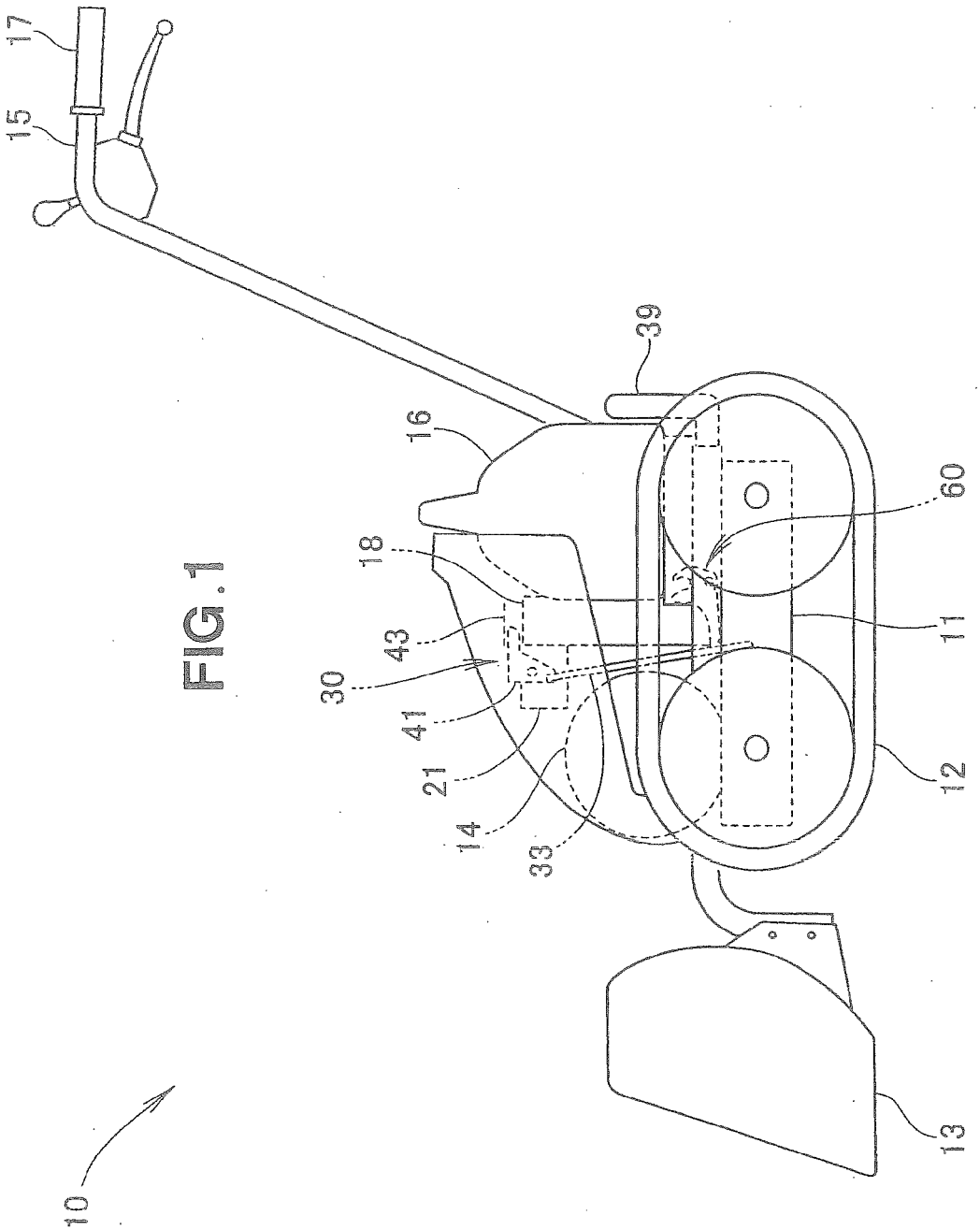
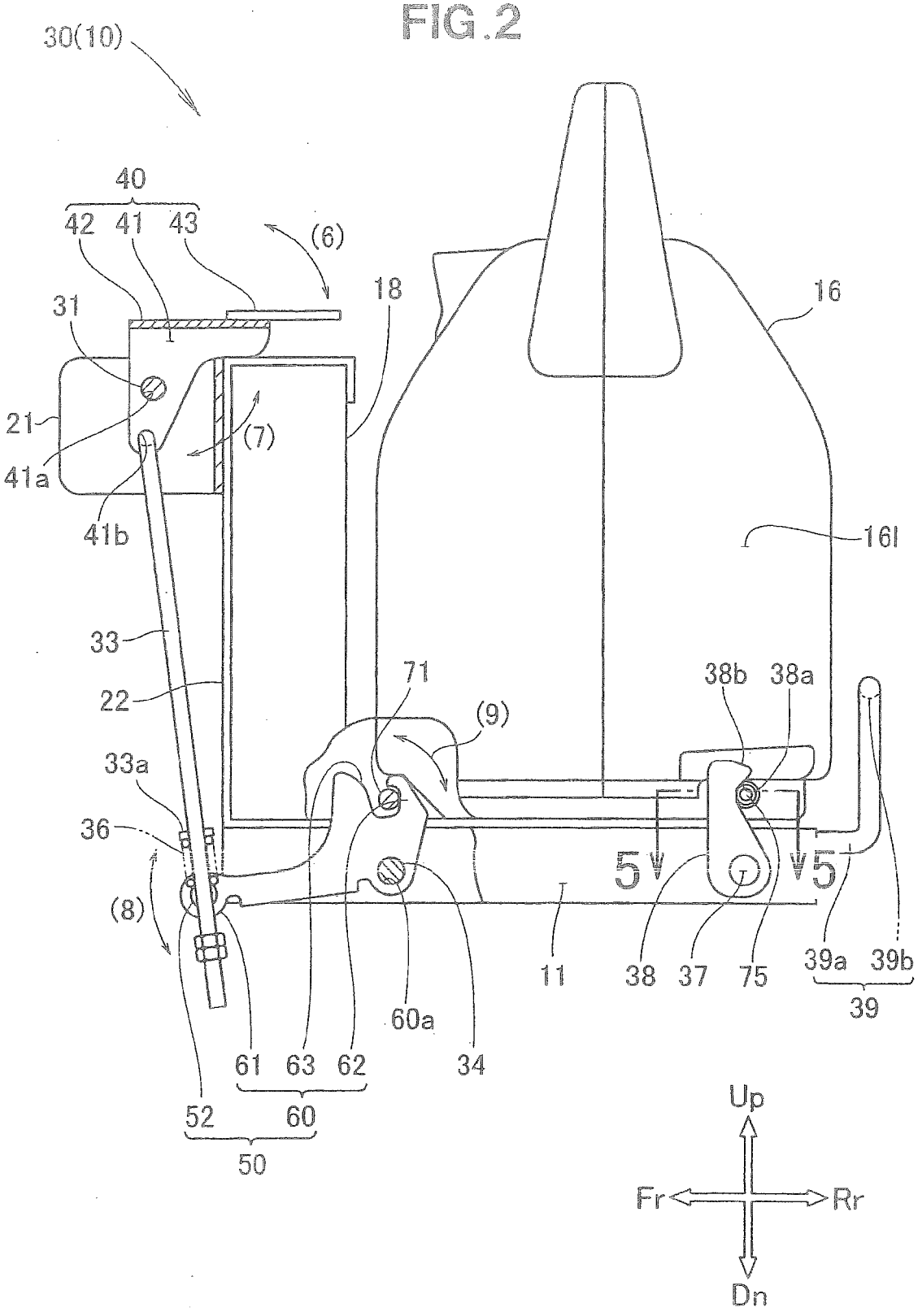


FIG. 1

FIG.2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36
(8)
5
5
11
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63
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34
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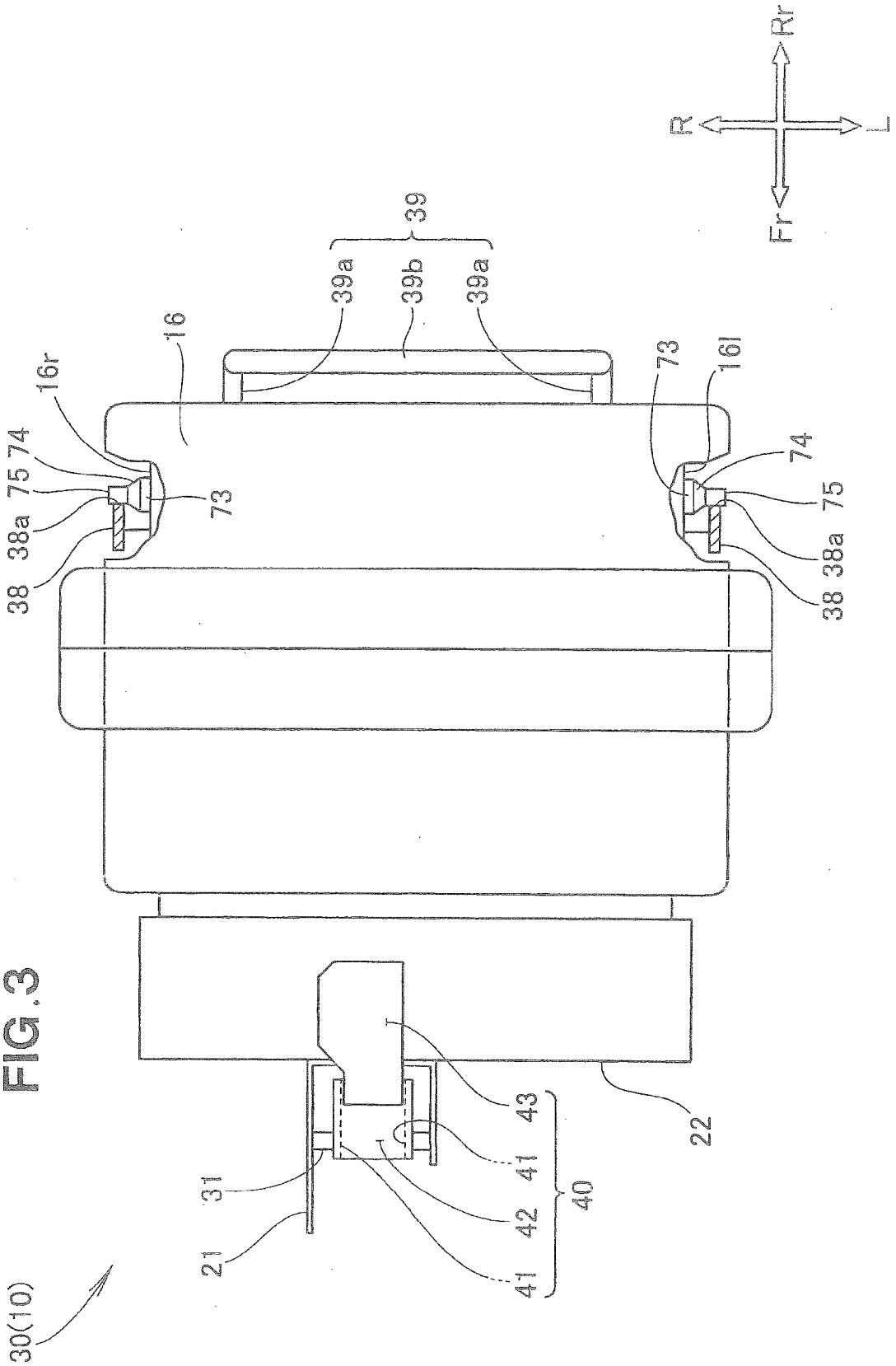
60
50
Up
Fr
Rr
Dn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38a
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30(10)

FIG.3

FIG.4

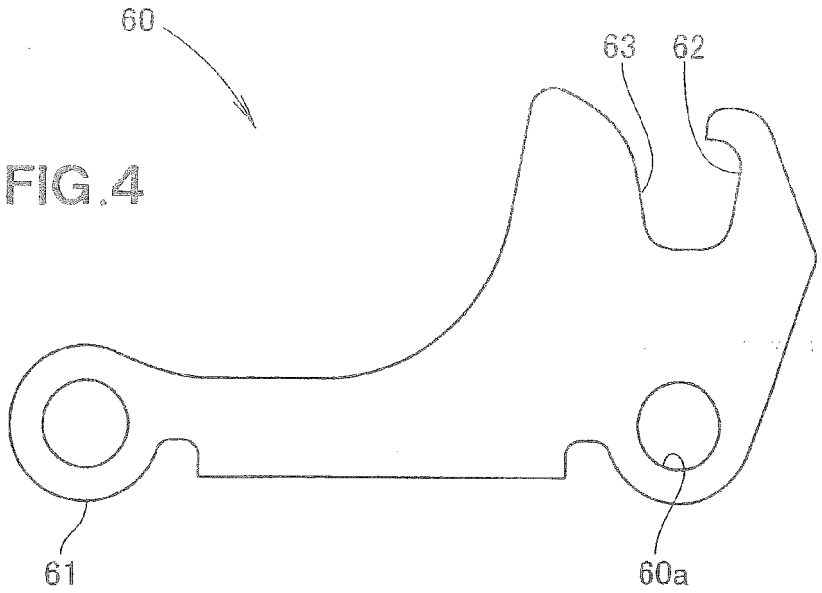

FIG.5

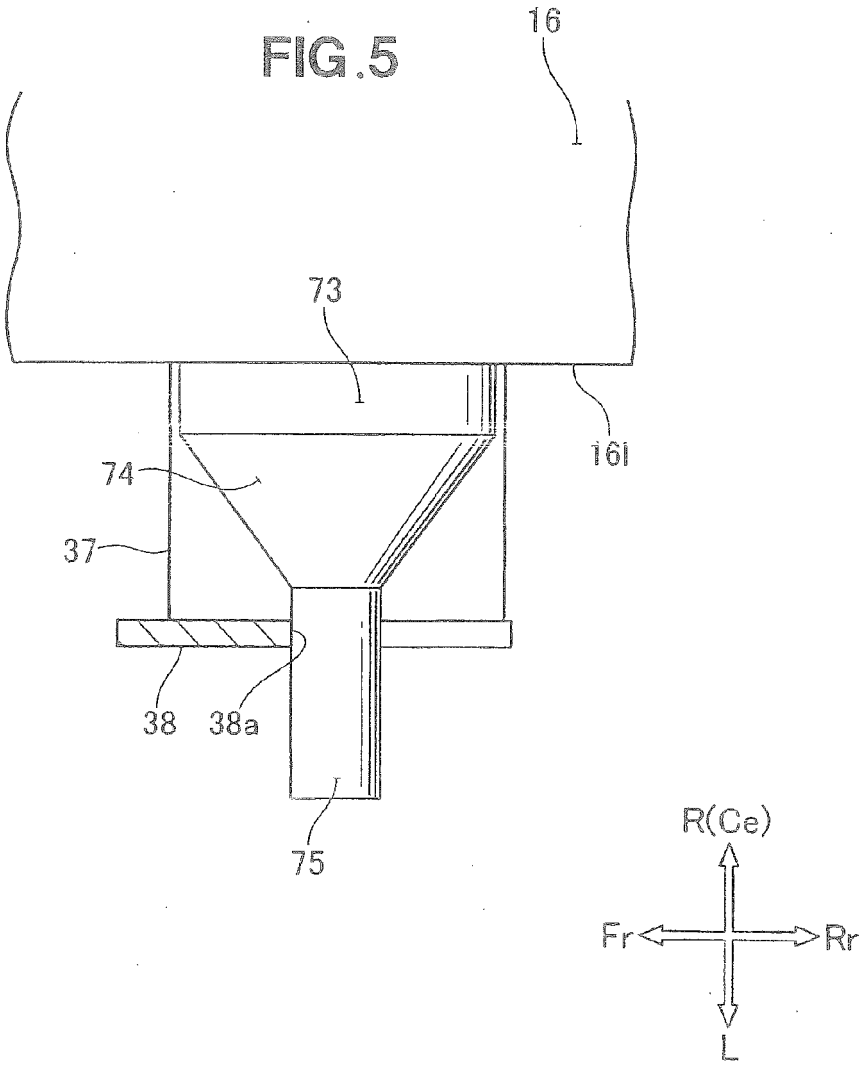

FIG.6

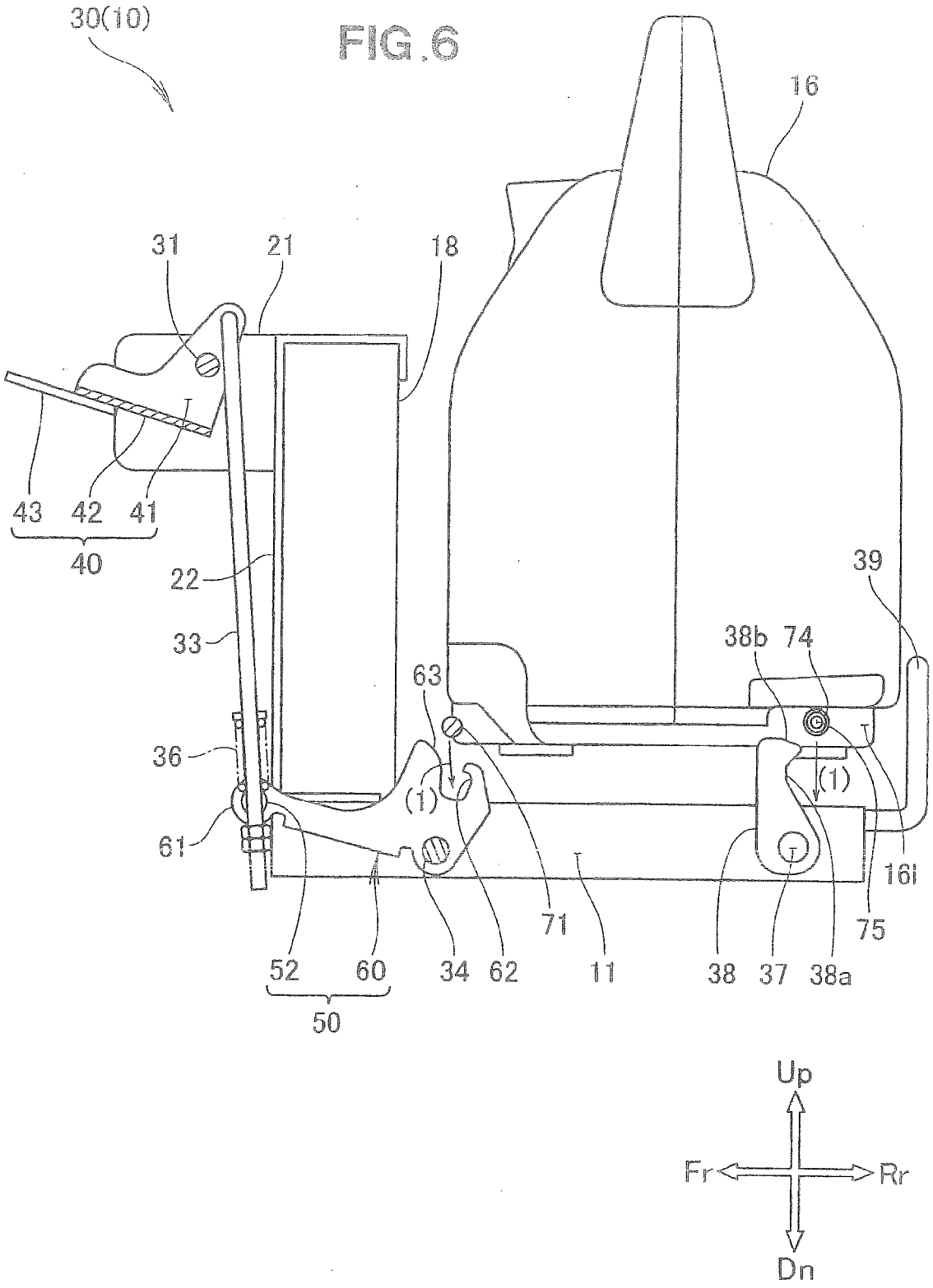
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FIG.7

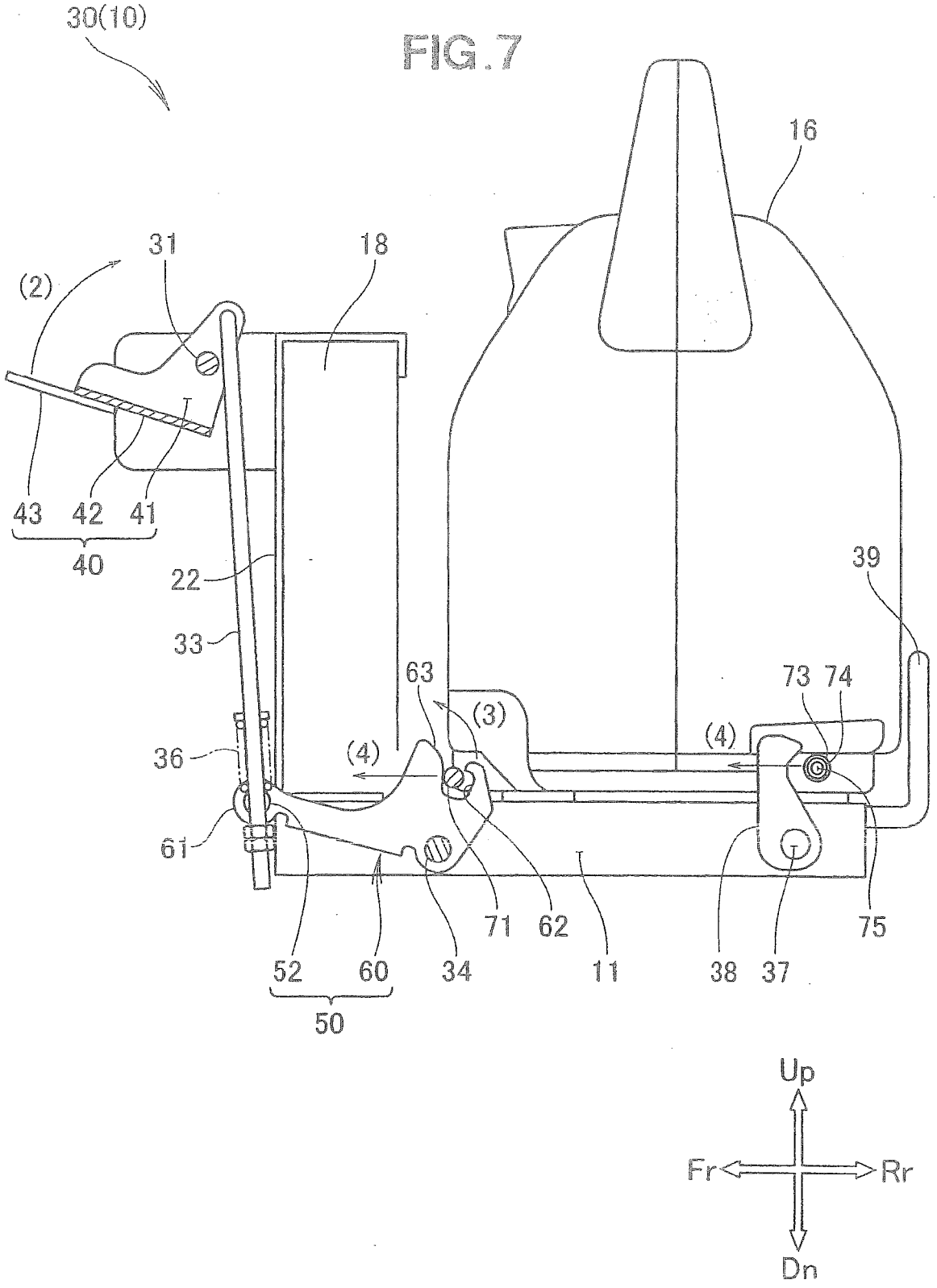
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FIG. 8

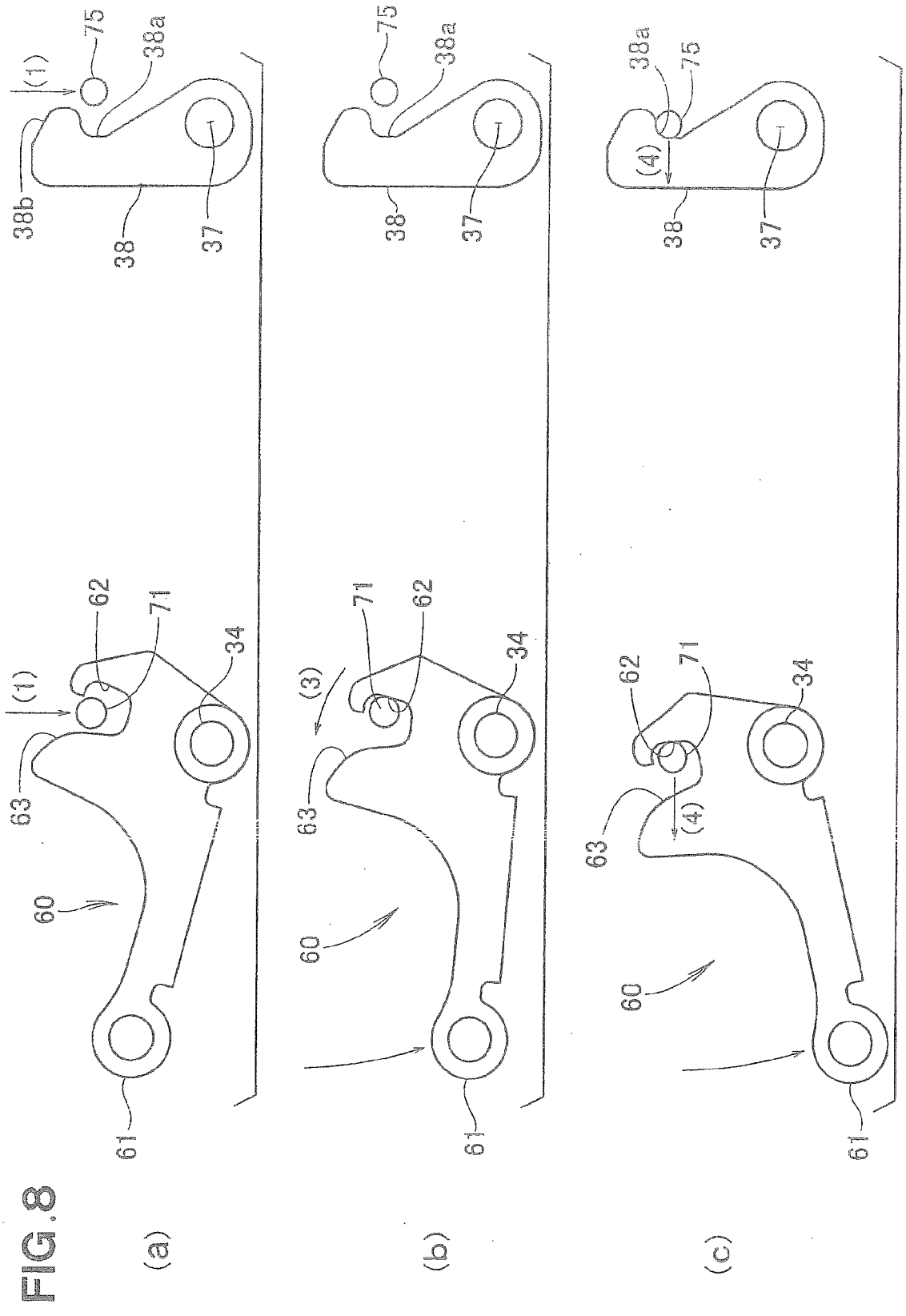
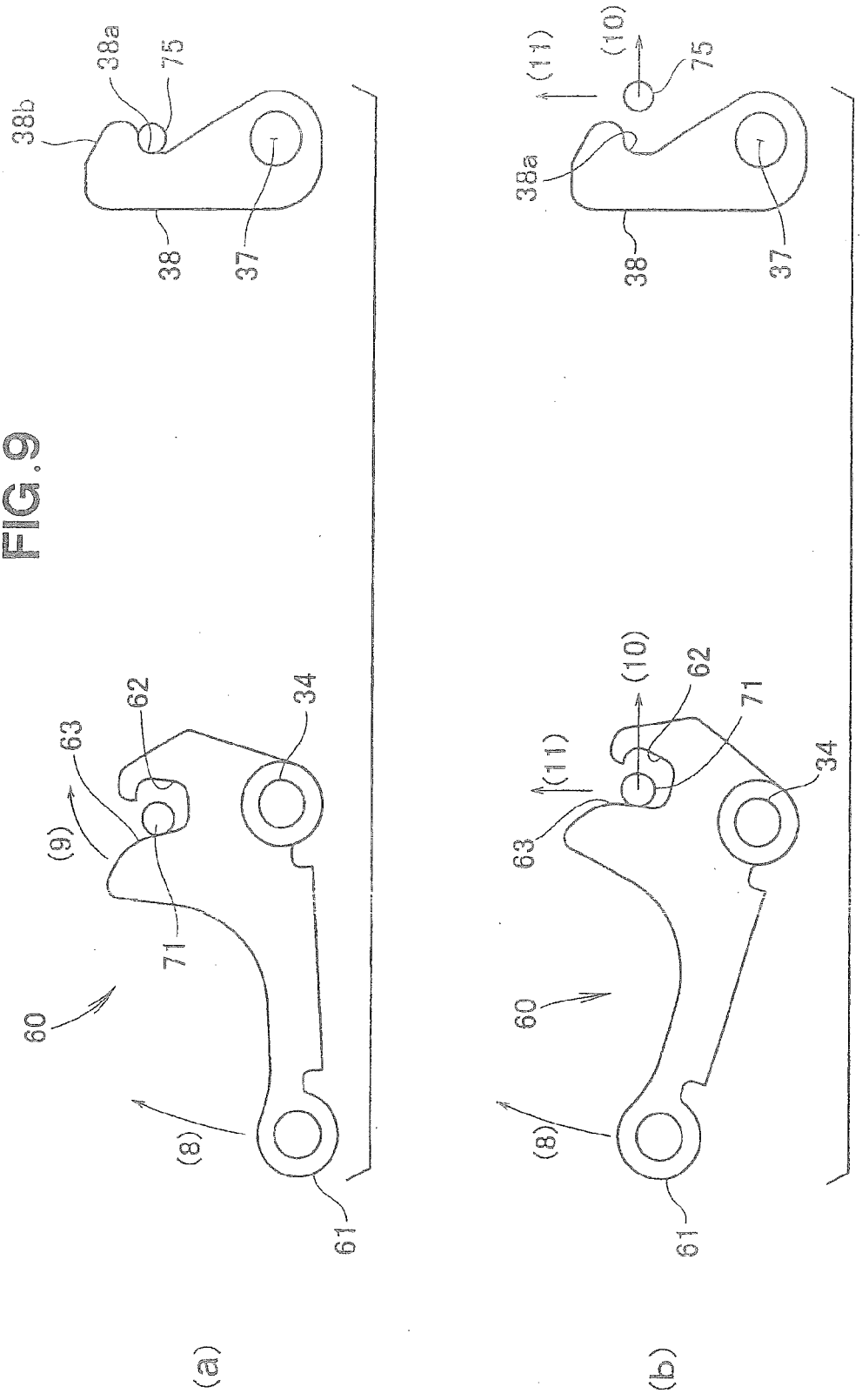


FIG. 9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(8)
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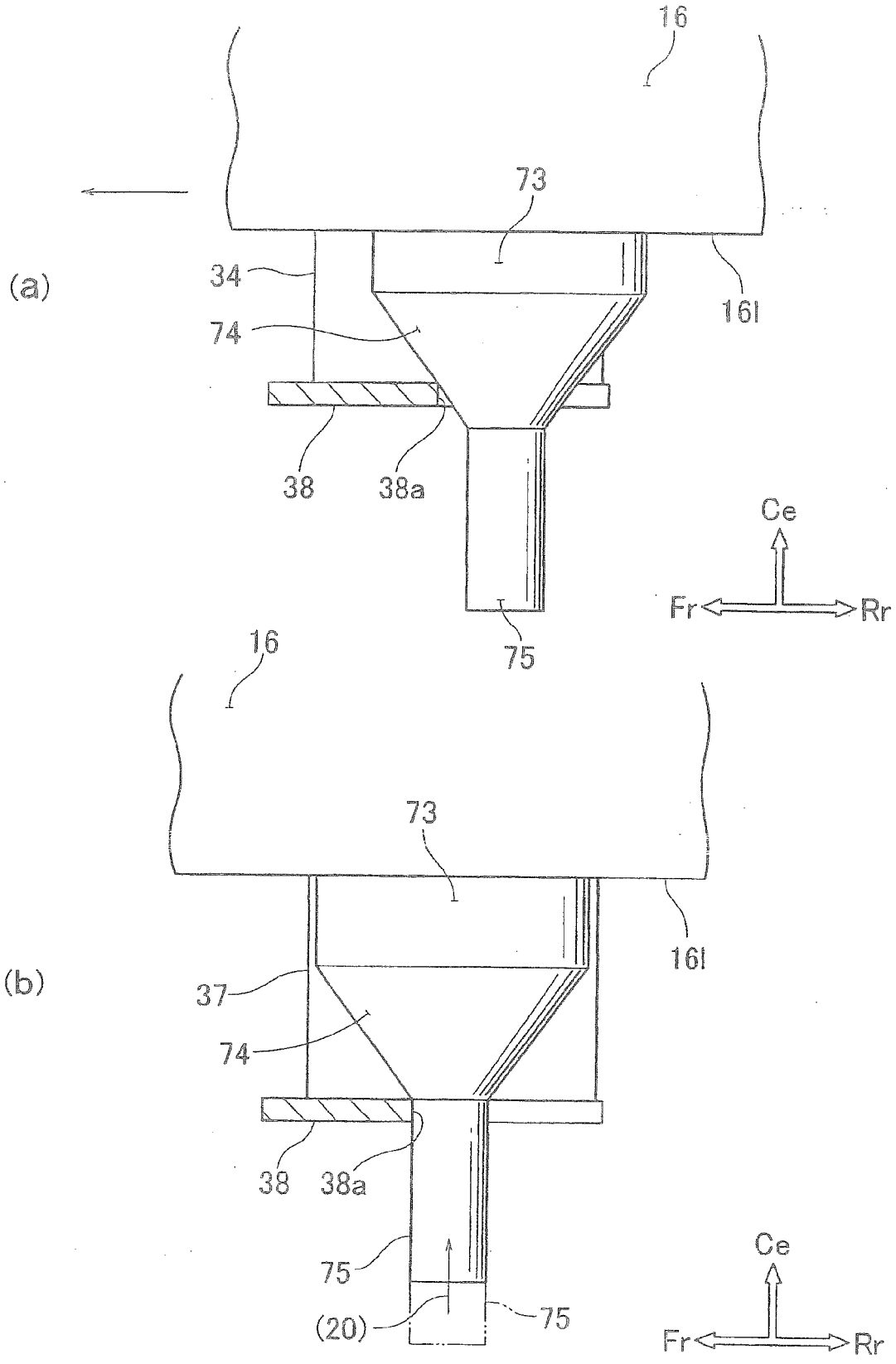
(10)
62
71
(11)
63
34
60
(8)
61

FIG.10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75
(20)
75
Ce
Fr
Rr

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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
Munich	4 January 2016	Papadimitriou, S

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Application Number
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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
Munich	4 January 2016	Papadimitriou, S

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