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(54) **VEHICLE HANDLE DEVICE, VEHICLE DOOR AND VEHICLE**

TÜRGRIFFVORRICHTUNG FÜR FAHRZEUG, TÜR UND FAHRZEUG

DISPOSITIF DE POIGNÉE DE VÉHICULE, PORTIÈRE DE VÉHICULE ET VÉHICULE

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Description

[0001] WO2019/133524A1 discloses a door handle apparatus according to the preamble of claim 1 and relates to a concealed handle assembly that includes a handle base and a handle body rotatable about a first axle such that one end of the handle body can extend or return to a concealed state, the first axle being disposed on the handle base, the handle body having a handle body initial position, a handle body first open position, and a handle body second open position. The assembly further includes a rocker arm rotatable about a second axle, the second axle being disposed on the handle base, the rocker arm having a rocker arm initial position, a rocker arm first open position, and a rocker arm second open position, the rocker arm being capable of being rotated away from or returned to the rocker arm initial position as the handle body rotates, the rocker arm being capable of driving a bolt.

[0002] Also EP3147436A1 discloses a door handle apparatus according to the preamble of claim 1 and relates to an outside handle device for a vehicle includes an outside handle being rotatably supported at a vehicle door between an initial position and an operation position, the operation position being a position in which a lock device being provided at the vehicle door is switched from a latched state to an unlatched state, a first actuator generating a drive force that rotates the outside handle to a grip position that corresponds to a position between the initial position and the operation position, a first switch being disposed at a portion of the outside handle, the portion disposed inwardly of the vehicle, the first switch operating the first actuator when being pressed, and a switch operation lever rotating when the outside handle rotates inwardly of the vehicle from the initial position and pressing the first switch.

Field of Invention

[0003] The present invention relates to the technical field of automotive vehicle, in particular, to a door handle apparatus for a vehicle, a door, and a vehicle.

Background

[0004] Generally, a door for a vehicle is equipped with a door handle, and the door can be opened through the door handle. In order to improve the aesthetics of the vehicle and reduce the resistance during travelling of the vehicle, in the related art, the door handle is provided in the outer surface of the door. For the structure of such a concealed door handle, how to conveniently open the door through the door handle has become the focus of attention.

Summary of Invention

[0005] The present invention provides a door handle

apparatus for a vehicle as set out in claim 1, comprising:

a support structure comprising a first side and a second side opposite to each other, wherein a housing recess is formed on the first side;

a door handle rotatably arranged on the support structure through a first rotation shaft, the door handle being rotatable between a first position and a second position, wherein in the first position, the door handle is received in the housing recess, and in the second position, a first end of the door handle is outside the housing recess;

a switch element arranged on the support structure; and

a transmission member rotatably arranged on the support structure through a second rotation shaft and located on the second side, wherein the transmission member is connected to a second end of the door handle, when the door handle is rotated from the first position to the second position, the door handle drives the transmission member to move, and when the door handle is in the second position, the transmission member abuts the switch element, and the switch element generates an electric signal for controlling unlocking of a door, wherein the door handle is operable to drive the transmission member to rotate;

characterized by an elastic member arranged on the support structure, wherein the elastic member is spaced apart from the switch element, the door handle is movable from the second position to a third position, and the second position is between the first position and the third position, and wherein during rotation of the

door handle from the second position to the third position, the transmission member rotates and remains in contact with the switch element, and when the door handle is in the third position, the transmission member elastically abuts the elastic member, so that the elastic member can act as a soft limiting structure to the transmission member, and form feedback to door handle.

[0006] Further provided is a door as set out in claim 12, and a vehicle as set out in claim 13. Other embodiments of the invention are set out in the further dependent claims.

[0007] In the aforementioned door handle apparatus for a vehicle, the door, and the vehicle, when the door handle is rotated to the second position outside the housing recess, the door handle can cause, through the transmission member, the switch element to generate an electric signal for controlling the unlocking of the door. With such simple operations, the door can be opened conveniently by electric means.

[0008] The additional aspects and advantages of the present invention will be described below.

Brief Description of Drawings

[0009] The aforementioned and/or additional aspects and advantages of the present invention will become more apparent and easier to understand from the description of the embodiments with reference to the drawings, in which:

FIG. 1 is a schematic diagram of a vehicle according to an embodiment of the present invention;
 FIG. 2 is a schematic perspective view of a door handle apparatus for a vehicle according to an embodiment of the present invention;
 FIG. 3 is a schematic exploded view of a door handle apparatus for a vehicle according to an embodiment of the present invention;
 FIG. 4 is another schematic exploded view of a door handle apparatus for a vehicle according to an embodiment of the present invention;
 FIG. 5 is a schematic structural diagram of a door handle apparatus for a vehicle when the door handle is at the first position according to an embodiment of the present invention;
 FIG. 6 is a schematic structural diagram of the door handle apparatus for a vehicle when the door handle is at the second position according to an embodiment of the present invention;
 FIG. 7 is a schematic diagram from another perspective of the door handle apparatus for a vehicle when the door handle is at the second position according to an embodiment of the present invention;
 FIG. 8 is a schematic diagram showing part of the door handle apparatus for a vehicle when the door handle is at the third position according to an embodiment of the present invention;
 FIG. 9 is a schematic structural diagram of the door handle apparatus for a vehicle when the door handle is at the fourth position according to an embodiment of the present invention; and
 FIG. 10 is a schematic cross-sectional diagram of a door handle apparatus for a vehicle of FIG. 9 along A-A.

Reference signs:

[0010]

door handle apparatus 100 for a vehicle,
 support structure 10,
 first side 11,
 second side 12,
 housing recess 13,
 first rotation shaft 14,
 limiting structure 15,
 first protrusion 151,
 keyhole 16
 door handle 20,
 first end 21,

second end 22,
 main body 23,
 handle cover 24,
 second protrusion 25,
 switch element 30,
 transmission member 40,
 second rotation shaft 41,
 arc rack 42,
 pushing part 50,
 elastic member 60,
 abutting member 61,
 first elastic member 62,
 third rotation shaft 63,
 gear 70,
 second elastic member 80,
 vehicle 200,
 body frame 210,
 door 300,
 door body 310.

Detailed Description

[0011] Embodiments of the present invention are described in detail below. Examples of the embodiments are shown in the drawings, wherein same or similar reference signs indicate same or similar components or components with same or similar functions throughout. The embodiments described below with reference to the drawings are exemplary, and are intended to explain the present invention, and cannot be construed as limiting the present invention.

[0012] The following disclosure provides different embodiments or examples for implementing different structures of the present invention. In order to simplify the disclosure of the present invention, the components and arrangements of specific examples are described below. Of course, they are only illustrative and are not intended to limit the present invention. In addition, same reference signs and/or reference letters may be used herein in different examples. Such usage is for the purpose of simplification and clarity, and does not indicate the relationship between the various embodiments and/or arrangements discussed. In addition, the present invention provides examples of various specific processes and materials, but those of ordinary skills in the art may be aware of the application of other processes and/or the use of other materials.

[0013] Referring to FIG. 1, which illustrates a door handle apparatus 100 for a vehicle according to an embodiment of the present invention. Door handle apparatus 100 for a vehicle may be applicable to door 300 of vehicle 200. In other words, door 300 includes door handle apparatus 100 for a vehicle. Door handle apparatus 100 for a vehicle is used to lock or unlock door 300. When door 300 is locked, door 300 cannot be opened; when door 300 is unlocked, door 300 can be opened.

[0014] In an embodiment of the present invention, door handle apparatus 100 for a vehicle includes support

structure 10, door handle 20, a switch element 30 and transmission member 40. Support structure 10 includes first side 11 and second side 12 opposite to each other, and housing recess 13 is formed on first side 11. Door handle 20 is rotatably arranged on support structure 10 through first rotation shaft 14. Door handle 20 can be rotated between a first position and a second position. In the first position, door handle 20 is received in housing recess 13, and in the second position, first end 21 of door handle 20 is outside housing recess 13.

[0015] Switch element 30 is arranged on support structure 10. Transmission member 40 is movably arranged on support structure 10 and located on second side 12. Transmission member 40 is connected to second end 22 of door handle 20. When door handle 20 is rotated from the first position to the second position, door handle 20 drives transmission member 40 to move. When door handle 20 is in the second position, transmission member 40 abuts the switch element 30, and switch element 30 generates an electric signal for controlling the unlocking of door 300.

[0016] In the aforementioned door handle apparatus 100 for a vehicle, door 300, and vehicle 200, when door handle 20 is rotated to the second position outside housing recess 13, door handle 20 can cause, through transmission member 40, switch element 30 to generate an electric signal for controlling the unlocking of door 300. Such simple operations enables door 300 to be opened in an electric manner more conveniently.

[0017] Specifically, support structure 10 is a carrier of door handle apparatus 100 for a vehicle, and support structure 10 may be used to carry other components of door handle apparatus 100 for a vehicle. Support structure 10 may have a plate shape, an irregular shape, or the like, and the specific shape of support structure 10 is not limited herein. In an embodiment of the present invention, in order to make support structure 10 easy to carry other components, support structure 10 has an irregular shape. Support structure 10 can be made of plastic, metal or other materials. For example, when support structure 10 is made of plastic, support structure 10 can be formed by an injection molding process.

[0018] In an embodiment of the present invention, first side 11 and second side 12 of support structure 10 respectively extend along the thickness direction of support structure 10. In other words, first side 11 and second side 12 of support structure 10 are respectively located on opposite sides of support structure 10 in the thickness direction. Housing recess 13 is a recessed part on support structure 10, and the volume of housing recess 13 is adapted to the volume of door handle 20 so that door handle 20 can be received in housing recess 13. In addition, the shape of housing recess 13 is adapted to the shape of door handle 20, allowing a more compact matching of housing recess 13 and door handle 20. For example, door handle 20 may have an oval shape as a whole, and housing recess 13 may also have an oval shape.

[0019] Door handle 20 is an operating component of door handle apparatus 100 for a vehicle, and users can open door 300 of vehicle 200 by operating door handle 20. Along the length of door handle 20, door handle 20 includes first end 21 and second end 22, and first rotation shaft 14 is provided between and passes through first end 21 and second end 22. In an embodiment of the present invention, first rotation shaft 14 is arranged closer to second end 22 than first end 21.

[0020] First rotation shaft 14 is located in housing recess 13, and first rotation shaft 14 and support structure 10 may be separately formed structures. First rotation shaft 14 can be detachably mounted on support structure 10. In an example, when assembling door handle apparatus 100 for a vehicle, door handle 20 can be placed in housing recess 13 first, and then first rotation shaft 14 is inserted into support structure 10 and door handle 20 in sequence, to complete the installation of door handle 20.

[0021] It can be understood that during the rotation of door handle 20 from the first position to the second position, first end 21 of door handle 20 turns out of housing recess 13, and second end 22 of door handle 20 turns into housing recess 13.

[0022] In an embodiment of the present invention, door handle 20 includes main body 23 and handle cover 24 covering and arranged on the main body 23, as shown in FIG. 2 and FIG. 3. Main body 23 is rotatably arranged on first rotation shaft 14. Handle cover 24 is an exterior part of door handle 20. Handle cover 24 can be formed with a smooth outer surface by paint spraying or other processes, so that door handle 20 is more artistic.

[0023] Switch element 30 is an electrical component, and switch element 30 can generate an electric signal when it is touched or approached. Switch element 30 may be a micro switch, a proximity sensor, or other components. Switch element 30 can be installed on support structure 10 by means of screws, buckles, or the like. Switch element 30 is located on second side 12 of support structure 10, so that the spaces on support structure 10 can be fully utilized to prevent switch element 30 from interfering with door handle 20, making door handle apparatus 100 for a vehicle more compact.

[0024] Transmission member 40 is a force transmitting component of door handle apparatus 100 for a vehicle, and transmission member 40 can transmit the force from door handle 20 to switch element 30. Transmission member 40 is located on second side 12 of support structure 10 so as to prevent transmission member 40 from interfering with door handle 20. Transmission member 40 can be made of plastic or other materials. The structure and shape of transmission member 40 are not specifically limited. In an embodiment of the present invention, transmission member 40 has an irregular shape.

[0025] Referring to FIG. 5, FIG. 5 shows the position of transmission member 40 when door handle 20 is in the first position. As shown in FIG. 5, when door handle 20 is in the first position, transmission member 40 is spaced apart from switch element 30, and at this point,

switch element 30 is not triggered. Referring to FIG. 6 and FIG. 7, when door handle 20 is in the second position, transmission member 40 abuts switch element 30, and at this point, switch element 30 is triggered to generate an electric signal. The electric signal generated by switch element 30 can be transmitted to a controller of vehicle 200, and the controller can control corresponding electric component to unlock door 300 in an electric manner, so that door 300 can be opened when unlocked.

[0026] In some embodiments, when door handle 20 is rotated from the first position to the second position, the angular distance that door handle 20 travels is within the range of 7°-13°. In other words, door handle 20 reaches the second position after rotating 7°-13° from the first position. For example, when door handle 20 is rotated from the first position to the second position, the angle that door handle 20 has rotated may be 7°, 8.5°, 9°, 10°, 12.5°, or 13°.

[0027] It can be understood that, in the second position, since transmission member 40 abuts switch element 30, switch element 30 can form a reaction force on transmission member 40, and the force can be transmitted to door handle 20. Therefore, when users operate door handle 20, they can perceive that switch element 30 is triggered.

[0028] Referring to FIG. 3 and FIG. 5, in some embodiments, door handle apparatus 100 for a vehicle includes pushing member 50, and pushing member 50 connects second end 22 of door handle 20 to transmission member 40. Pushing member 50 passes through support structure 10. Door handle 20 drives transmission member 40 to move through pushing member 50.

[0029] In this way, pushing member 50 facilitates door handle 20 to drive transmission member 40 to move. Specifically, pushing member 50 has a long strip shape. Pushing member 50 and main body 23 of door handle 20 may be in an integral structure, in other words, pushing member 50 and main body 23 of door handle 20 cannot be detached. Pushing member 50 abuts transmission member 40, so that transmission member 40 can be pushed to move.

[0030] Referring to FIG. 4, in some embodiments, transmission member 40 is rotatably arranged on support structure 10 through second rotation shaft 41, and door handle 20 is operable to drive transmission member 40 to rotate. In this way, transmission member 40 can be arranged on support structure 10 in a rotating manner, so that the movement mode of transmission member 40 is easier to control.

[0031] Specifically, second rotation shaft 41 and support structure 10 may be in an integral structure. The axial direction of second rotation shaft 41 is the same as the thickness direction of support structure 10. Second rotation shaft 41 and pushing member 50 are arranged at a predefined distance from each other, so that transmission member 40 can form a rotational torque, and thus pushing member 50 can push transmission member 40 to rotate during the movement.

[0032] Referring to FIG. 4, in some embodiments, door handle apparatus 100 for a vehicle includes elastic member 60 arranged on support structure 10, and elastic member 60 is spaced apart from switch element 30. Door handle 20 can move from the second position to a third position, and the second position is between the first position and the third position. During the rotation of door handle 20 from the second position to the third position, transmission member 40 rotates and remains in contact with switch element 30. When door handle 20 is in the third position, transmission member 40 elastically abuts elastic member 60.

[0033] In other words, during the rotation of door handle 20, it can rotate from the first position to the second position and the third position in sequence. The rotation angle of door handle 20 from the first position to the second position is smaller than the rotation angle of the door handle from the first position to the third position.

[0034] As shown in FIG. 8, when door handle 20 is in the third position, transmission member 40 elastically abuts elastic member 60, so that elastic member 60 can act as a soft limiting structure to transmission member 40, and elastic member 60 can form feedback to door handle 20 through transmission member 40, reminding users that switch element 30 has been triggered and door 300 is unlocked during the rotation of door handle 20, so as to facilitate users to unlock door 300 with door handle 20.

[0035] As shown in FIG. 4, in some embodiments, elastic member 60 includes abutting member 61 and first elastic member 62. Abutting member 61 is rotatably arranged on support structure 10 through third rotation shaft 63. First elastic member 62 is connected to abutting member 61. When door handle 20 is in the third position, transmission member 40 abuts abutting member 61, and first elastic member 62 applies a first restoring force to abutting member 61.

[0036] In this way, first elastic member 62 can transmit feedback to door handle 20 through abutting member 61 and transmission member 40, and can make abutting member 61 restore to the initial position after being rotated. Specifically, abutting member 61 may have an irregular shape. Abutting member 61 is sheathed on third rotation shaft 63 so that abutting member 61 can rotate relative to support structure 10. Abutting member 61 and switch element 30 contact transmission member 40 respectively at different parts.

[0037] First elastic member 62 can be a spring, an elastic block, or other elastic member. In an embodiment of the present invention, first elastic member 62 is a torsion spring, and the torsion spring is sheathed on the third rotation shaft 63. The torsion spring can provide abutting member 61 with the first restoring force, so that abutting member 61 can restore to the initial position.

[0038] In some embodiments, when door handle 20 is rotated from the first position to the third position, the angular distance that the door handle 20 travels is within the range of 14°-16°. In other words, after door handle

20 is rotated for an angle range of 14°-16°, transmission member 40 abuts elastic member 60. The rotation angle of door handle 20 is appropriate and is convenient for users to operate. In an example, when door handle 20 is rotated from the first position to the third position, the angle that door handle 20 has rotated may be 14°, 15°, or 16°.

[0039] Referring to FIG. 9 and FIG. 10, in some embodiments, limiting structure 15 is provided in housing recess 13. Door handle 20 can move from the third position to a fourth position, and the third position is between the second position and the fourth position. During the rotation of door handle 20 from the third position to the fourth position, transmission member 40 rotates and remains in contact with elastic member 60. When door handle 20 is in the fourth position, second end 22 of door handle 20 abuts limiting structure 15.

[0040] In this way, when door handle 20 is located at the fourth position, limiting structure 15 can limit door handle 20 from continuing to rotate, so as to limit door handle 20 from overly rotating, which is convenient for users to use. Specifically, limiting structure 15 is first protrusion 151 formed in housing recess 13, and second end 22 of door handle 20 may form second protrusion 25. First protrusion 151 abuts second protrusion 25, so that door handle 20 can be limited from continuing to rotate. The surface on which second protrusion 25 abuts first protrusion 151 may be an inclined surface.

[0041] In some embodiments, when the door handle is rotated from the first position to the fourth position, an angular distance that the door handle travels is within the range of 20°-24°. In other words, after door handle 20 is rotated for an angle in the range of 20°-24°, limiting structure 15 abuts second end 22 of door handle 20. The rotation angle of door handle 20 is appropriate and is convenient for users to operate. In an example, when door handle 20 is rotated from the first position to the fourth position, the angle door handle 20 has rotated may be 20°, 21°, 22°, or 24°.

[0042] Referring to FIG. 4 and FIG. 9, in some embodiments, transmission member 40 forms arc rack 42 concentrically arranged with second rotation shaft 41. Door handle apparatus 100 for a vehicle includes gear 70 rotatably arranged on support structure 10, and gear 70 meshes with arc rack 42.

[0043] In this way, transmission member 40 meshes with gear 70 through arc rack 42 so that the rotation of transmission member 40 can be more stable. Specifically, gear 70 is spaced apart from switch element 30 and abutting member 61. Abutting member 61 is located between switch element 30 and gear 70, so that the components of door handle apparatus 100 for a vehicle are reasonably arranged in place, such that door handle apparatus 100 for a vehicle is more compact.

[0044] Referring to FIG. 4, in some embodiments, door handle apparatus 100 for a vehicle further includes second elastic member 80 connecting support structure 10 and transmission member 40, and second elastic mem-

ber 62 is used to apply a second restoring force to transmission member 40. The second restoring force enables transmission member 40 to move to restore door handle 20 to the first position.

[0045] In this way, door handle 20 can be restored into housing recess 13 after being rotated, which is convenient for users to use. Specifically, second elastic member 80 can be a spring, an elastic block, or other elastic members. In an embodiment of the present invention, second elastic member 80 is a torsion spring, and the torsion spring is sheathed on second rotation shaft 41. The torsion spring can provide transmission member 40 with a second restoring force, so that transmission member 40 can restore to the initial position, driving door handle 20 to restore to the first position and be received in housing recess 13.

[0046] Referring to FIG. 10, in some embodiments, the bottom surface of housing recess 13 is provided with keyhole 16, and keyhole 16 is arranged associated with first end 21 of door handle 20. In this way, keyhole 16 can allow key 102 to insert into door 300 to unlock door 300 in a mechanical manner. As discussed above, when door handle 20 is in the fourth position, the angle of door handle 20 has rotated is the largest, and meanwhile the distance between first end 21 and housing recess 13 is relatively longer, so that key 102 can be inserted into keyhole 16.

[0047] Referring to FIG. 1 again, according to an embodiment of the present invention, door 300 further includes door body 310. Door handle apparatus 100 for a vehicle is provided on door body 310. The outer surface of door handle 20 is flush with the outer surface of door body 310, or the outer surface of door handle 20 is recessed on the outer surface of door body 310. In this way, door handle 20 can be concealed in door 300, which not only improves the aesthetics of door 300, but also reduces the resistance of vehicle 200 during travel.

[0048] According to an embodiment of the present invention, vehicle 200 includes body frame 210 and door 300, and door 300 is provided on body frame 210. In this way, door handle apparatus 100 for a vehicle can make the unlocking of door 300 of vehicle 200 more convenient, which helps to improve the user experience.

[0049] In the description herein, the terms "some embodiments", "one embodiment", "some implementations", "exemplary embodiments", "examples", "specific examples", or "some examples" etc. mean that the specific characteristics, structures, materials, or features described for the embodiments or examples are included in at least one embodiment or example of the present invention. In this disclosure, the illustrative description of the aforementioned terms does not necessarily refer to the same embodiment or example. Moreover, the described specific characteristics, structures, materials, or features can be combined in any one or more embodiments or examples in a suitable manner.

[0050] In addition, terms "first", "second", etc. are only used for illustration purposes, and cannot be construed

as indicating or implying relative importance or implicitly indicating the number of indicated technical characteristics. Therefore, the features defined with "first" and "second" may explicitly or implicitly include at least one of such features. In the description of the present invention, "multiple" means at least two, such as two, three, etc., unless otherwise specifically defined.

[0051] Although the embodiments of the present invention are shown and described, it can be understood that the aforementioned embodiments are exemplary and cannot be understood to limit the present invention. Those of ordinary skills in the art can make changes, modifications, substitutions and variations to the aforementioned embodiments within the scope of the present invention as defined by the claims.

Claims

1. A door handle apparatus (100) for a vehicle, comprising:

a support structure (10) comprising a first side (11) and a second side (12) opposite to each other, wherein a housing recess (13) is formed on the first side;

a door handle (20) rotatably arranged on the support structure (10) through a first rotation shaft (14), the door handle (20) being rotatable between a first position and a second position, wherein in the first position, the door handle (20) is received in the housing recess (13), and in the second position, a first end (21) of the door handle (20) is outside the housing recess (13); a switch element (30) arranged on the support structure (10); and

a transmission member (40) rotatably arranged on the support structure (10) through a second rotation shaft (41) and located on the second side (12), wherein the transmission member (40) is connected to a second end (22) of the door handle (20), when the door handle (20) is rotated from the first position to the second position, the door handle (20) drives the transmission member (40) to move, and when the door handle (20) is in the second position, the transmission member (40) abuts the switch element (30), and the switch element (30) generates an electric signal for controlling unlocking of a door, wherein the door handle (20) is operable to drive the transmission member (40) to rotate;

characterized by

an elastic member (60) arranged on the support structure (10), wherein the elastic member (60) is spaced apart from the switch element, the door handle (20) is movable from the second position to a third position, and the second position is between the first position and the third

position, and wherein during rotation of the door handle (20) from the second position to the third position, the transmission member (40) rotates and remains in contact with the switch element (30), and when the door handle (20) is in the third position, the transmission member elastically abuts the elastic member (60), so that the elastic member (60) can act as a soft limiting structure to the transmission member (40), and form feedback to door handle (20).

2. The door handle apparatus (100) for a vehicle of claim 1, wherein when the door handle (20) is rotated from the first position to the second position, an angular distance that the door handle (20) travels is within the range of 7°-13°.

3. The door handle apparatus (100) for a vehicle of claim 1, comprising a pushing member (50) connecting the second end (22) of the door handle (20) and the transmission member (40), wherein the pushing member (50) passes through the support structure (10), and the door handle (20) is operable to drive the transmission member (40) to move via the pushing member (50).

4. The door handle apparatus (100) for a vehicle of claim 1, wherein the elastic member (60) comprises an abutting member (61) and a first elastic member (62), the abutting member (61) is rotatably arranged on the support structure (10) through a third rotation shaft (63), the first elastic member (62) is connected to the abutting member (61), when the door handle (10) is in the third position, the transmission member (40) abuts the abutting member (61), and the first elastic member (62) applies a first restoring force to the abutting member (61).

5. The door handle apparatus (100) for a vehicle of claim 1, wherein when the door handle (20) is rotated from the first position to the third position, an angular distance that the door handle (20) travels is within the range of 14°-16°.

6. The door handle apparatus (100) for a vehicle of claim 4, wherein a limiting structure (15) is provided in the housing recess (13), the door handle (20) is movable from the third position to a fourth position, the third position is between the second position and the fourth position, and wherein during the rotation of the door handle (20) from the third position to the fourth position, the transmission member (40) rotates and remains in contact with the elastic member (60), and when the door handle (20) is in the fourth position, the second end (22) of door handle (20) abuts the limiting structure (15).

7. The door handle apparatus (100) for a vehicle of

claim 6, wherein when the door handle (20) is rotated from the first position to the fourth position, an angular distance that the door handle (20) travels is within the range of 20°-24°.

8. The door handle apparatus (100) for a vehicle of claim 1, wherein the transmission member (40) forms an arc rack (42) concentrically arranged with the second rotation shaft (41), the door handle apparatus (100) comprises a gear (70) rotatably arranged on the support structure (10), and the gear (70) meshes with the arc rack (42). 5
9. The door handle apparatus (100) for a vehicle of claim 1, further comprising a second elastic member (80) connecting the support structure (10) and the transmission member (40), wherein the second elastic member (80) is operable to apply a second restoring force to the transmission member (40), and the second restoring force enables the transmission member (40) to move to restore the door handle (20) to the first position. 10
10. The door handle apparatus (100) for a vehicle of claim 1, wherein a bottom surface of the housing recess (13) is provided with a keyhole (16), and the keyhole (16) is aligned with the first end (21) of the door handle (20). 15
11. The door handle apparatus (100) for a vehicle of claim 4, wherein the abutting member (61) and the switch element (30) contact transmission member (40) respectively at different parts. 20
12. A door (300) of a vehicle, comprising: 25
 - a door body (310); and
 - a door handle apparatus (100) for a vehicle of any one of claims 1-11, wherein the door handle apparatus (100) is provided on the door body (310), and an outer surface of the door handle (20) is flush with an outer surface of the door body (310), or the outer surface of the door handle (20) is recessed on the outer surface of the door body (310). 30
13. A vehicle, comprising: 35
 - a vehicle frame, and
 - a door of claim 12, the door arranged on the vehicle frame. 40

Patentansprüche

1. Türgriffvorrichtung (100) für ein Fahrzeug, umfassend: 45

eine Haltestruktur (10), umfassend eine erste Seite (11) und eine zweite Seite (12), die einander gegenüberliegen, wobei auf der ersten Seite eine Gehäuseaussparung (13) gebildet ist; einen Türgriff (20), der über eine erste Drehachse (14) drehbar an der Haltestruktur (10) angeordnet ist, wobei der Türgriff (20) zwischen einer ersten Stellung und einer zweiten Stellung drehbar ist, wobei in der ersten Stellung der Türgriff (20) in der Gehäuseaussparung (13) aufgenommen ist und sich in der zweiten Stellung ein erstes Ende (21) des Türgriffs (20) außerhalb der Gehäuseaussparung (13) befindet; ein Schalterelement (30), das an der Haltestruktur (10) angeordnet ist; und ein Übertragungselement (40), das über eine zweite Drehachse (41) drehbar an der Haltestruktur (10) angeordnet ist und sich auf der zweiten Seite (12) befindet, wobei das Übertragungselement (40) mit einem zweiten Ende (22) des Türgriffs (20) verbunden ist, wobei, wenn der Türgriff (20) aus der ersten Stellung in die zweite Stellung gedreht wird, der Türgriff (20) das Übertragungselement (40) zur Bewegung antreibt und, wenn sich der Türgriff (20) in der zweiten Stellung befindet, das Übertragungselement (40) an dem Schalterelement (30) anstößt und das Schalterelement (30) ein elektrisches Signal zum Steuern des Entriegelns einer Tür erzeugt, wobei der Türgriff (20) wirksam ist, um das Übertragungselement (40) zur Drehung anzutreiben; **gekennzeichnet durch** ein elastische Element (60), das an der Haltestruktur (10) angeordnet ist, wobei das elastische Element (60) von dem Schalterelement beabstandet ist, der Türgriff (20) aus der zweiten Stellung in eine dritte Stellung bewegbar ist und sich die zweite Stellung zwischen der ersten Stellung und der dritten Stellung befindet, und wobei sich das Übertragungselement (40) während der Drehung des Türgriffs (20) aus der zweiten Stellung in die dritte Stellung dreht und mit dem Schalterelement (30) in Kontakt verbleibt und wenn sich der Türgriff (20) in der dritten Stellung befindet, das Übertragungselement an dem elastischen Element (60) elastisch anstößt, sodass das elastische Element (60) als weiche Anschlagstruktur für das Übertragungselement (40) wirken kann und eine Rückmeldung für den Türgriff (20) bilden kann.

2. Türgriffvorrichtung (100) für ein Fahrzeug nach Anspruch 1, wobei, wenn der Türgriff (20) aus der ersten Stellung in die zweite Stellung gedreht wird, eine Winkeldistanz, die der Türgriff (20) zurücklegt, im Bereich von 7°-13° liegt. 50

3. Türgriffvorrichtung (100) für ein Fahrzeug nach Anspruch 1, umfassend ein Druckelement (50), das das zweite Ende (22) des Türgriffs (20) und das Übertragungselement (40) verbindet, wobei das Druckelement (50) durch die Haltestruktur (10) verläuft und der Türgriff (20) wirksam ist, um das Übertragungselement (40) mittels des Druckelements (50) zur Bewegung anzutreiben.
4. Türgriffvorrichtung (100) für ein Fahrzeug nach Anspruch 1, wobei das elastische Element (60) ein Anstoßelement (61) und ein erstes elastisches Element (62) umfasst, wobei das Anstoßelement (61) über eine dritte Drehachse (63) drehbar an der Haltestruktur (10) angeordnet ist, wobei das erste elastische Element (62) mit dem Anstoßelement (61) verbunden ist, wobei, wenn sich der Türgriff (10) in der dritten Stellung befindet, das Übertragungselement (40) an dem Anstoßelement (61) anstößt und das erste elastische Element (62) eine erste Rückstellkraft auf das Anstoßelement (61) ausübt.
5. Türgriffvorrichtung (100) für ein Fahrzeug nach Anspruch 1, wobei, wenn der Türgriff (20) aus der ersten Stellung in die dritte Stellung gedreht wird, eine Winkeldistanz, die der Türgriff (20) zurücklegt, im Bereich von 14°-16° liegt.
6. Türgriffvorrichtung (100) für ein Fahrzeug nach Anspruch 4, wobei in der Gehäuseaussparung (13) eine Anschlagstruktur (15) bereitgestellt ist, der Türgriff (20) aus der dritten Stellung in eine vierte Stellung bewegbar ist, sich die dritte Stellung zwischen der zweiten Stellung und der vierten Stellung befindet, und wobei sich während der Drehung des Türgriffs (20) aus der dritten Stellung in die vierte Stellung das Übertragungselement (40) dreht und in Kontakt mit dem elastischen Element (60) verbleibt, und wenn sich der Türgriff (20) in der vierten Stellung befindet, das zweite Ende (22) des Türgriffs (20) an der Anschlagstruktur (15) anstößt.
7. Türgriffvorrichtung (100) für ein Fahrzeug nach Anspruch 6, wobei, wenn der Türgriff (20) aus der ersten Stellung in die vierte Stellung gedreht wird, eine Winkeldistanz, die der Türgriff (20) zurücklegt, im Bereich von 20°-24° liegt.
8. Türgriffvorrichtung (100) für ein Fahrzeug nach Anspruch 1, wobei das Übertragungselement (40) eine gebogene Zahnstange (42) bildet, die mit der zweiten Drehachse (41) konzentrisch angeordnet ist, die Türgriffvorrichtung (100) ein Zahnrad (70) umfasst, das drehbar an der Haltestruktur (10) angeordnet ist, und das Zahnrad (70) mit der gebogenen Zahnstange (42) verzahnt ist.
9. Türgriffvorrichtung (100) für ein Fahrzeug nach Anspruch 1, ferner umfassend ein zweites elastisches Element (80), das die Haltestruktur (10) und das Übertragungselement (40) verbindet, wobei das zweite elastische Element (80) wirksam ist, um eine zweite Rückstellkraft auf das Übertragungselement (40) auszuüben, und die zweite Rückstellkraft ermöglicht, dass sich das Übertragungselement (40) bewegt, um den Türgriff (20) in die erste Stellung zurückzustellen.
10. Türgriffvorrichtung (100) für ein Fahrzeug nach Anspruch 1, wobei eine Bodenfläche der Gehäuseaussparung (13) mit einem Schlüsselloch (16) versehen ist und das Schlüsselloch (16) auf das erste Ende (21) des Türgriffs (20) ausgerichtet ist.
11. Türgriffvorrichtung (100) für ein Fahrzeug nach Anspruch 4, wobei das Anstoßelement (61) und das Schalterelement (30) das Übertragungselement (40) jeweils an verschiedenen Teilen kontaktieren.
12. Tür (300) eines Fahrzeugs, umfassend:
einen Türkörper (310); und
eine Türgriffvorrichtung (100) für ein Fahrzeug nach einem der Ansprüche 1-11, wobei die Türgriffvorrichtung (100) an dem Türkörper (310) bereitgestellt ist und eine Außenoberfläche des Türgriffs (20) mit einer Außenoberfläche des Türkörpers (310) bündig ist oder die Außenoberfläche des Türgriffs (20) auf der Außenoberfläche des Türkörpers (310) zurückgesetzt ist.
13. Fahrzeug, umfassend:
einen Fahrzeugrahmen; und
eine Tür nach Anspruch 12, wobei die Tür an dem Fahrzeugrahmen angeordnet ist.

Revendications

1. Appareil formant poignée de porte (100) pour un véhicule, comportant :
- une structure de support (10) comportant un premier côté (11) et un deuxième côté (12) opposés l'un par rapport à l'autre, dans lequel un renforcement de boîtier (13) est formé sur le premier côté ;
- une poignée de porte (20) agencée de manière rotative sur la structure de support (10) par un premier arbre de rotation (14), la poignée de porte (20) étant rotative entre une première position et une deuxième position, dans lequel, dans la première position, la poignée de porte (20) est reçue dans le renforcement de boîtier (13), et dans la deuxième position, une première extré-

mité (21) de la poignée de porte (20) est à l'extérieur du renforcement de boîtier (13) ;
un élément de commutation (30) agencé sur la structure de support (10) ; et

un élément de transmission (40) agencé de manière rotative sur la structure de support (10) par un deuxième arbre de rotation (41) et situé sur le deuxième côté (12), dans lequel l'élément de transmission (40) est raccordé à une deuxième extrémité (22) de la poignée de porte (20), quand la poignée de porte (20) est mise en rotation depuis la première position jusque sur la deuxième position, la poignée de porte (20) entraîne l'élément de transmission (40) à des fins de déplacement, et, quand la poignée de porte (20) est dans la deuxième position, l'élément de transmission (40) vient prendre appui sur l'élément de commutation (30), et l'élément de commutation (30) génère un signal électrique pour commander le déverrouillage d'une porte, dans lequel la poignée de porte (20) sert à entraîner l'élément de transmission (40) à des fins de rotation ;

caractérisé par un élément élastique (60) agencé sur la structure de support (10), dans lequel l'élément élastique (60) est espacé par rapport à l'élément de commutation, la poignée de porte (20) est mobile depuis la deuxième position jusque sur une troisième position, et la deuxième position se trouve entre la première position et la troisième position, et dans lequel, lors de la rotation de la poignée de porte (20) depuis la deuxième position jusque sur la troisième position, l'élément de transmission (40) tourne et reste en contact avec l'élément de commutation (30), et, quand la poignée de porte (20) est dans la troisième position, l'élément de transmission vient prendre appui de manière élastique sur l'élément élastique (60), de telle sorte que l'élément élastique (60) peut tenir lieu de structure de limitation souple sur l'élément de transmission (40), et former un retour à la poignée de porte (20).

2. Appareil formant poignée de porte (100) pour un véhicule selon la revendication 1, dans lequel, quand la poignée de porte (20) est mise en rotation depuis la première position jusque sur la deuxième position, une distance angulaire que la poignée de porte (20) parcourt se trouve dans les limites de la plage allant de 7° à 13°.
3. Appareil formant poignée de porte (100) pour un véhicule selon la revendication 1, comportant un élément de poussée (50) raccordant la deuxième extrémité (22) de la poignée de porte (20) et l'élément de transmission (40), dans lequel l'élément de poussée (50) passe au travers de la structure de support

(10), et la poignée de porte (20) sert à entraîner l'élément de transmission (40) à des fins de déplacement par le biais de l'élément de poussée (50).

4. Appareil formant poignée de porte (100) pour un véhicule selon la revendication 1, dans lequel l'élément élastique (60) comporte un élément de mise en appui (61) et un premier élément élastique (62), l'élément de mise en appui (61) est agencé de manière rotative sur la structure de support (10) par un troisième arbre de rotation (63), le premier élément élastique (62) est raccordé à l'élément de mise en appui (61), quand la poignée de porte (10) est dans la troisième position, l'élément de transmission (40) vient prendre appui sur l'élément de mise en appui (61), et le premier élément élastique (62) exerce une première force de restauration sur l'élément de mise en appui (61).
5. Appareil formant poignée de porte (100) pour un véhicule selon la revendication 1, dans lequel, quand la poignée de porte (20) est mise en rotation depuis la première position jusque sur la troisième position, une distance angulaire que la poignée de porte (20) parcourt se trouve dans les limites de la plage allant de 14° à 16°.
6. Appareil formant poignée de porte (100) pour un véhicule selon la revendication 4, dans lequel une structure de limitation (15) est mise en oeuvre dans le renforcement de boîtier (13), la poignée de porte (20) est mobile depuis la troisième position jusque sur une quatrième position, la troisième position se trouve entre la deuxième position et la quatrième position, et dans lequel, lors de la rotation de la poignée de porte (20) depuis la troisième position jusque sur la quatrième position, l'élément de transmission (40) tourne et reste en contact avec l'élément élastique (60), et quand la poignée de porte (20) est dans la quatrième position, la deuxième extrémité (22) de la poignée de porte (20) vient prendre appui sur la structure de limitation (15).
7. Appareil formant poignée de porte (100) pour un véhicule selon la revendication 6, dans lequel, quand la poignée de porte (20) est mise en rotation depuis la première position jusque sur la quatrième position, une distance angulaire que la poignée de porte (20) parcourt se trouve dans les limites de la plage allant de 20° à 24°.
8. Appareil formant poignée de porte (100) pour un véhicule selon la revendication 1, dans lequel l'élément de transmission (40) forme une crémaillère courbe (42) agencée de manière concentrique avec le deuxième arbre de rotation (41), l'appareil formant poignée de porte (100) comporte un engrenage (70) agencé de manière rotative sur la structure de sup-

port (10), et l'engrenage (70) s'engrène avec la crémaillère courbe (42).

9. Appareil formant poignée de porte (100) pour un véhicule selon la revendication 1, comportant par ailleurs un deuxième élément élastique (80) raccordant la structure de support (10) et l'élément de transmission (40), dans lequel le deuxième élément élastique (80) sert à exercer une deuxième force de restauration sur l'élément de transmission (40), et la deuxième force de restauration permet à l'élément de transmission (40) de se déplacer pour restaurer la poignée de porte (20) jusque sur la première position.

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10. Appareil formant poignée de porte (100) pour un véhicule selon la revendication 1, dans lequel une surface inférieure du renforcement de boîtier (13) est dotée d'un trou de serrure (16), et le trou de serrure (16) est aligné sur la première extrémité (21) de la poignée de porte (20).

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11. Appareil formant poignée de porte (100) pour un véhicule selon la revendication 4, dans lequel l'élément de mise en appui (61) et l'élément de commutation (30) entrent en contact avec l'élément de transmission (40) respectivement au niveau de différentes parties.

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12. Porte (300) d'un véhicule, comportant :

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un corps de porte (310) ; et

un appareil formant poignée de porte (100) pour un véhicule selon l'une quelconque des revendications 1 à 11, dans lequel l'appareil formant poignée de porte (100) est mis en oeuvre sur le corps de porte (310), et une surface extérieure de la poignée de porte (20) est dans l'alignement d'une surface extérieure du corps de porte (310), ou la surface extérieure de la poignée de porte (20) est renforcée sur la surface extérieure du corps de porte (310).

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13. Véhicule, comportant :

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un châssis de véhicule, et

une porte selon la revendication 12, la porte étant agencée sur le châssis de véhicule.

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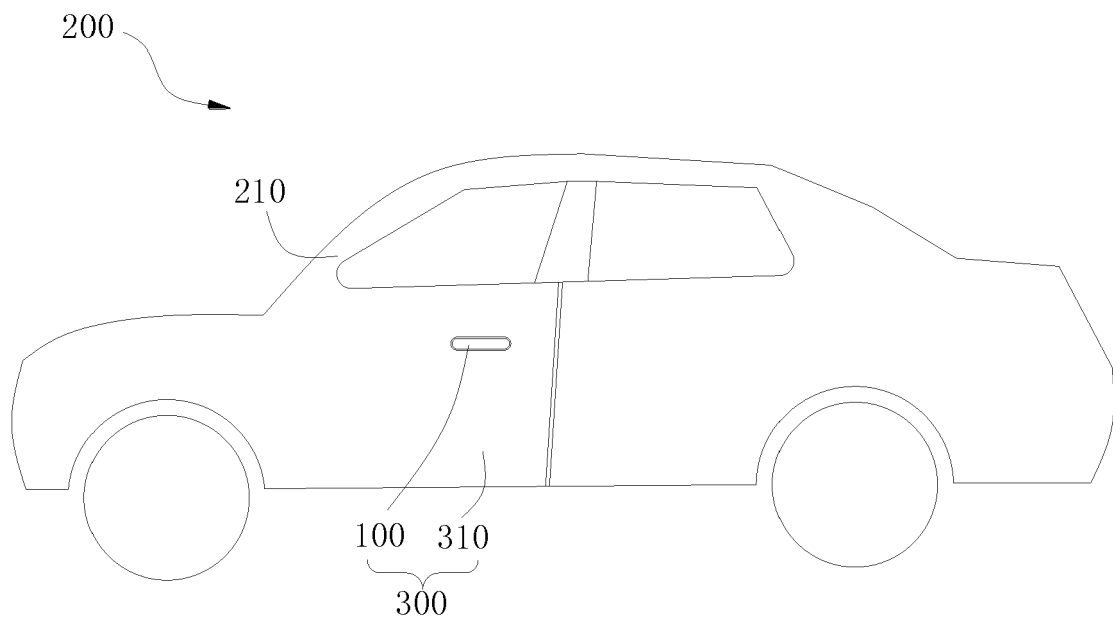


FIG. 1

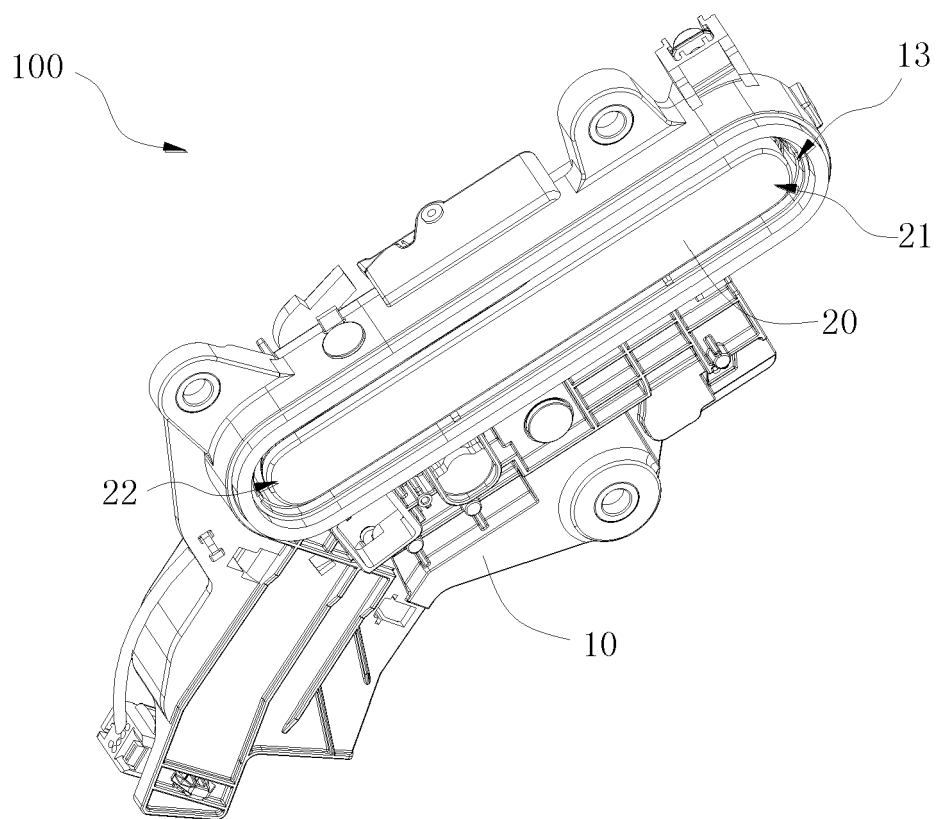


FIG. 2

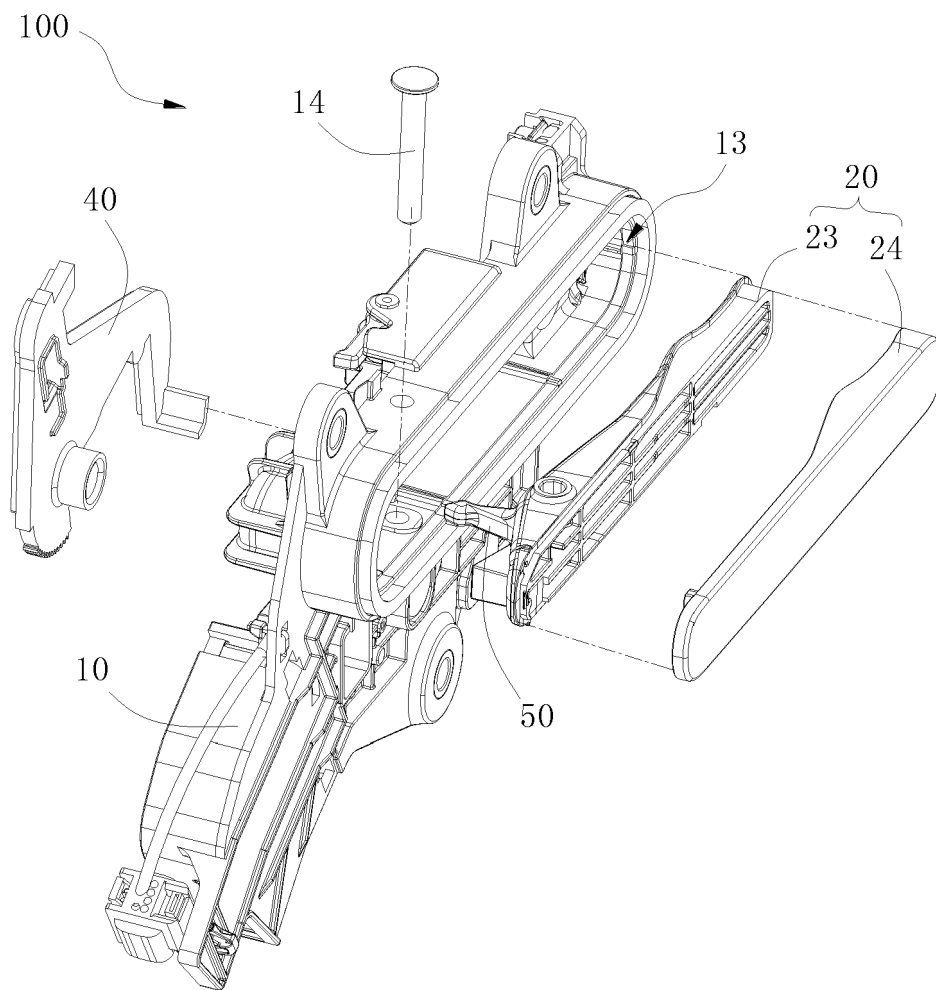


FIG. 3

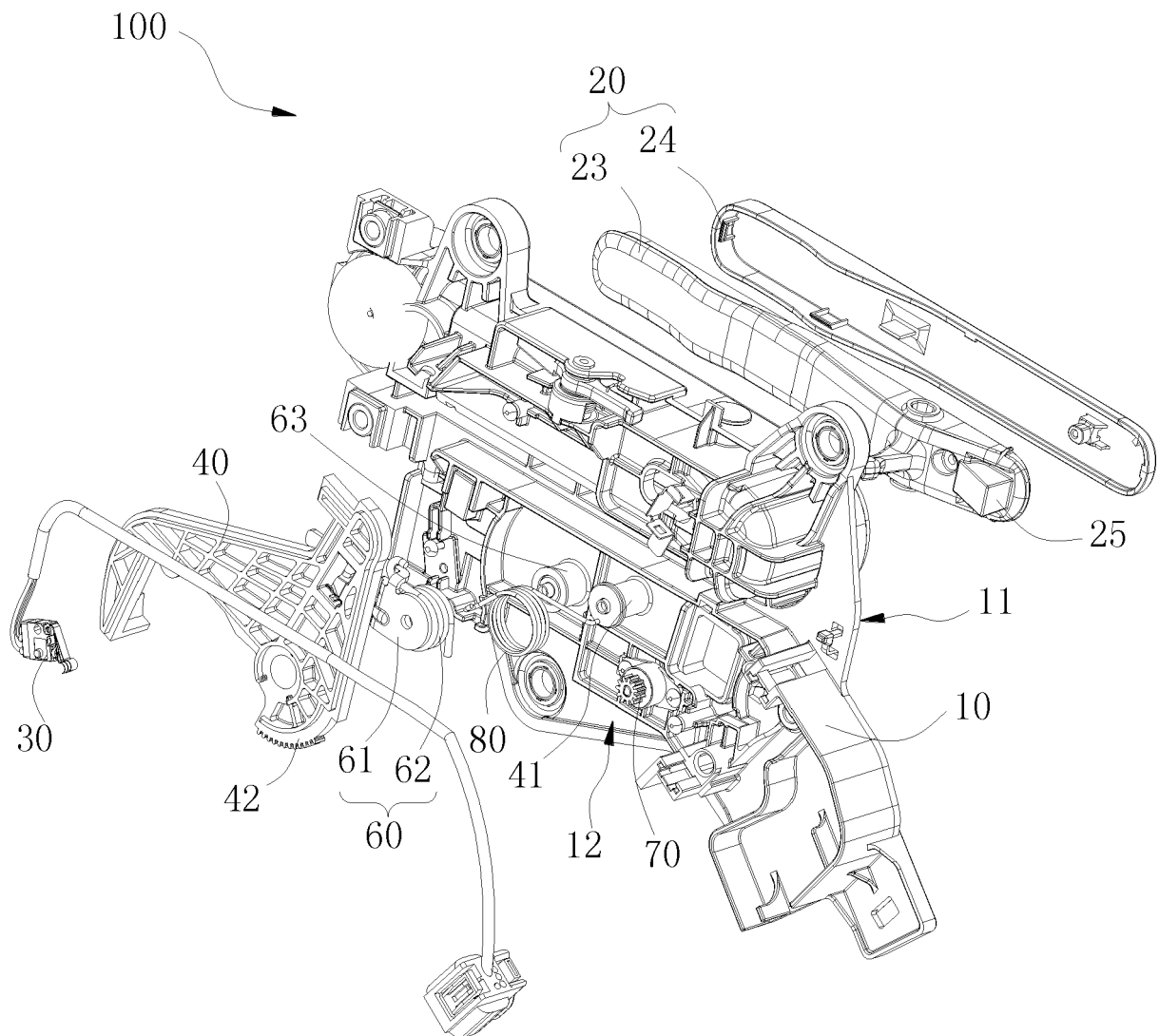


FIG. 4

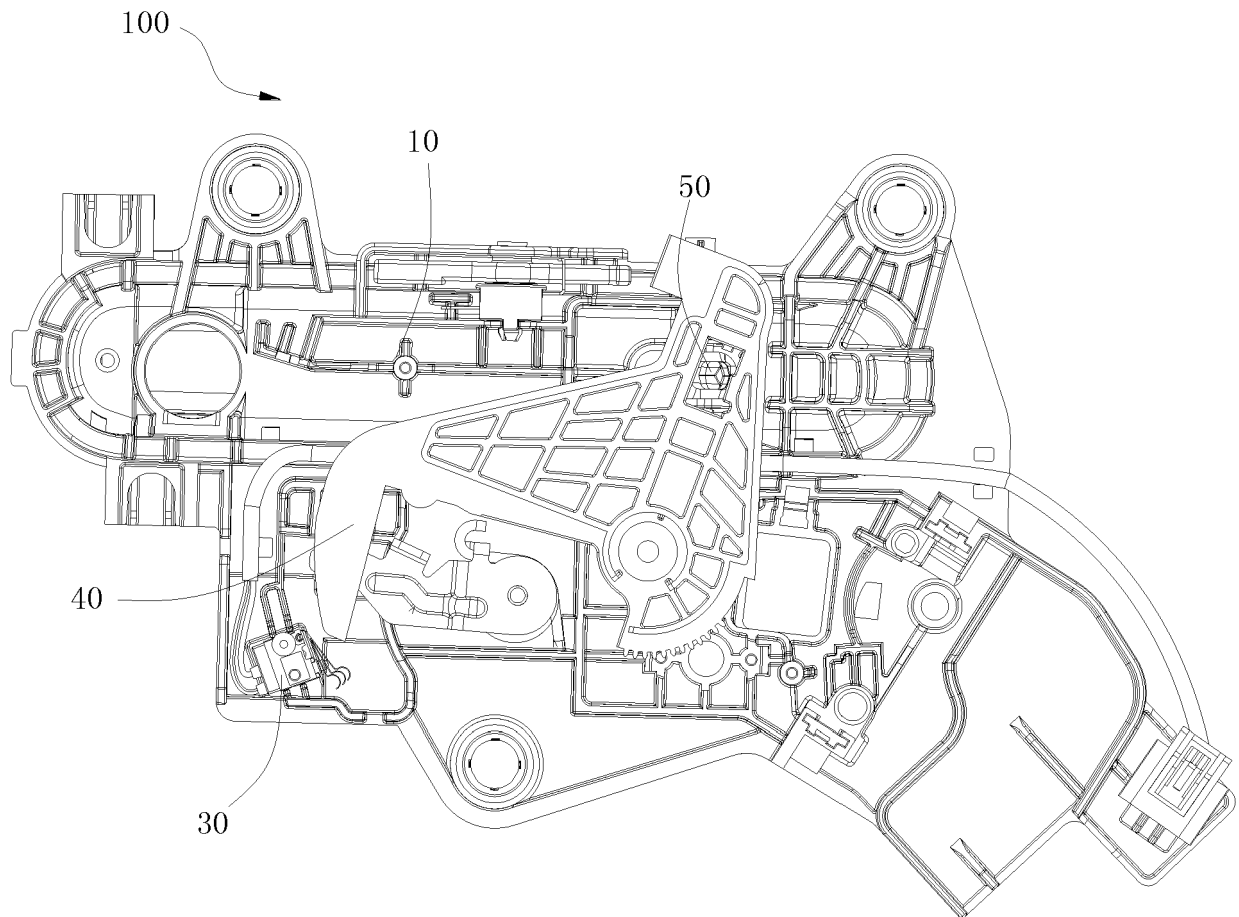


FIG. 5

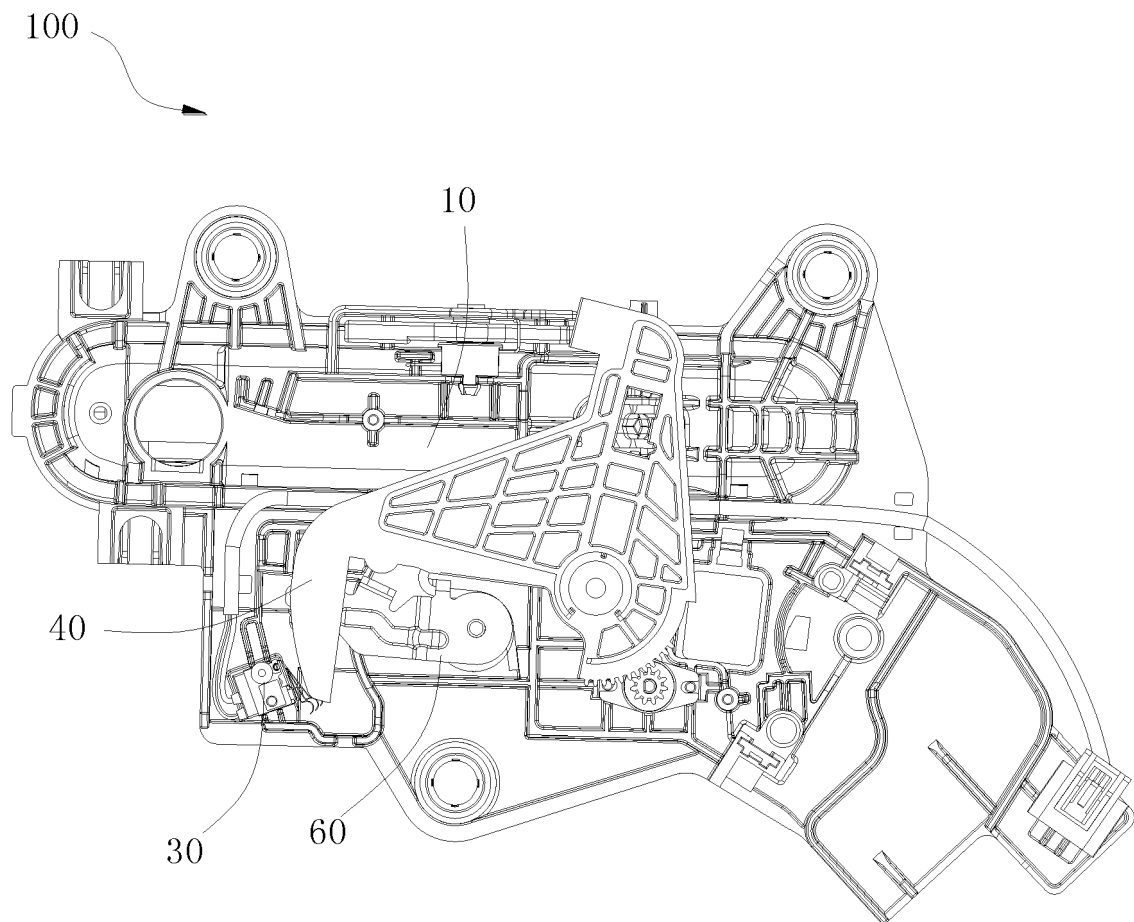


FIG. 6

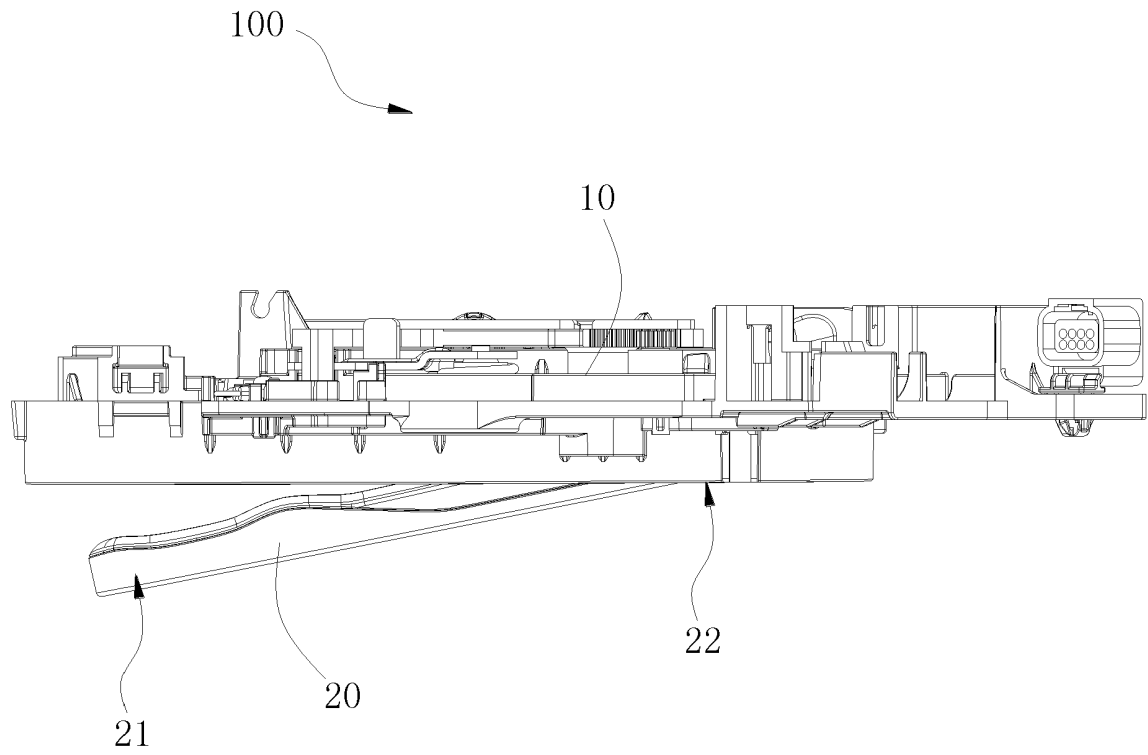


FIG. 7

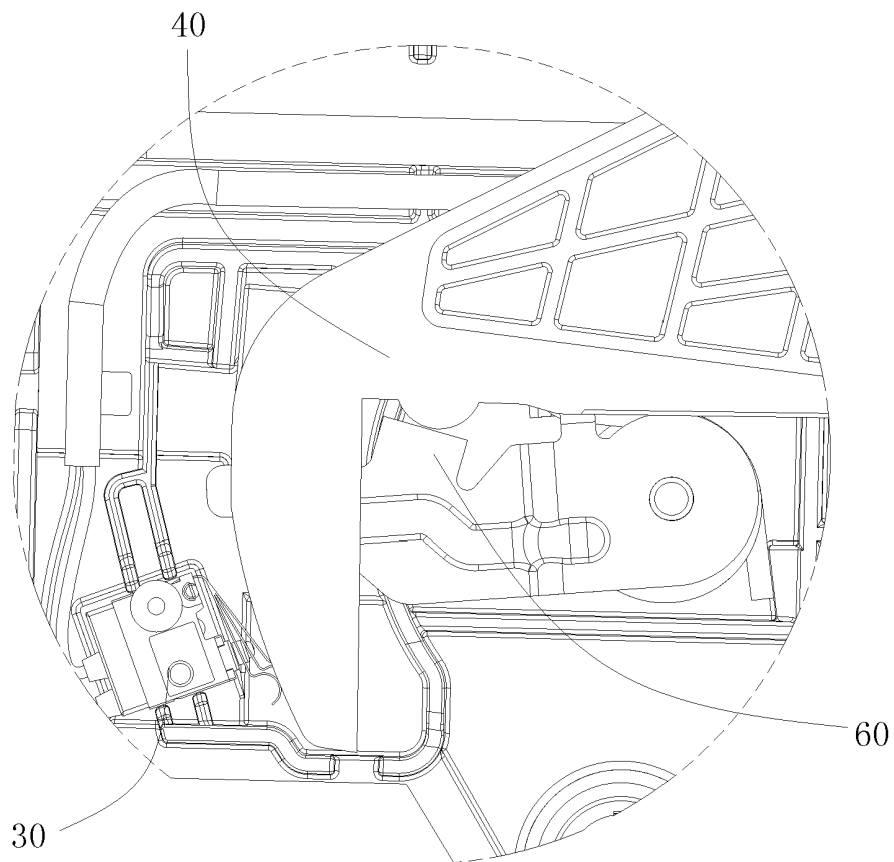


FIG. 8

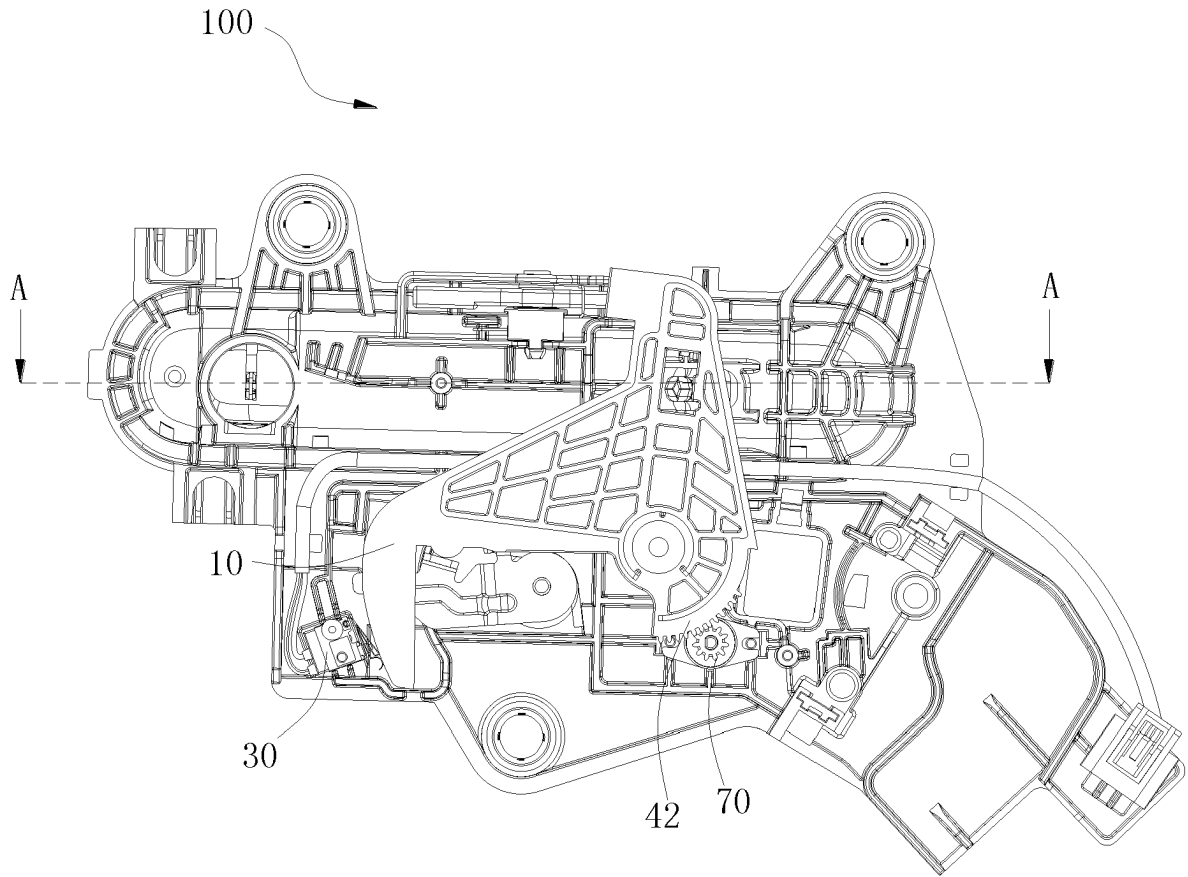


FIG. 9

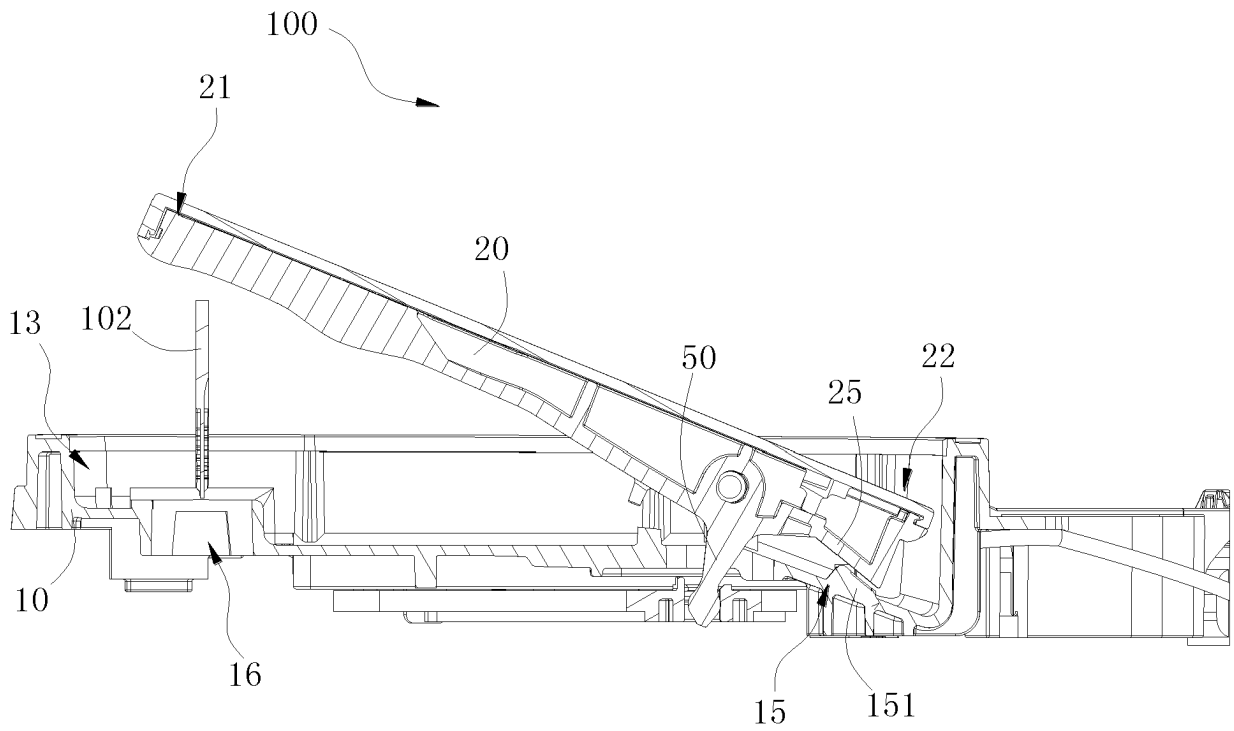


FIG. 10

REFERENCES CITED IN THE DESCRIPTION

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