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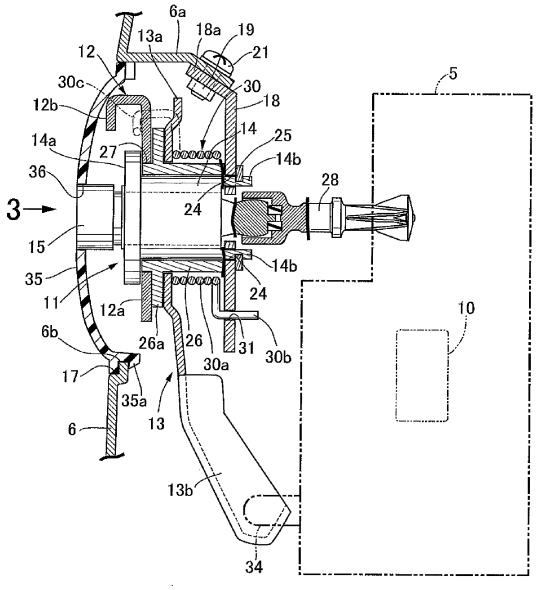
(54) Latch releasing system for vehicle door

(57) To enable a reduction in the number of components, an improvement in an assembling work, and a reduction in the size of a door (D) in a latch releasing system for a vehicle door (D), comprising: a latch mechanism (5) being capable of switching between an unlocked state and a locked state, and capable of actuating an electric actuator (10) in the unlocked state and the latch releasing in accordance with a mechanical input of a latch-releasing operation force; an emergency operation member (12) capable of being operated from outside of the door (D) in such a manner as to mechanically input the latch-releasing operation force; and a cylinder lock (11) configured to switch the unlocked state and the locked state of the latch mechanism (5). According to the invention, an emergency operation member (12) is assembled to a cylinder lock (11) attached to a door (D), and a single relay member (13) is directly connected to an input member (34) of a latch mechanism (5), the single relay member (13) being integrally connected to the emergency operation member (12) or being connected thereto as a separate body and operating together.

FIG.2



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Description

[TECHNICAL FIELD]

[0001] The present invention relates to a latch releasing system for a vehicle door, comprising: a latch mechanism having an electric actuator and being capable of switching between an unlocked state enabling latch releasing of a door and a locked state disabling the latch releasing of the door, and capable of actuating the electric actuator in the unlocked state and the latch releasing in accordance with a mechanical input of a latch-releasing operation force; an emergency operation member capable of being operated from outside of the door in such a manner as to mechanically input the latch-releasing operation force to the latch mechanism; and a cylinder lock configured to switch the unlocked state and the locked state of the latch mechanism in accordance with an operation through a mechanical key.

[BACKGROUND ART]

[0002] The following latch releasing system for a vehicle door has been already known by Patent Document 1, in which when a latch mechanism is in an unlocked state, a latch is released by actuating an electric motor of the latch mechanism through an operation of a door switch provided to a door. The latch releasing system for a vehicle door includes an emergency operation member, which is provided to the door and can be operated from the outside of the vehicle. The emergency operation member is to mechanically input a latch-releasing operation force to the latch mechanism in a case where electrical latch releasing of the latch mechanism is impossible due to a dead battery or the like.

[PRIOR ART DOCUMENT]

[PATENT DOCUMENT]

[0003] [Patent Document 1] Japanese Patent No. 4598668

[SUMMARY OF THE INVENTION]

[PROBLEM TO BE SOLVED BY THE INVENTION]

[0004] Meanwhile, Patent Document 1 above discloses that a link mechanism configured to transmit a mechanical latch-releasing operation force to the latch mechanism in accordance with an operation on the emergency operation member is provided between the emergency operation member and the latch mechanism. Not only is the number of components increased, but also the assembling work for assembling the link mechanism is cumbersome. In addition, it is necessary to secure a space for disposing the link mechanism within a narrow space in a door, and this may consequently increase the size of the door.

[0005] The present invention has been made in view of such a circumstance. An object of the present invention is to provide a latch releasing system for a vehicle door, enabling a reduction in the number of components, an improvement in the assembling work, and a reduction in the size of a door.

[MEANS TO SOLVE THE PROBLEMS]

[0006] In order to achieve the object, according to a first feature of the present invention, there is provided a latch releasing system for a vehicle door, comprising: a latch mechanism having an electric actuator and being capable of switching between an unlocked state enabling latch releasing of a door and a locked state disabling the latch releasing of the door, and capable of actuating the electric actuator in the unlocked state and the latch releasing in accordance with a mechanical input of a latch-releasing operation force; an emergency operation member capable of being operated from outside of the door in such a manner as to mechanically input the latch-releasing operation force to the latch mechanism; and a cylinder lock configured to switch the unlocked state and the locked state of the latch mechanism in accordance with an operation through a mechanical key, characterized in that the emergency operation member is assembled to the cylinder lock attached to the door, and a single relay member is directly connected to an input member of the latch mechanism, the single relay member being integrally connected to the emergency operation member or being connected thereto as a separate body and operating together.

[0007] Further, according to a second feature of the present invention, in addition to the configuration of the first feature, the emergency operation member is rotatably supported by the cylinder lock.

[0008] According to a third feature of the present invention, in addition to the configuration of the first or second feature, the cylinder lock and the emergency operation member are covered by a cover member detachably mounted to an outer panel of the door in such a manner that a key hole of the cylinder lock is exposed to the outside.

[EFFECTS OF THE INVENTION]

[0009] According to the first feature of the present invention, the single relay member is directly connected to the input member of the latch mechanism, the single relay member being integrally connected to the emergency operation member or being connected thereto as a separate body and operating together. Furthermore, the emergency operation member is assembled to the cylinder lock. Accordingly, this enables a reduction in the number of components and eliminates the need for securing a large space within the door. Thus, it is made possible to reduce the size of the door and to improve the assembling work-

ability.

[0010] Moreover, according to the second feature of the present invention, since the emergency operation member is rotatably supported by the cylinder lock, a dedicated member for operably supporting the emergency operation member is no longer necessary. A further reduction in the number of components is possible.

[0011] Further, according to the third feature of the present invention, the cover member covers the cylinder lock and the emergency operation member. Accordingly, undesirable operations on the emergency operation member by mischief or the like can be suppressed.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[0012]

[FIG. 1] It is a side view of an essential portion of a passenger vehicle.

[FIG. 2] It is an enlarged sectional view taken along a line 2-2 in FIG. 1.

[FIG. 3] It is a side view seen from an arrow 3 in FIG. 2 with a door and a cover member being omitted.

[FIG. 4] It is a side view corresponding to FIG. 3 in a state where an emergency operation member is operated.

[MODE FOR CARRYING OUT THE INVENTION]

[0013] Hereinafter, an embodiment of the present invention will be described with reference to FIGS. 1 to 4 attached hereto. At first, referring to FIG. 1, a latch mechanism 5 is provided to a vehicle door, for example, a front side door D of a passenger vehicle. The latch mechanism 5 is capable of switching between a latched state where the front side door D in a closed state is engaged with and held to a vehicle body B side and an unlatched state where an opening operation on the front side door D is possible. Moreover, an outer handle 7 for a vehicle user to grip in opening or closing the front side door D is attached to an outer surface of an outer panel 6 of the front side door D. At a portion on the outer surface of the outer panel 6 corresponding to the outer handle 7, a recessed insertion section 8 for inserting a hand to grip the outer handle 7 is formed. Further, a touch sensor 9 is additionally provided to the outer handle 7 to verify that the vehicle user has gripped the outer handle 7 to open the front side door D.

[0014] Referring to FIG. 2 together, the latch mechanism 5 has an electric motor 10, which is an electric actuator. The latch mechanism 5 is capable of switching between an unlocked state enabling latch releasing of the front side door D and a locked state disabling the latch releasing of the front side door D. Moreover, the latch mechanism 5 is capable of actuating the electric motor 10 in the unlocked state and latch releasing in accordance with a mechanical input of a latch-releasing operation force.

[0015] Further, once the touch sensor 9 verifies that the vehicle user grips the outer handle 7 to open the front side door D while the closed front side door D is in a latched state, an ID signal is wirelessly transferred between the vehicle and a legitimate portable device possessed by the vehicle user. With the legitimate ID signal, the latch mechanism 5 switches the locked state to an unlocked state. Then, the electric motor 10 is actuated, and the latch mechanism 5 releases the latched state of the front side door D.

[0016] Meanwhile, to prepare for a case where electrical latch releasing by the latch mechanism 5 is impossible due to a dead battery or the like, a cylinder lock 11 is provided at a position next to the outer handle 7 in the outer panel 6 of the front side door D. The cylinder lock 11 is configured to switch the latch mechanism 5 from a locked state to an unlocked state. An emergency operation member 12 is assembled to the cylinder lock 11 and is capable of being operated from the outside of the front side door D in such a manner as to input a mechanical latch-releasing operation force to the latch mechanism 5.

[0017] The cylinder lock 11 includes: a cylinder body 14 formed into a cylindrical shape and having one end portion provided with a first flange portion 14a projecting outwardly in a radial direction; and a rotor 15 rotatably fitted into the cylinder body 14 in such a manner that a portion of the rotor 15 protrudes from the one end portion of the cylinder body 14. A key hole 16 (see FIG. 1) into which a mechanical key (unillustrated) is inserted is opened in a central portion of the end of the rotor 15 protruding from the one end portion of the cylinder body 14.

[0018] An opening 17 is provided in the outer panel 6 at a position next to the outer handle 7. A base plate 18 in a square shape is disposed in such a manner as to face the opening 17 from the inside of the outer panel 6.

[0019] Referring to FIG. 3 together, on a peripheral edge portion of the base plate 18, two supporting protrusions 18a, 18a and one locking protrusion 18b are provided at intervals in a peripheral direction. Weld nuts 19, 19 are fastened onto the supporting protrusions 18a ..., and an engaging hole 20 is provided in the locking protrusion 18b. Meanwhile, two supporting arm portions 6a ... are integrally provided to the outer panel 6 in such a manner as to extend inwardly from a peripheral edge of the opening 17. The supporting protrusions 18a ... are tightened on the supporting arm portions 6a ... with thread members 21 ... screwed in the weld nuts 19 .... An engaging portion (unillustrated) is integrally provided to the outer panel 6 in such a manner as to protrude from the peripheral edge of the opening 17 and engage with the engaging hole 20 of the locking protrusion 18b.

[0020] The cylinder lock 11 is attached to the outer panel 6 via the base plate 18. The other end portion of the cylinder body 14 of the cylinder lock 11 abuts against a substantially central portion of the base plate 18. Moreover, the cylinder body 14 is integrally provided with sup-

porting leg portions 14b, 14b ... in such a manner that the supporting leg portions 14b, 14b ... protrude from the other end portion of the cylinder body 14. The supporting leg portions 14b, 14b ... are respectively inserted through multiple insertion holes 24, 24 ... provided in the base plate 18. A stopper ring 25 is mounted on an outer surface of a portion of each of the supporting leg portions 14b, 14b ... protruding from the base plate 18. By engaging the stopper ring 25 with the base plate 18, the cylinder body 14 is fixed to the base plate 18.

[0021] Further, a cylindrical collar 26 coaxially surrounding the cylinder body 14 is sandwiched between the first flange portion 14a of the cylinder body 14 and the base plate 18. On an outer periphery of the collar 26 closer to one end portion thereof, a second flange portion 26a is integrally formed and projecting outwardly in the radial direction in such a manner as to face the first flange portion 14a. The second flange portion 26a forms an annular recessed section 27 in cooperation with the outer periphery of the one end portion of the collar 26 and the first flange portion 14a.

[0022] To the other end portion of the rotor 15, one end portion of a transmission shaft 28 is connected in a way to prohibit relative rotation. The other end portion of the transmission shaft 28 is connected to the latch mechanism 5 in such a manner as to transmit a mechanical operation force from the cylinder lock 11 for switching of a locked state and an unlocked state.

[0023] Paying attention to FIG. 3, the emergency operation member 12 is formed to integrally have: a first supporting plate portion 12a having a flat-plate shape along a plane perpendicular to a central axis of the cylinder lock 11 and arc-shaped to surround the one end portion of the cylinder body 14; and a knob portion 12b formed in an approximately U shape opened downward and protruding outwardly from an upper outer periphery of the first supporting plate portion 12a. An inner peripheral portion of the first supporting plate portion 12a is slidably fitted into the annular recessed section 27. In other words, the emergency operation member 12 is rotatably supported by the cylinder lock 11.

[0024] To the emergency operation member 12, a single relay member 13 is integrally connected, or is connected as a separate body and operates together. In this embodiment, the single relay member 13 is formed as a separate body from the emergency operation member 12 and is connected to the emergency operation member 12 and operates together.

[0025] The relay member 13 integrally has: a second supporting plate portion 13a having a flat-plate shape along a plane perpendicular to the central axis of the cylinder lock 11 and arc-shaped to surround the collar 26; and a connecting arm portion 13b extending downward from one end portion in a peripheral direction of the second supporting plate portion 13a. An inner peripheral portion of the second supporting plate portion 13a is slidingly in contact with an opposite surface of the second flange portion 26a of the collar 26 from the first flange portion 14a.

[0026] Meanwhile, a return spring 30 is interposed between the base plate 18 and the emergency operation member 12. The return spring 30 is a torsion coil spring having: a coil portion 30a surrounding the collar 26 between the second supporting plate portion 13a of the relay member 13 and the base plate 18; and a pair of engaging arm portions 30b, 30c extending from the respective ends of the coil portion 30a. The engaging arm portion 30b, one of the engaging arm portions, is engaged with an engaging hole 31 provided in the base plate 18; and, the engaging arm portion 30c, the other of the engaging arm portions, is engaged with a spring receiving protrusion 12c protruding from the outer periphery of the first supporting plate portion 12a of the emergency operation member 12.

[0027] Further, the emergency operation member 12 is biased and rotated in a clockwise direction in FIG. 3 by a spring force of the return spring 30. The second supporting plate portion 13a of the relay member 13 is pushed against the second flange portion 26a by a spring force of the return spring 30.

[0028] At a position of the base plate 18 partially overlapping an outer periphery of the second supporting plate portion 13a of the relay member 13, a restricting hole 32 is provided, which extends in an arc form with the central axis of the cylinder lock 11 as a center. On the outer periphery of the second supporting plate portion 13a, a restricting protrusion 13c is integrally provided in a protruding manner so as to be inserted into the restricting hole 32. The restricting protrusion 13c restricts a rotating end of the relay member 13 by abutting against opposite ends in a peripheral direction of the restricting hole 32.

[0029] Furthermore, opposite end portions in the peripheral direction of the second supporting plate portion 13a are respectively provided with abutting protrusions 13d, 13e, which face and are capable of abutting against opposite ends in a peripheral direction of the first supporting plate portion 12a of the emergency operation member 12. As the opposite ends in the peripheral direction of the first supporting plate portion 12a abut against these abutting protrusions 13d, 13e, a relative rotation of the emergency operation member 12 and the relay member 13 is restricted.

[0030] In a state where the restricting protrusion 13c abuts against a front end of the restricting hole 32 in a biased direction 33 of the emergency operation member 12 by the return spring 30 (the state shown in FIG. 3), the emergency operation member 12 is at a non-operated position. When the emergency operation member 12 is operated against a biasing force of the return spring 30 through an operation to push the knob portion 12b downward, the restricting protrusion 13c abuts against a rear end of the restricting hole 32 in the biased direction 33 of the emergency operation member 12 by the return spring 30 as shown in FIG. 4. In this manner, rotations of the emergency operation member 12 and the relay member 13 are restricted.

[0031] The connecting arm portion 13b of the relay member 13 extends to the latch mechanism 5. A tip end portion of the connecting arm portion 13b is directly connected to an input member 34 of the latch mechanism 5.

[0032] A resin-made cover member 35 for covering the opening 17 is detachably mounted on the outer panel 6 of the front side door D. The cover member 35 covers the cylinder lock 11 and the emergency operation member 12. Furthermore, the cover member 35 is provided with a through-hole 36 through which one end surface of the rotor 15 of the cylinder lock 11 is exposed so that the key hole 16 of the cylinder lock 11 is exposed to the outside.

[0033] The outer panel 6 is provided with an inwardly-extending flange portion 6b inwardly projecting from portions of the entire periphery of the opening 17 except for the supporting arm portions 6a ... and the aforementioned engaging portion protruding from the peripheral edge of the opening 17 in such a manner as to engage with the engaging hole 20 of the locking protrusion 18b. An outer peripheral portion of the cover member 35 is integrally provided with multiple elastic claws 35a ..., which elastically engage with the inwardly-extending flange portion 6b at multiple positions.

[0034] Next, operations of this embodiment will be described. The emergency operation member 12 that is capable of being operated from the outside of the front side door D in such a manner as to input a mechanical latch-releasing operation force to the latch mechanism 5 is assembled to the cylinder lock 11 attached to the front side door D in such a manner as to switch the unlocked state and the locked state of the latch mechanism 5 in accordance with an operation through the mechanical key. The single relay member 13 that is connected to the emergency operation member 12 and operates together is directly connected to the input member 34 of the latch mechanism 5. Accordingly, this enables a reduction in the number of components and eliminates the need for securing a large space within the front side door D. Thus, it is made possible to reduce the size of the front side door D and to improve the assembling workability.

[0035] Moreover, since the emergency operation member 12 is rotatably supported by the cylinder lock 11, a dedicated member for operably supporting the emergency operation member 12 is no longer necessary. A further reduction in the number of components is possible.

[0036] Further, the cover member 35 is detachably mounted on the outer panel 6 of the front side door D in such a manner that the key hole of the cylinder lock 11 is exposed to the outside. The cover member 35 covers the cylinder lock 11 and the emergency operation member 12. Accordingly, undesired operations on the emergency operation member 12 by mischief or the like can be suppressed.

[0037] Hereinabove, an embodiment of the present invention has been described. However, the present invention is not limited to the above embodiment, and various design modifications can be made without departing from the present invention described in the claims.

[0038] For example, in the above-described embodiment, the description has been given of the case where the emergency operation member 12 and the relay member 13 are formed as separate bodies. However, the emergency operation member 12 and the relay member 13 may be formed integrally.

[DESCRIPTION OF REFERENCE NUMERALS AND SYMBOLS]

[0039]

5	Latch mechanism
6	Outer panel
10	Electric motor, which is an electric actuator
11	Cylinder lock
12	Emergency operation member
13	Relay member
16	Key hole
34	Input member
35	Cover member
D	Front side door, which is a door

Claims

1. A latch releasing system for a vehicle door, comprising:

a latch mechanism (5) having an electric actuator (10) and being capable of switching between an unlocked state enabling latch releasing of a door (D) and a locked state disabling the latch releasing of the door (D), and capable of actuating the electric actuator (10) in the unlocked state and the latch releasing in accordance with a mechanical input of a latch-releasing operation force;

an emergency operation member (12) capable of being operated from outside of the door (D) in such a manner as to mechanically input the latch-releasing operation force to the latch mechanism (5); and

a cylinder lock (11) configured to switch the unlocked state and the locked state of the latch mechanism (5) in accordance with an operation through a mechanical key,

characterized in that

the emergency operation member (12) is assembled to the cylinder lock (11) attached to the door (D), and

a single relay member (13) is directly connected to an input member (34) of the latch mechanism (5), the single relay member (13) being integrally connected to the emergency operation member (12) or being connected thereto as a separate

body and operating together.

2. The latch releasing system for a vehicle door according to claim 1, wherein the emergency operation member (12) is rotatably supported by the cylinder lock (11).

3. The latch releasing system for a vehicle door according to claim 1 or 2, wherein
the cylinder lock (11) and the emergency operation member (12) are covered by a cover member (35) detachably mounted to an outer panel (6) of the door (D) in such a manner that a key hole (16) of the cylinder lock (11) is exposed to the outside.

FIG.1

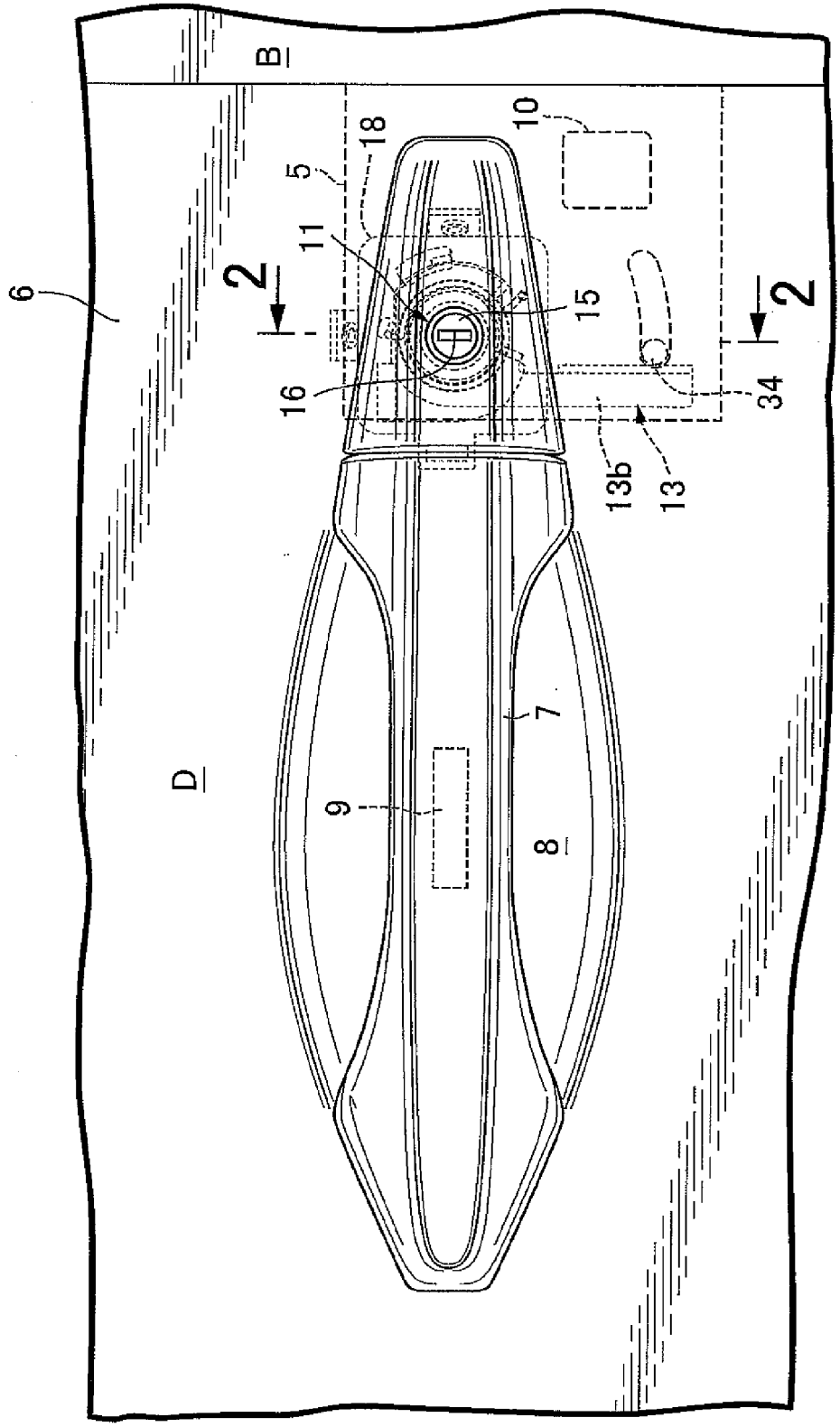

FIG.2

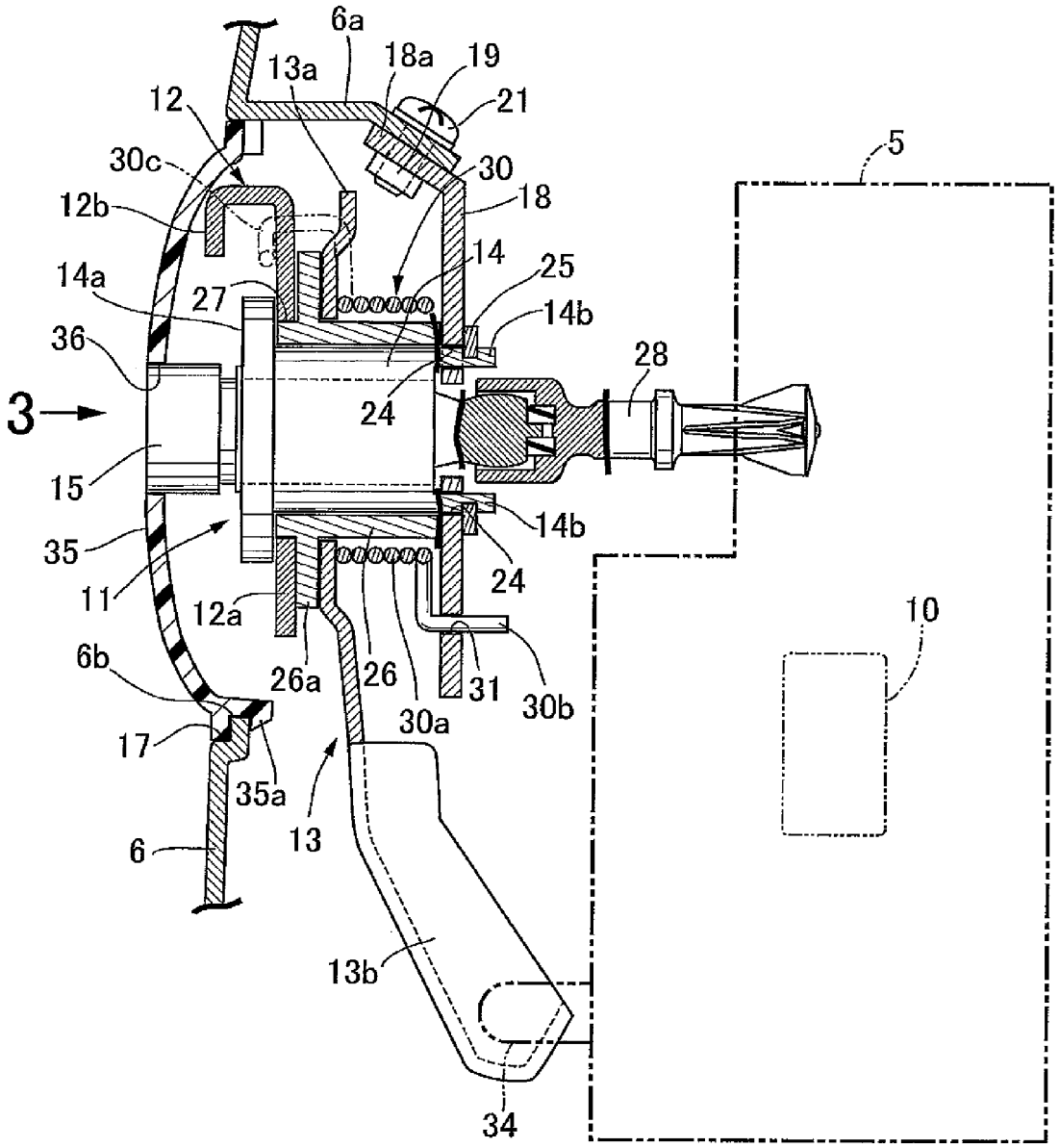
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FIG.3

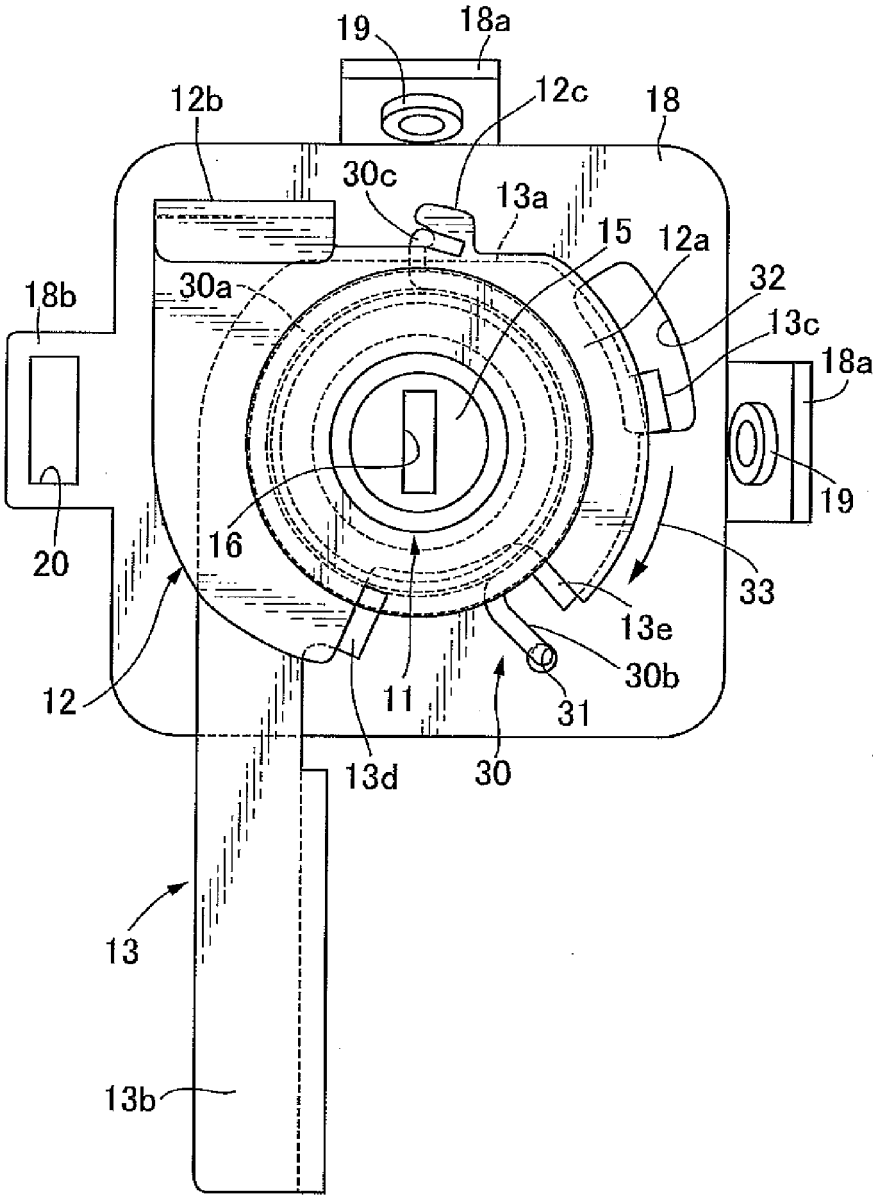
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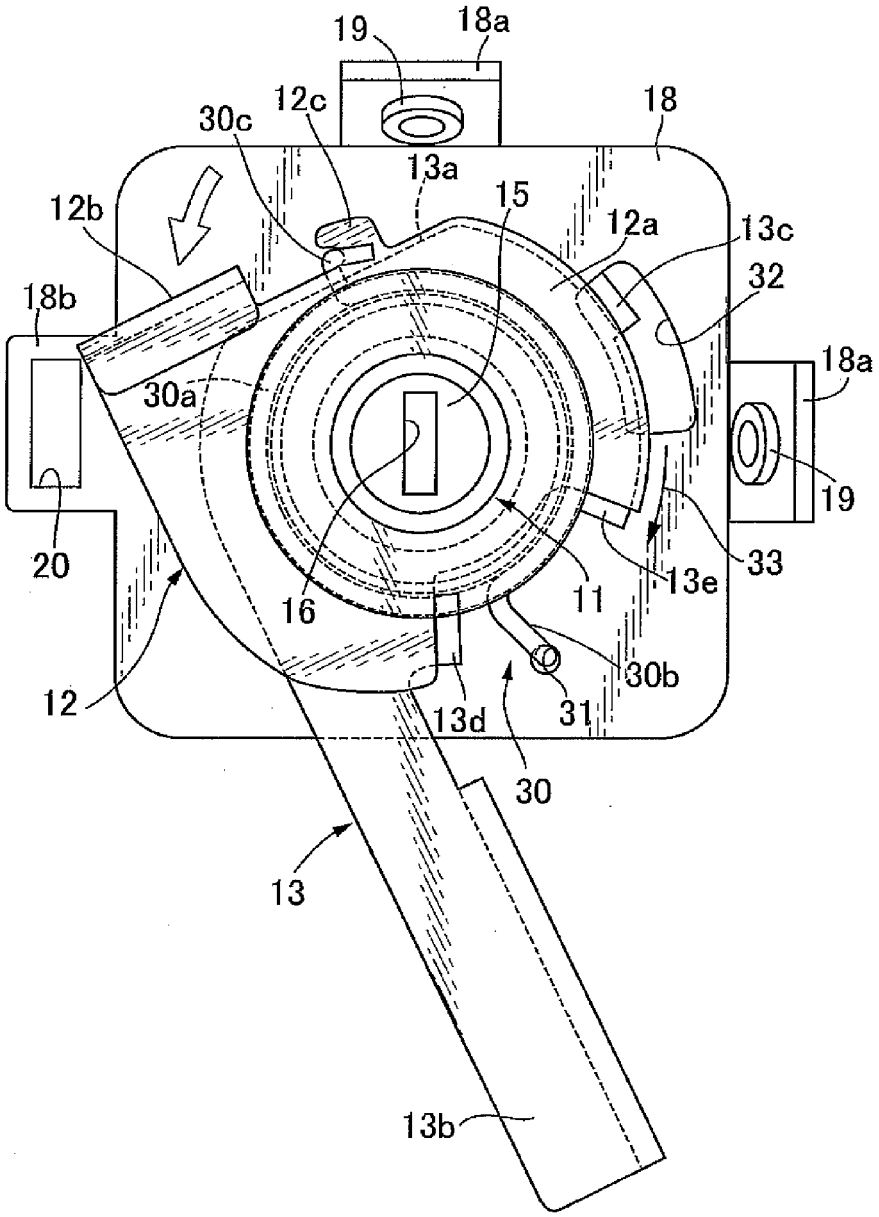
FIG.4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EUROPEAN SEARCH REPORT

Application Number
EP 12 19 9728

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A	US 7 827 836 B2 (CETNAR ROMAN [CA]) 9 November 2010 (2010-11-09) * the whole document * -----	1,2	
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A	EP 0 692 595 A1 (ROVER GROUP [GB]) 17 January 1996 (1996-01-17) * column 2, line 16 - line 30; figures 1-5 * -----	1	
			TECHNICAL FIELDS SEARCHED (IPC) E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 May 2013	Pérez Méndez, José F

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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