

(19)



(11)

**EP 3 944 799 A1**

(12)

**EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**02.02.2022 Bulletin 2022/05**

(51) International Patent Classification (IPC):  
**A47K 3/36 (2006.01) E05D 7/04 (2006.01)**

(21) Application number: **20202882.5**

(52) Cooperative Patent Classification (CPC):  
**A47K 3/36; E05D 7/04; A47K 2003/307**

(22) Date of filing: **20.10.2020**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
 Designated Extension States:  
**BA ME**  
 Designated Validation States:  
**KH MA MD TN**

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(30) Priority: **28.07.2020 CN 202010736286**  
**15.09.2020 PCT/CN2020/115326**

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Remarks:  
Amended claims in accordance with Rule 137(2) EPC.

**(54) ADJUSTABLE DOOR FRAME ASSEMBLY, INSTALLATION METHOD AND SHOWER DOOR INSTALLATION STRUCTURE**

(57) The present disclosure discloses an adjustable door frame assembly, an installation method and a shower door installation structure. The adjustable door frame assembly includes a fixed door frame, a movable door frame, an adjusting member and a fastener, a rotating shaft seat being respectively provided at top and bottom of the movable door frame, the adjusting member including a fixed end and a sliding end, the fixed end being connected with the fixed door frame and the sliding end being arranged to slide along a guide groove; and the fastener is arranged at the sliding end. The installation method includes assembling the components, connecting the door frames by insertion, inserting the adjusting member, rotating the adjusting member, translating and adjusting, and locking. The shower door installation structure includes a door panel and a door frame assembly, a rotating shaft seat at the top of a movable door frame is provided with an adjusting member and a fastener, and a bottom of the movable door frame is bonded and fixed with the ground. The present disclosure relates to the field of sanitary ware, and provides a door frame assembly, an installation method and a shower door installation structure. During the adjustment of the door

frame assembly into a vertical state, there is no need to drill holes, which saves manpower and time, and will not damage the frame surface and affect the appearance of products.

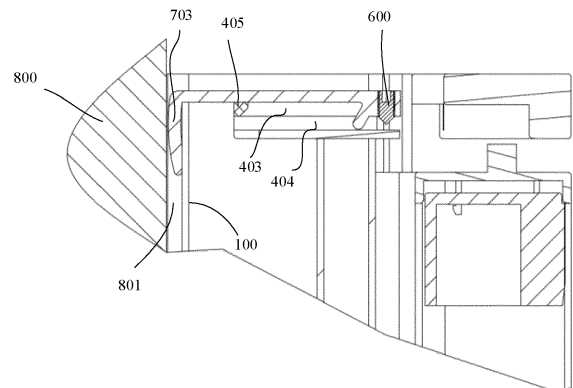


FIG. 15

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## Description

### Technical Field

**[0001]** The present disclosure relates to, but is not limited to, the field of sanitary ware, in particular to an adjustable door frame assembly, an installation method and a shower door installation structure.

### Background

**[0002]** A shower door is usually installed against a wall, and the shower door is installed and connected with the wall through at least two sets of connecting assemblies. The shower door should be kept in a vertical state after installation. However, because a wall surface of a shower room is usually not completely vertical, if the shower door is installed completely along the wall surface, the shower door may not be in the vertical state after installation, which will affect the opening and closing of the shower door. In order to solve this problem, it is needed to adjust the distance between the upper and lower ends of the shower door and the wall surface during installation to ensure that the shower door is in the vertical state.

**[0003]** In order to realize adjustment, the shower door usually includes a fixed door frame for fixing with the wall surface and a movable door frame connected with a door panel, and the fixed door frame and the movable door frame are connected by at least two sets of connecting assemblies. When installing, the fixed door frame is fixed against the wall, then the movable door frame is installed to the fixed door frame. During installation, the movable door frame is adjusted to the vertical state by adjusting the expansion and contraction of the connecting assemblies. Finally, holes are drilled in the movable door frame and the fixed door frame, and the movable door frame and the fixed door frame are fastened together with screws and the like. However, on the one hand, it needs the cooperation of at least two people to drill holes, and it is time-consuming. During the whole drilling process, it needs manpower to keep the movable door frame and the fixed door frame relatively stationary, which makes it difficult to install and impossible to perform secondary adjustment after installation. On the other hand, the manual operation is very unstable, for example, the movable door frame moves relative to the fixed door frame in the drilling process, which not only affects the appearance of the shower door, but also may cause damage to the fixed door frame and the movable door frame, and may even cause the shower door to be scrapped.

### Summary

**[0004]** An embodiment of the present disclosure provides an adjustable door frame assembly, including a fixed door frame fixed to a wall and a movable door frame for installing a door panel, a rotating shaft seat being respectively provided at a top and a bottom of the mov-

able door frame, and including an adjusting member and a fastener, each of the rotating shaft seats being provided with a guide groove, the adjusting member including a fixed end and a sliding end, the fixed end being connected with the fixed door frame, the sliding end being arranged to slide along the guide groove to adjust the movable door frame into a vertical state by making the movable door frame close to or away from the fixed door frame; the fastener being arranged at the sliding end, so that the sliding end is fixed at a position in the guide groove.

**[0005]** According to a possible design, the rotating shaft seat is provided with an anti-falling mechanism, which is a support rod on a sliding path of the sliding end, and the support rod is arranged at one end of the rotating shaft seat close to the fixed door frame, so as to prevent the sliding end from falling off the guide groove which causes the movable door frame to fall in the case of failure of the fastener.

**[0006]** According to a possible design, the rotating shaft seat is provided with an installation groove for accommodating the adjusting member, an extending direction of the installation groove is perpendicular to the movable door frame, and a groove wall of the installation groove is provided with the guide groove.

**[0007]** According to a possible design, the sliding end is provided with bosses protruding towards both sides, and the bosses are inserted into two guide grooves of the rotating shaft seat, respectively.

**[0008]** According to a possible design, the support rod is provided at one end of the installation groove close to the fixed door frame, both ends of the support rod are connected with the groove walls of the installation groove, the sliding end is provided with a retaining rib, and when the sliding end moves to one end of the installation groove close to the fixed door frame, the retaining rib abuts against the support rod to limit the bosses from falling off the guide grooves.

**[0009]** According to a possible design, the rotating shaft seat is provided with an installation notch at one end of the installation groove away from the fixed door frame for sliding the bosses into the guide grooves.

**[0010]** According to a possible design, the bosses are provided on the retaining rib, and the retaining rib extends downwards and inclines towards the fixed door frame.

**[0011]** According to a possible design, a groove bottom of the installation groove is provided with a clearance notch corresponding to the support rod.

**[0012]** According to a possible design, the fastener is a fastening screw, the sliding end is provided with a threaded hole which passes through from top to bottom, and the fastening screw penetrates through the threaded hole and abuts against the groove bottom of the installation groove.

**[0013]** According to a possible design, the fixed end is provided with a hook-shaped hook head which is clamped between the wall and the fixed door frame.

**[0014]** According to a possible design, the hook head is provided with a curved surface on an end face facing

the wall, and the curved surface extends to a hook tip of the hook head.

**[0015]** According to a possible design, the fixed door frame is provided with a positioning notch corresponding to the adjusting member, and the hook head is fitted at the positioning notch.

**[0016]** An embodiment of the present disclosure provides an installation method applied to the above-described adjustable door frame assembly, including:

installing the fixed door frame and assembling the movable door frame with the rotating shaft seats;

connecting the fixed door frame and the movable door frame by corresponding insertion;

keeping the adjusting member vertical and inserting the sliding end into the installation notch to make the bosses slide into the guide grooves;

rotating the adjusting member with the axis of the bosses as the center, so that the fixed end rotates towards the fixed door frame and is fitted with the fixed door frame;

adjusting the movable door frame to make the movable door frame vertical; and

tightening the fastener to fasten the sliding end to the rotating shaft seat.

**[0017]** An embodiment of the present disclosure provides a shower door installation structure, including a door panel and the adjustable door frame assembly described above. The fixed door frame is fixed with a wall, the movable door frame is connected with the door panel, the rotating shaft seat at the top of the movable door frame is provided with the adjusting member and the fastener, and a bottom of the movable door frame is bonded and fixed with the ground.

**[0018]** According to an embodiment of the present disclosure, during the adjustment of the door frame assembly into the vertical state, there is no need to drill holes, which saves manpower and time, and will not damage the frame surface and affect the appearance of products.

**[0019]** The door frame assembly of the embodiment of the present invention is provided with an anti-falling mechanism, for preventing the sliding end from falling off the guide groove which causes the movable door frame to fall in the case of failure of the fastener, which is not only beneficial to installation, but also can prevent the door panel from falling due to loosening of the fastener after long-term use, thereby greatly improving the use experience.

**[0020]** Additional features and advantages of the present disclosure will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by implementation of the

present disclosure. The objects and other advantages of the present disclosure can be realized and obtained by the structure particularly indicated in the description and drawings.

#### Brief Description of Drawings

**[0021]** The drawings are used to provide a further understanding of the technical schemes of the present disclosure, and constitute a part of the description. They are used together with the embodiments of the present application to explain the technical schemes of the present disclosure, and do not constitute a restriction on the technical schemes of the present disclosure.

FIG. 1 is a first schematic diagram of a shower door installation structure according to an embodiment of the present disclosure;

FIG. 2 is an exploded schematic diagram of the shower door installation structure in FIG. 1;

FIG. 3 is a partially enlarged schematic diagram at a position A in FIG. 1;

FIG. 4 is a partially enlarged schematic diagram at a position B in FIG. 1;

FIG. 5 is a partially enlarged schematic diagram at a position C in FIG. 2;

FIG. 6 is a partially enlarged schematic diagram at a position D in FIG. 2;

FIG. 7 is a second schematic diagram of the shower door installation structure in FIG. 1;

FIG. 8 is a schematic diagram of an adjusting member in FIG. 5;

FIG. 9 is a first schematic diagram of an upper rotating shaft seat in FIG. 5;

FIG. 10 is a second schematic diagram of the upper rotating shaft seat in FIG. 5;

FIG. 11 is a schematic diagram of a fixed door frame in FIG. 5;

FIG. 12 is a schematic diagram of the adjusting member inserting into and connecting with the rotating shaft seat in FIG. 3;

FIG. 13 is a first sectional view of the shower door installation structure in FIG. 1;

FIG. 14 is a second sectional view of the shower door installation structure in FIG. 1;

FIG. 15 is a third sectional view of the shower door installation structure in FIG. 1;

FIG. 16 is a fourth sectional view of the shower door installation structure in FIG. 1; and

FIG. 17 is a fifth sectional view of the shower door installation structure in FIG. 1.

Reference signs:

**[0022]** 100-fixed door frame, 101-positioning notch, 200-movable door frame, 201-aluminum fixing element, 202-aluminum rotating shaft element, 203-waterproof rubber strip, 204-lifting seat, 205-decorative cover, 206-self-tapping screw, 300-door panel, 301-glass panel, 302-aluminum element, 303-magnetic strip, 400-upper rotating shaft seat, 401-main body, 402-rotating shaft, 403-installation groove, 404-guide groove, 405-support rod, 406-installation notch, 407-clearance notch, 408-first inclined surface, 409-fixing hole, 410-transition panel, 411-fixing portion, 412-rotating shaft portion, 500-lower rotating shaft seat, 600-fastening screw, 700-adjusting member, 701-fixed end, 702-sliding end, 703-hook head, 704-threaded hole, 705-retaining rib, 706-boss, 707-curved surface, 800-wall, 801-installation gap.

Detailed Description

**[0023]** In order to make the objects, technical schemes and advantages of the present disclosure clearer, the embodiments of the present disclosure will be described in detail below with reference to the drawings. It should be noted that the embodiments in the present application and the features in the embodiments can be arbitrarily combined with each other if there is no conflict.

**[0024]** Referring to a shower door installation structure of an embodiment of the present disclosure shown in FIGS. 1 to 17, the shower door installation structure includes a door panel 300 and an adjustable door frame assembly. The door frame assembly includes a fixed door frame 100 fixed to a wall 800 and a movable door frame 200 for installing the door panel 300. The fixed door frame 100 is configured to insert into and connect to the movable door frame 200 with an adjustable insertion depth, so as to adjust the door panel 300 and the movable door frame 200 into a vertical state (i.e., perpendicular to the ground).

**[0025]** As shown in FIG. 1 to FIG. 7, the door frame assembly includes a fixed door frame 100 and a movable door frame 200 that are configured to be connected by insertion. The top and bottom of the movable door frame 200 are respectively provided with a rotating shaft seat, and the two rotating shaft seats may be an upper rotating shaft seat 400 at the top and a lower rotating shaft seat 500 at the bottom due to different positions. In addition, separate adjusting member 700 and fastener are provided on the upper rotating shaft seat 400. The upper rotat-

ing shaft seat 400 is provided with a guide groove 404. The adjusting member 700 is an elongated profile. The adjusting member 700 includes a fixed end 701 and a sliding end 702. The fixed end 701 is configured to connect with the fixed door frame 100, and the sliding end 702 is arranged to slide along the guide groove 404 to adjust the vertical state of the movable door frame 200 by making it close to or away from the fixed door frame 100. In some exemplary embodiments, the fastener may be a fastening screw 600, and the fastening screw 600 is arranged at the sliding end 702, so that the sliding end 702 is fixed at a position in the guide groove 404 to lock the movable door frame 200.

**[0026]** As for the fixed door frame 100, as shown in FIG. 2, FIG. 7 and FIG. 11, the fixed door frame 100 is an elongated aluminum element with semi-enclosed cross section. An opening of the fixed door frame 100 faces away from the wall 800, that is, faces the movable door frame 200. After the fixed door frame 100 is fixed to the wall 800, an installation gap 801 is formed between a web of the fixed door frame 100 and a wall surface of the wall 800.

**[0027]** As for the movable door frame 200, as shown in FIGS. 1 to 7 and 10, the movable door frame 200 includes an aluminum fixing element 201, an aluminum rotating shaft element 202, a waterproof rubber strip 203, a lifting seat 204 and a decorative cover 205, in addition to the upper rotating shaft seat 400 and the lower rotating shaft seat 500 described above. The aluminum fixing element 201 is an elongated aluminum element with a semi-enclosed cross section. An opening of the aluminum fixing element 201 faces the wall 800 and is slightly wider than the fixed door frame 100, so that the fixed door frame 100 can be inserted into the aluminum fixing element 201 through the opening of the aluminum fixing element 201. The insertion depth of the fixed door frame 100 into the aluminum fixing element 201 is the depth with which the fixed door frame 100 is inserted into and connected to the movable door frame 200. The aluminum rotating shaft element 202 is an elongated aluminum element with a fully enclosed cross section. The aluminum rotating shaft element 202 is configured to parallel to the aluminum fixing element 201 and be connected by the upper rotating shaft seat 400 and the lower rotating shaft seat 500. A lifting seat 204 is respectively inserted into and connected to the upper and lower ends of the aluminum rotating shaft element 202. The lifting seat 204 is provided with a protruding shaft seat. A decorative cover 205 covers the lifting seat 204 and has a through hole for inserting the shaft seat. The upper rotating shaft seat 400 connects the aluminum rotating shaft element 202 with the aluminum fixing element 201 in the same way as the lower rotating shaft seat 500 connects the aluminum rotating shaft element 202 with the aluminum fixing element 201. Taking the upper rotating shaft seat 400 as an example, a portion of the upper rotating shaft seat 400 is fitted to the upper end of the aluminum fixing element 201 and fixed by a self-tapping screw 206, while the other

portion of the upper rotating shaft seat 400 is fitted to the upper end of the aluminum rotating shaft element 202 and provided with a downward extending rotating shaft 402. The rotating shaft 402 can be inserted into a shaft seat of the lifting seat 204 to form a rotary connection between the upper rotating shaft seat 400 and the aluminum rotating shaft element 202, that is, the aluminum rotating shaft element 202 can rotate around an axis of the rotating shaft 402, thereby opening and closing the door panel. In addition, the waterproof rubber strip 203 is arranged between the aluminum fixing element 201 and the aluminum rotating shaft element 202. The waterproof rubber strip 203 having elasticity fills the gap between the aluminum fixing element 201 and the aluminum rotating shaft element 202, which can ensure sealing when the aluminum rotating shaft element 202 rotates, prevent water from splashing through the gap, and can improve user experience.

**[0028]** As for the door panel 300, as shown in FIG. 2, the door panel 300 includes a glass panel 301, an aluminum element 302 and a magnetic strip 303. One end of the glass panel 301 can be fixed with the aluminum rotating shaft element 202, and the other end of the glass panel 301 is fixed with the aluminum element 302. The magnetic strip 303 is embedded in the aluminum element 302. Correspondingly, a magnetic material with different magnetism or a metal material that can be attracted by a magnet, corresponding to the magnetic strip 303, can be provided at the wall at the other side of the door panel 300, to lock the door closed. In addition, a gap is left between a lower side of the door panel 300 and the ground, to facilitate the opening and closing of the door panel 300, and a water retaining strip can be correspondingly provided at the gap.

**[0029]** As for the adjusting member 700, as shown in FIGS. 8 and 12, the adjusting member 700 is an elongated metal profile, and the fixed end 701 and the sliding end 702 are the two ends of the adjusting member 700 in a length direction, respectively. The fixed end 701 is provided with a hook-shaped hook head 703 that is bent to one side. A retaining rib 705 extends from a lower end of the sliding end 702 facing a groove bottom of the installation groove 403. The retaining rib 705 is provided with protruding and circular bosses 706 on both sides of the free end thereof. The sliding end 702 is provided with a through threaded hole 704. In addition, the end face of the hook head 703 facing away from the sliding end 702 is provided with a curved surface 707 which extends to a hook tip of the hook head 703.

**[0030]** The difference between the upper rotating shaft seat 400 and the lower rotating shaft seat 500 is that the upper rotating shaft seat 400 is provided with the adjusting member 700, the fastening screw 600, the guide groove 404 and the like. As shown in FIGS. 9 and 10, the upper rotating shaft seat 400 includes a main body 401, which is divided into a fixing portion 411 corresponding to the aluminum fixing element 201 and a rotating shaft portion 412 corresponding to the aluminum rotating

shaft element 202. The fixing portion 411 is provided with two through fixing holes 409 for driving the self-tapping screw 206 into the aluminum fixing element 201. A lower end of the rotating shaft portion 412 is provided with a protruding rotating shaft 402. The top of the fixing portion 411 is provided with an installation groove 403 for accommodating the adjusting member 700. The installation groove 403 is arranged along a length direction of the upper rotating shaft seat and extends to the rotating shaft portion 412. The two side walls of the installation groove 403 are respectively provided with the guide groove 404 near the groove bottom, and the guide grooves 404 are arranged in the same direction as the installation groove 403, so that after the two bosses 706 of the adjusting member 700 are respectively inserted into the two guide grooves 404, the adjusting member 700 can slide in the installation groove 403 and only slide along the guide grooves 404. An installation notch 406 is provided between the fixing portion 411 and the rotating shaft portion 412. The installation notch 406 is located at one end of the installation groove 403, so that the bosses 706 of the sliding end 702 can slide into the guide grooves 404. In addition, the panel at the groove bottom of the installation groove 403 continues to extend towards the installation notch 406 to form a transition panel 410.

**[0031]** As shown in FIG. 9 and FIG. 10, the other end of the installation groove 403 is provided with a support rod 405 which traverses within the installation groove 403, and both ends of the support rod 405 are connected with the groove walls of the installation groove 403. When the sliding end 702 slides to the support rod 405 of the installation groove 403, the retaining rib 705 can abut against the support rod 405 to prevent the sliding end 702 from sliding out of the installation groove 403, thereby preventing the adjusting member 700 from separating from the upper rotating shaft seat 400. The support rod 405 and the retaining rib 705 constitute an anti-falling mechanism. In addition, the groove bottom of the installation groove 403 is provided with a clearance notch 407 corresponding to the support rod 405.

**[0032]** After the door frame assembly is installed in place, the hook head 703 of the adjusting member 700 is clamped between the wall 800 and the fixed door frame 100, the adjusting member 700 rests on the support rod 405, and the fastening screw 600 at the sliding end 702 abuts against the groove bottom of the installation groove 403 to position the sliding end 702 and fix the upper end of the fixed door frame 100 and the upper end of the movable door frame 200 relative to each other. The web of the fixed door frame 100 is provided with a positioning notch 101 corresponding to the hook head of the adjusting member 700, and the hook head 703 is fitted at the positioning notch 101. Even if the fastening screw 600 fails, i.e., the fastening screw 600 does not abut against the groove bottom of the installation groove 403, due to the weight of the door panel 300, the upper rotating shaft seat 400 together with the movable door frame 200 will move away from the fixed door frame 100, and the sliding

end 702 will move towards the wall 800 relative to the installation groove 403 until the retaining rib 705 abuts against the support rod 405, as shown in FIG. 16. Therefore, when the fastening screw 600 fails, the anti-falling mechanism can prevent the sliding end 702 from falling off the guide groove 404 and causing the movable door frame 200 to fall, thereby improving the safety of use. In addition, in some exemplary embodiments, the retaining rib 705 extends downward and inclines towards the fixed door frame 100. Correspondingly, the support rod 405 is provided with a first inclined surface 408 at the end face facing the rotating shaft portion 412, so that the first inclined surface 408 fits with the retaining rib 705 when the retaining rib 705 abuts against the support rod 405.

**[0033]** As the wall surface of the wall 800 may be inclined to a certain extent, the fixed door frame 100 fitted on the wall will also have a certain inclination. In this case, it is needed to adjust the movable door frame 200 to keep it vertical so as not to affect the opening and closing of the shower door. The adjustable door frame assembly can be installed according to the following steps to keep the movable door frame vertical. Firstly, the fixed door frame 100 is installed and the movable door frame 200 with rotating shaft seats is assembled. Secondly, the movable door frame 200 is lifted and connected with the fixed door frame 100 by corresponding insertion, the fixed door frame 100 is completely inserted into the aluminum fixing element 201, and the depth of the fixed door frame 100 inserted into the movable door frame 200 is maximized. Then, as shown in FIG. 12, the adjusting member 700 is kept vertical, and then moved downward until the sliding end 702 is inserted into the installation notch 406 as shown in FIG. 13, and the adjusting member 700 is translated so that the end of the retaining rib 705 provided with the bosses 706 is fitted on the transition panel 410. Then, as shown in FIG. 14, the adjusting member 700 is rotated around the axis a of the bosses, and in this process, the adjusting member 700 is appropriately translated and the hook head 703 is rotated towards the fixed door frame 100 and fitted with the fixed door frame 100, as shown in FIG. 15, so that the movable door frame 200 can move away from the fixed door frame 100 under the guidance of the adjusting member 700 and the guide grooves 404. The movable door frame 200 is continued to move until the movable door frame 200 is vertical, and it is determined that this state is the final locked state. Finally, the fastening screw 600 is tightened, and the fastening screw 600 passes through the sliding end 702 and abuts against the rotating shaft seat, as shown in FIG. 17. In some exemplary embodiments, the fastening screw 600 may be pre-installed on the adjusting member 700, but it is not screwed to the deepest fitting position, and the fastening screw 600 is not completely tightened until the adjustment of the movable door frame 200 is completed.

**[0034]** In some exemplary embodiments, the upper end of the door frame assembly is locked by the adjusting member 700 and the fastening screw 600 after adjust-

ment, while the lower rotating shaft seat 500 at the lower end and the movable door frame 200 can be adhered to the ground by adhesive after adjustment.

**[0035]** When installing the shower door installation structure, reference can be made to the installation method of the door frame assembly. When assembling the movable door frame 200, the door panel 300 needs to be fixed to the movable door frame 200. After the adjusting member 700 is inserted into the upper end of the door frame assembly, the position of the upper end of the door frame assembly is adjusted. Even if the control over the movable door frame 200 and the door panel 300 is lost due to misoperation in the adjustment process, the anti-falling mechanism can prevent the movable door frame 200 and the door panel 300 from tilting and falling off, which can improve the installation safety. After the adjustment is completed, they can be locked with the fastening screw 600. The lower end of the door frame assembly is not provided with an adjusting member 700, and can be fixed by adhesive after adjusting the movable door frame 200 without inserting the adjusting member 700.

**[0036]** In some exemplary embodiments, the lower rotating shaft seat 500 forms a sliding connection with the fixed door frame 100 through an adjusting member, and is locked by the fastening screw 600.

**[0037]** The upper rotating shaft seat 400 serves as a first rotating shaft seat. In some exemplary embodiments, the sliding end 702 of the adjusting member 700 is provided with the guide groove 404, the installation groove 403, and the anti-falling mechanism. A slider structure at the upper end of the first rotating shaft seat may slide along the guide groove 404 of the sliding end 702, so as to form a sliding fit between the sliding end 702 and the first rotating shaft seat, so that the top of the movable door frame 200 may move close to or away from the fixed door frame 100 to adjust the vertical state of the movable door frame 200.

**[0038]** In combination with the above embodiments, there is no need to drill hole when adjusting the door frame assembly of the embodiment of the present disclosure into a vertical state, which saves manpower and time, and does not damage the frame surface and affect the appearance of products. The door frame assembly of the embodiment of the present disclosure is provided with an anti-falling mechanism, for preventing the sliding end from falling off the guide groove which causes the movable door frame to fall in the case of failure of the fastener, which is not only beneficial to installation, but also can prevent the door panel from falling off due to loosening of the fastener after long-term use, thereby greatly improving the use experience.

**[0039]** In the description of the present disclosure, it should be noted that an orientation or positional relationship indicated by the terms "upper", "lower", "one side", "the other side", "one end", "the other end", "side", "opposite", "four corners", "periphery", "□-shaped struc-

ture" and the like is an orientation or positional relationship based on the drawings, which is only for the convenience of describing the present disclosure and simplifying the description, and does not indicate or imply that the structure referred to has a specific orientation or is constructed and operated with a specific orientation, and therefore it cannot be understood as a limitation of the present disclosure.

**[0040]** In the description of embodiments of the present disclosure, unless otherwise explicitly specified and limited, the terms "connection", "direct connection", "indirect connection", "fixed connection", "installation" and "assembly" should be understood in a broad sense. For example, they can be fixed connection, detachable connection or integrated connection. The terms "installation", "connection" and "fixed connection" can be direct connection, or indirect connection through an intermediate medium, or internal communication between two elements. For those of ordinary skill in the art, the specific meanings of the above terms in the present disclosure can be understood according to specific situations.

**[0041]** Although the embodiments disclosed in the present disclosure are as above, the embodiments are described only for the convenience of understanding the present disclosure, and are not intended to limit the present disclosure. Without departing from the scope of the invention, any person skilled in the art to which the invention pertains can make any modifications and changes in the implementation forms and details, but the scope of patent protection of the invention shall still be defined by the appended claims.

### Claims

1. An adjustable door frame assembly, comprising a fixed door frame (100) fixed to a wall (800) and a movable door frame (200) for installing a door panel (300), a rotating shaft seat (400, 500) being respectively provided at a top and a bottom of the movable door frame (200), wherein the rotating shaft seats (400, 500) include a first rotating shaft seat (400), the adjustable door frame assembly comprises an adjusting member (700) and a fastener, the adjusting member (700) comprises a fixed end (701) and a sliding end (702), the fixed end (701) is configured to connect with the fixed door frame (100), and the sliding end (702) is configured to slidably fit with the first rotating shaft seat (400), when the first rotating shaft seat (400) slides relative to the sliding end (702), a top or bottom of the movable door frame (200) provided with the first rotating shaft seat (400) moves close to or away from the fixed door frame (100) to adjust the movable door frame (200) into a vertical state; the fastener is configured to make the sliding end (702) be fixed relative to the first rotating shaft seat (400) in a plurality of sliding positions of the sliding end (702).

2. The adjustable door frame assembly according to claim 1, wherein the first rotating shaft seat (400) is provided with a guide groove (404), the sliding end (702) is configured to slide along the guide groove (404), and the fastener is configured to fix the sliding end (702) at a position in the guide groove (404).
3. The adjustable door frame assembly according to claim 2, wherein the first rotating shaft seat (400) is provided with an anti-falling mechanism, the anti-falling mechanism is a support rod (405) on a sliding path of the sliding end (702), and the support rod (405) is arranged at one end of the first rotating shaft seat (400) close to the fixed door frame (100), the support rod (405) is configured to prevent the sliding end (702) from falling off the guide groove (404) which causes the movable door frame (200) to fall in the case of failure of the fastener.
4. The adjustable door frame assembly according to claim 3, wherein the first rotating shaft seat (400) is provided with an installation groove (403) for accommodating the adjusting member (700), an extending direction of the installation groove (403) is perpendicular to the movable door frame (200), and a groove wall of the installation groove (403) is provided with the guide groove (404).
5. The adjustable door frame assembly according to claim 4, wherein the sliding end (702) is provided with bosses (706) protruding towards both sides, and the bosses are inserted into two guide grooves (404) of the first rotating shaft seat (400), respectively.
6. The adjustable door frame assembly according to claim 5, wherein the support rod (405) is arranged at one end of the installation groove (403) close to the fixed door frame (100), both ends of the support rod (405) are configured to connect with groove walls of the installation groove (403), the sliding end (702) is provided with a retaining rib (705), and when the sliding end (702) moves to one end of the installation groove (403) close to the fixed door frame (100), the retaining rib (705) abuts against the support rod (405), the support rod (405) is configured to limit the bosses (706) from falling off the guide grooves (404).
7. The adjustable door frame assembly according to claim 5, wherein the first rotating shaft seat (400) is provided with an installation notch (406) at one end of the installation groove (403) away from the fixed door frame (100), the installation notch (406) is configured for sliding the bosses (706) into the guide grooves (404).
8. The adjustable door frame assembly according to claim 6, wherein the bosses (706) are arranged on the retaining rib (705), and the retaining rib (705)

extends downward and inclines towards the fixed door frame (100).

9. The adjustable door frame assembly according to claim 8, wherein a groove bottom of the installation groove (403) is provided with a clearance notch (407) corresponding to the support rod (405). 5
10. The adjustable door frame assembly according to claim 4, wherein the fastener is a fastening screw (600), the sliding end (702) is provided with a threaded hole (704) which passes through from top to bottom, and the fastening screw (600) penetrates through the threaded hole (704) and abuts against the groove bottom of the installation groove (403). 10
11. The adjustable door frame assembly according to claim 2, wherein the fixed end (701) is provided with a hook-shaped hook head (703) which is clamped between the wall (800) and the fixed door frame (100). 20
12. The adjustable door frame assembly according to claim 11, wherein the hook head (703) is provided with a curved surface (707) on an end face facing the wall (800), and the curved surface (707) extends to a hook tip of the hook head (703). 25
13. The adjustable door frame assembly according to claim 11, wherein the fixed door frame (100) is provided with a positioning notch (101) corresponding to the adjusting member (700), and the hook head (703) is fitted at the positioning notch (101). 30
14. An installation method applied to the adjustable door frame assembly of claim 7, comprising: 35
  - installing the fixed door frame (100) and assembling the movable door frame (200) with the rotating shaft seats (400, 500); 40
  - connecting the fixed door frame (100) and the movable door frame (200) by corresponding insertion;
  - keeping the adjusting member (700) vertical and inserting the sliding end (702) into the installation notch (406) to make the bosses (706) slide into the guide grooves (404); 45
  - rotating the adjusting member (700) with an axis of the bosses (706) as the center, so that the fixed end (701) rotates towards the fixed door frame (100) and is fitted with the fixed door frame (100); 50
  - adjusting the movable door frame (200) to make the movable door frame (200) vertical; and
  - tightening the fastener to fasten the sliding end (702) to the first rotating shaft seat (400). 55

15. A shower door installation structure, comprising a

door panel (300) and the adjustable door frame assembly according to any one of claims 1-13, the fixed door frame (100) being configured to fix with the wall (800), the movable door frame (200) being connected with the door panel (300), the first rotating shaft seat (400) at the top of the movable door frame (200) being provided with the adjusting member (700) and the fastener, and the bottom of the movable door frame (200) being bonded and fixed with the ground.

#### Amended claims in accordance with Rule 137(2) EPC.

1. An adjustable door frame assembly, comprising a fixed door frame (100) fixed to a wall (800) and a movable door frame (200) for installing a door panel (300), a rotating shaft seat (400, 500) being respectively provided at a top and a bottom of the movable door frame (200), wherein the rotating shaft seats (400, 500) include a first rotating shaft seat (400), the adjustable door frame assembly comprises an adjusting member (700) and a fastener, the adjusting member (700) comprises a fixed end (701) and a sliding end (702), the fixed end (701) is configured to connect with the fixed door frame (100), and the sliding end (702) is configured to slidably fit with the first rotating shaft seat (400), when the first rotating shaft seat (400) slides relative to the sliding end (702), a top or bottom of the movable door frame (200) provided with the first rotating shaft seat (400) moves close to or away from the fixed door frame (100) to adjust the movable door frame (200) into a vertical state; the fastener is configured to make the sliding end (702) be fixed relative to the first rotating shaft seat (400) in a plurality of sliding positions of the sliding end (702);

wherein the first rotating shaft seat (400) is provided with a guide groove (404), the sliding end (702) is configured to slide along the guide groove (404), and the fastener is configured to fix the sliding end (702) at a position in the guide groove (404);

wherein the first rotating shaft seat (400) is provided with an anti-falling mechanism, the anti-falling mechanism is a support rod (405) on a sliding path of the sliding end (702), and the support rod (405) is arranged at one end of the first rotating shaft seat (400) close to the fixed door frame (100), the support rod (405) is configured to prevent the sliding end (702) from falling off the guide groove (404) which causes the movable door frame (200) to fall in the case of failure of the fastener.

2. The adjustable door frame assembly according to claim 1, wherein the first rotating shaft seat (400) is

- provided with an installation groove (403) for accommodating the adjusting member (700), an extending direction of the installation groove (403) is perpendicular to the movable door frame (200), and a groove wall of the installation groove (403) is provided with the guide groove (404).
3. The adjustable door frame assembly according to claim 2, wherein the sliding end (702) is provided with bosses (706) protruding towards both sides, and the bosses are inserted into two guide grooves (404) of the first rotating shaft seat (400), respectively.
  4. The adjustable door frame assembly according to claim 3, wherein the support rod (405) is arranged at one end of the installation groove (403) close to the fixed door frame (100), both ends of the support rod (405) are configured to connect with groove walls of the installation groove (403), the sliding end (702) is provided with a retaining rib (705), and when the sliding end (702) moves to one end of the installation groove (403) close to the fixed door frame (100), the retaining rib (705) abuts against the support rod (405), the support rod (405) is configured to limit the bosses (706) from falling off the guide grooves (404).
  5. The adjustable door frame assembly according to claim 3, wherein the first rotating shaft seat (400) is provided with an installation notch (406) at one end of the installation groove (403) away from the fixed door frame (100), the installation notch (406) is configured for sliding the bosses (706) into the guide grooves (404).
  6. The adjustable door frame assembly according to claim 4, wherein the bosses (706) are arranged on the retaining rib (705), and the retaining rib (705) extends downward and inclines towards the fixed door frame (100).
  7. The adjustable door frame assembly according to claim 6, wherein a groove bottom of the installation groove (403) is provided with a clearance notch (407) corresponding to the support rod (405).
  8. The adjustable door frame assembly according to claim 2, wherein the fastener is a fastening screw (600), the sliding end (702) is provided with a threaded hole (704) which passes through from top to bottom, and the fastening screw (600) penetrates through the threaded hole (704) and abuts against the groove bottom of the installation groove (403).
  9. The adjustable door frame assembly according to claim 1, wherein the fixed end (701) is provided with a hook-shaped hook head (703) which is clamped between the wall (800) and the fixed door frame (100).
  10. The adjustable door frame assembly according to claim 9, wherein the hook head (703) is provided with a curved surface (707) on an end face facing the wall (800), and the curved surface (707) extends to a hook tip of the hook head (703).
  11. The adjustable door frame assembly according to claim 9, wherein the fixed door frame (100) is provided with a positioning notch (101) corresponding to the adjusting member (700), and the hook head (703) is fitted at the positioning notch (101).
  12. An installation method applied to the adjustable door frame assembly of claim 5, comprising:
    - installing the fixed door frame (100) and assembling the movable door frame (200) with the rotating shaft seats (400, 500);
    - connecting the fixed door frame (100) and the movable door frame (200) by corresponding insertion;
    - keeping the adjusting member (700) vertical and inserting the sliding end (702) into the installation notch (406) to make the bosses (706) slide into the guide grooves (404);
    - rotating the adjusting member (700) with an axis of the bosses (706) as the center, so that the fixed end (701) rotates towards the fixed door frame (100) and is fitted with the fixed door frame (100);
    - adjusting the movable door frame (200) to make the movable door frame (200) vertical;
    - and
    - tightening the fastener to fasten the sliding end (702) to the first rotating shaft seat (400).
  13. A shower door installation structure, comprising a door panel (300) and the adjustable door frame assembly according to any one of claims 1-11, the fixed door frame (100) being configured to fix with the wall (800), the movable door frame (200) being connected with the door panel (300), the first rotating shaft seat (400) at the top of the movable door frame (200) being provided with the adjusting member (700) and the fastener, and the bottom of the movable door frame (200) being bonded and fixed with the ground.

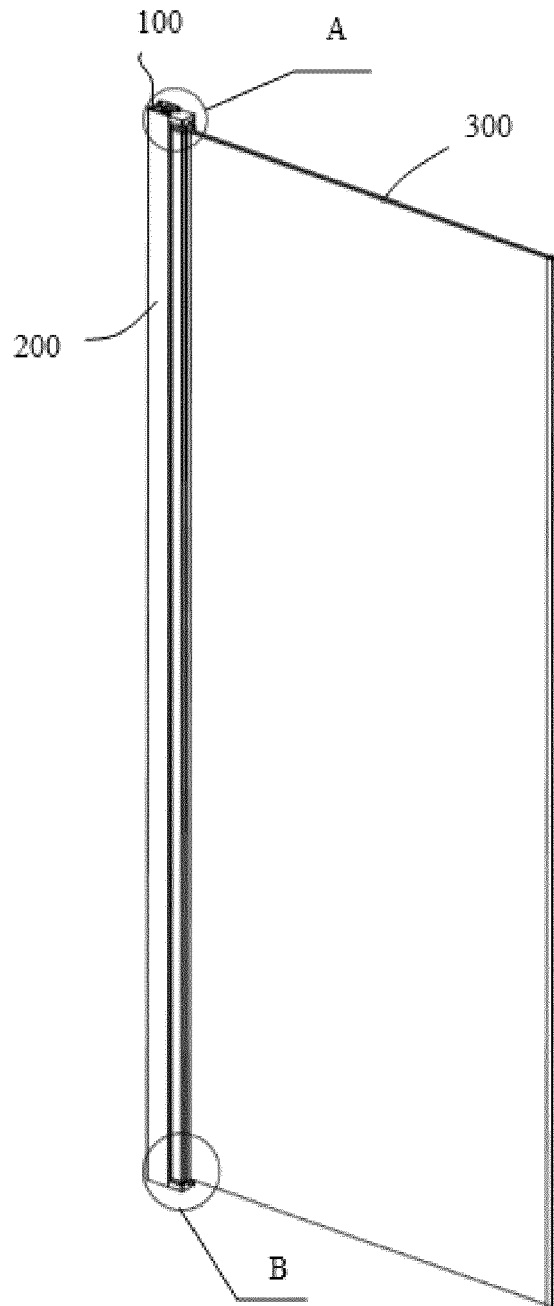


FIG. 1

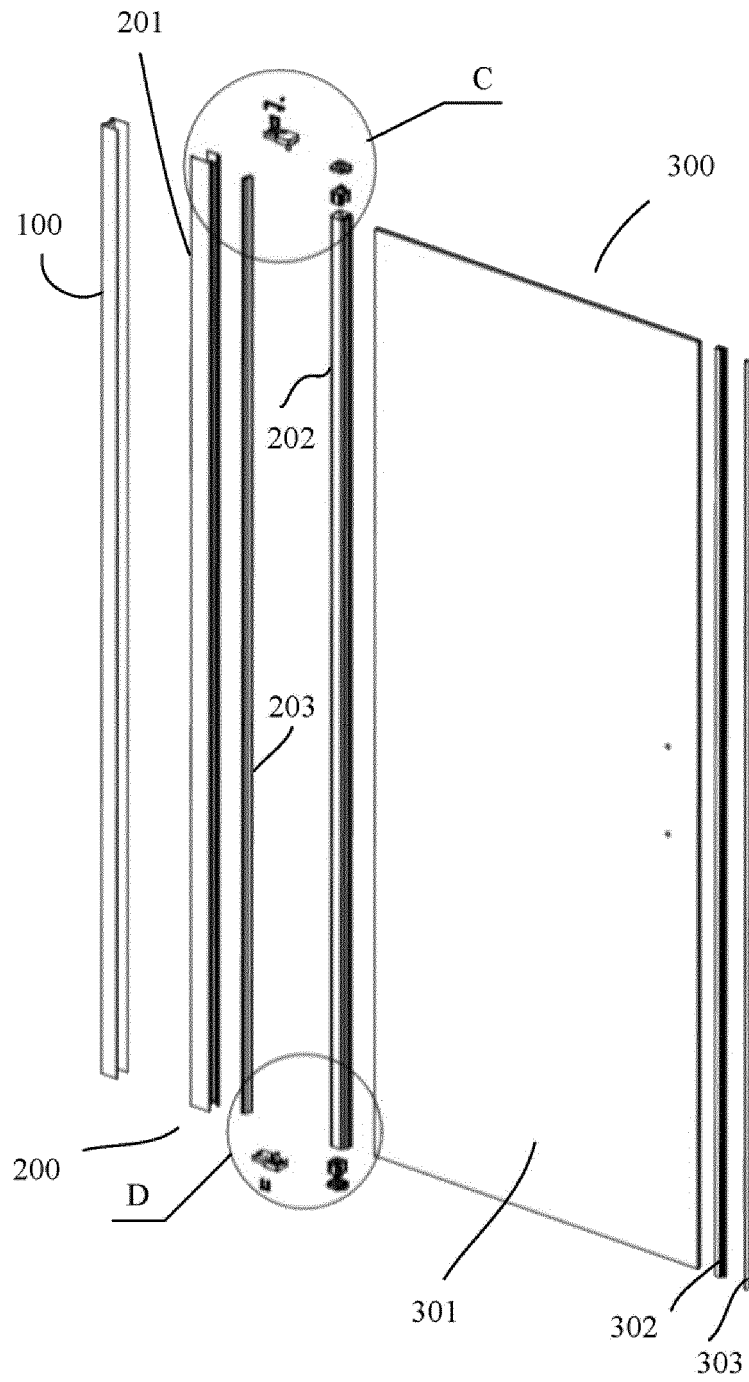


FIG. 2

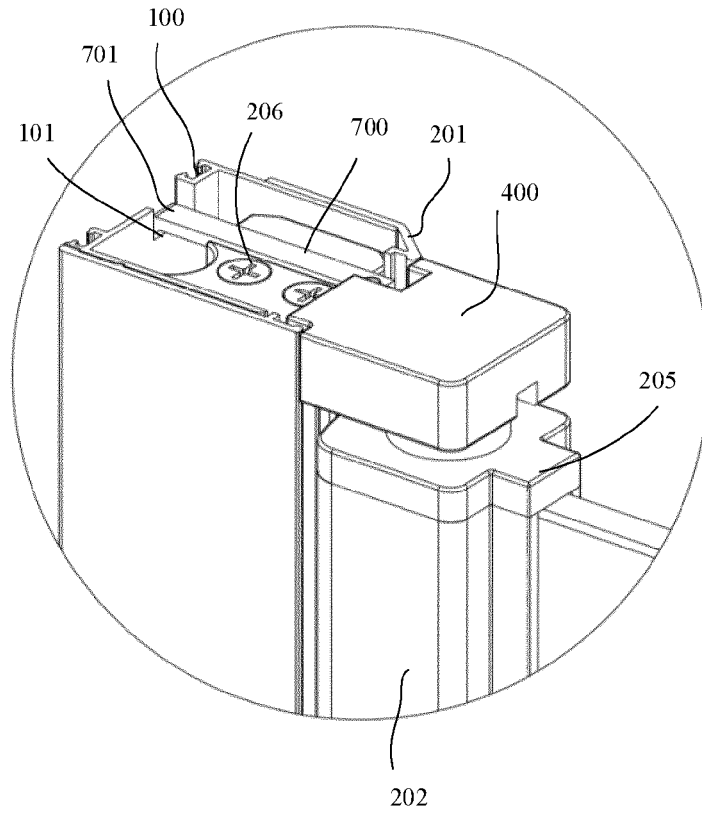


FIG. 3

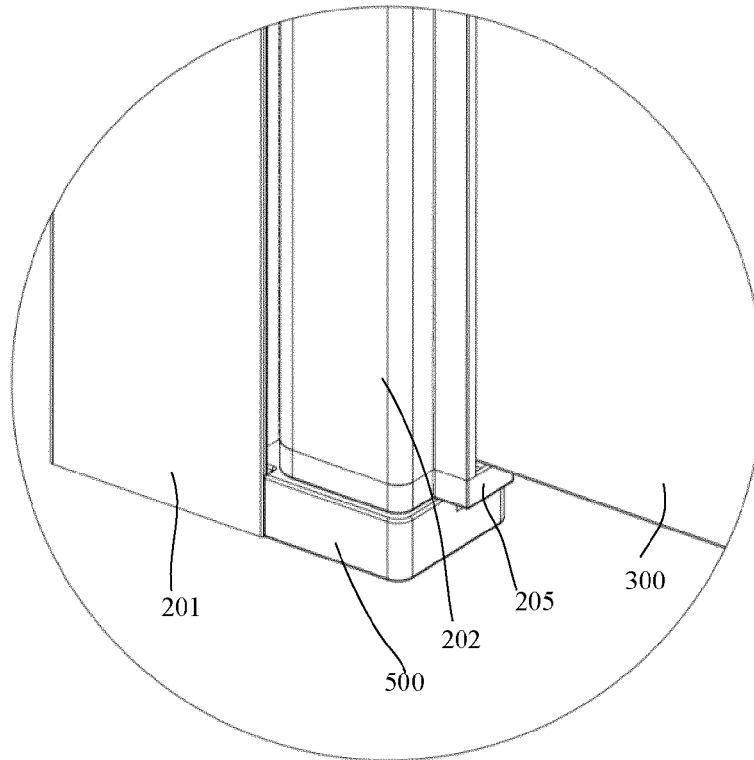


FIG. 4

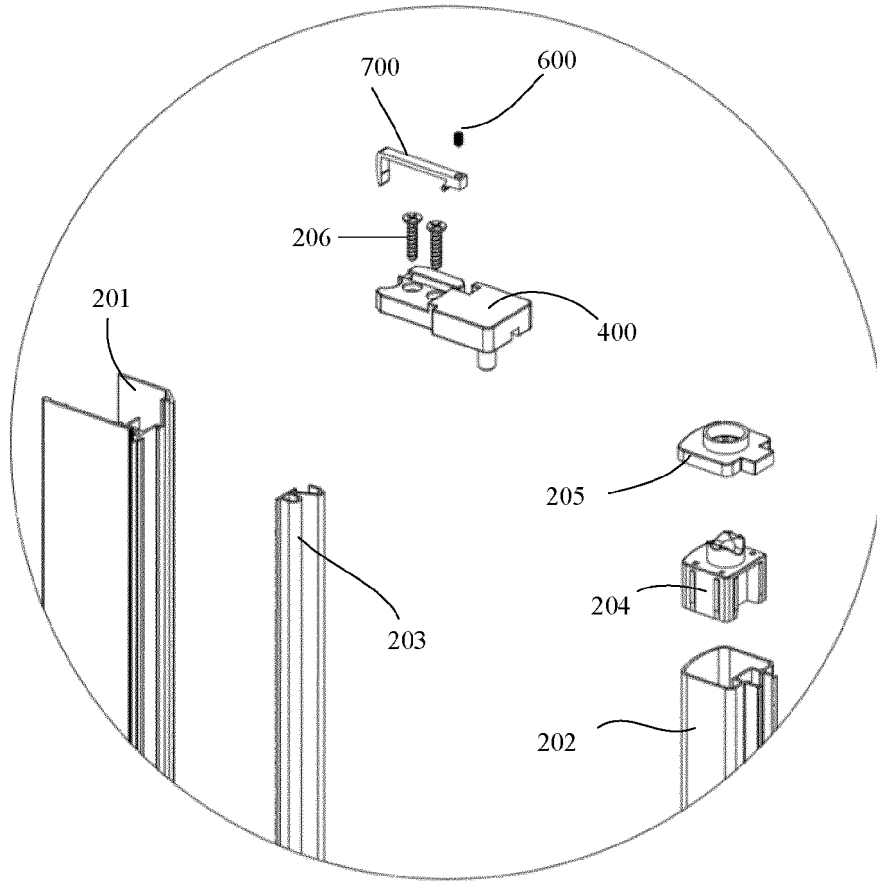


FIG. 5

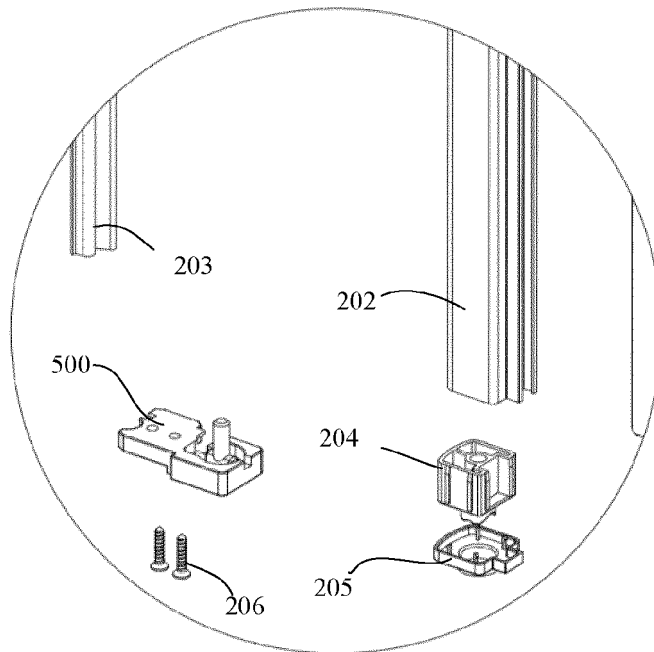


FIG. 6

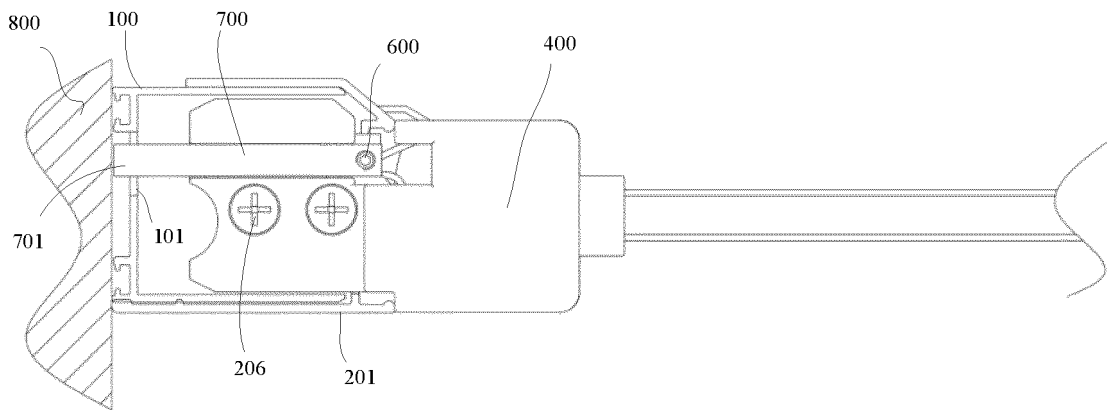


FIG. 7

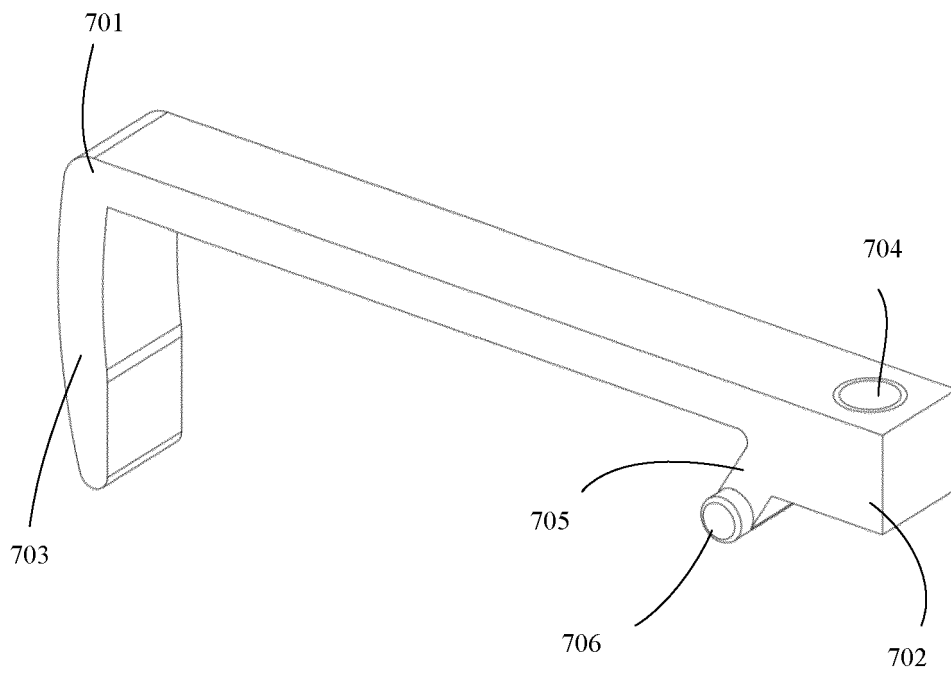


FIG. 8

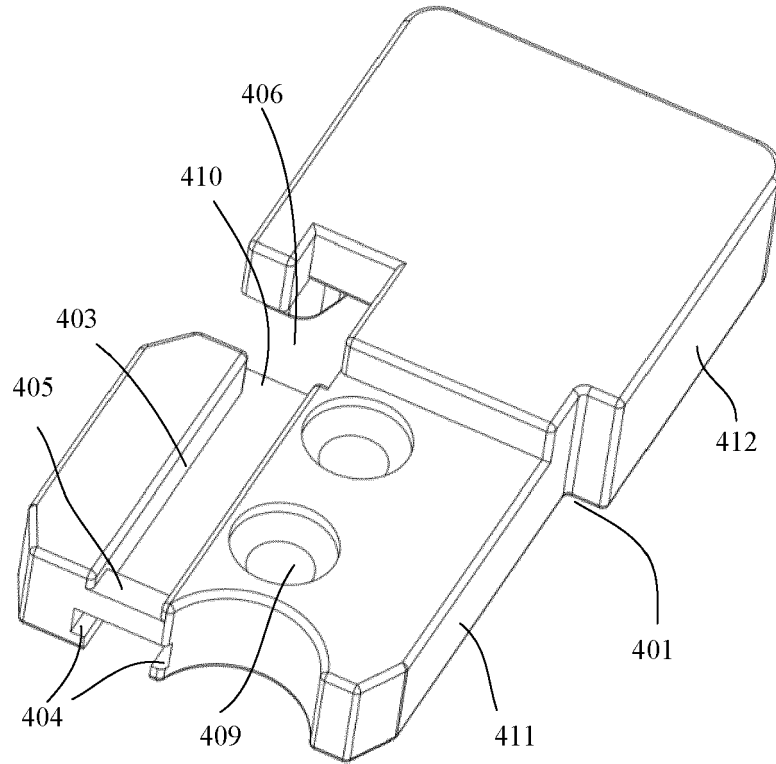


FIG. 9

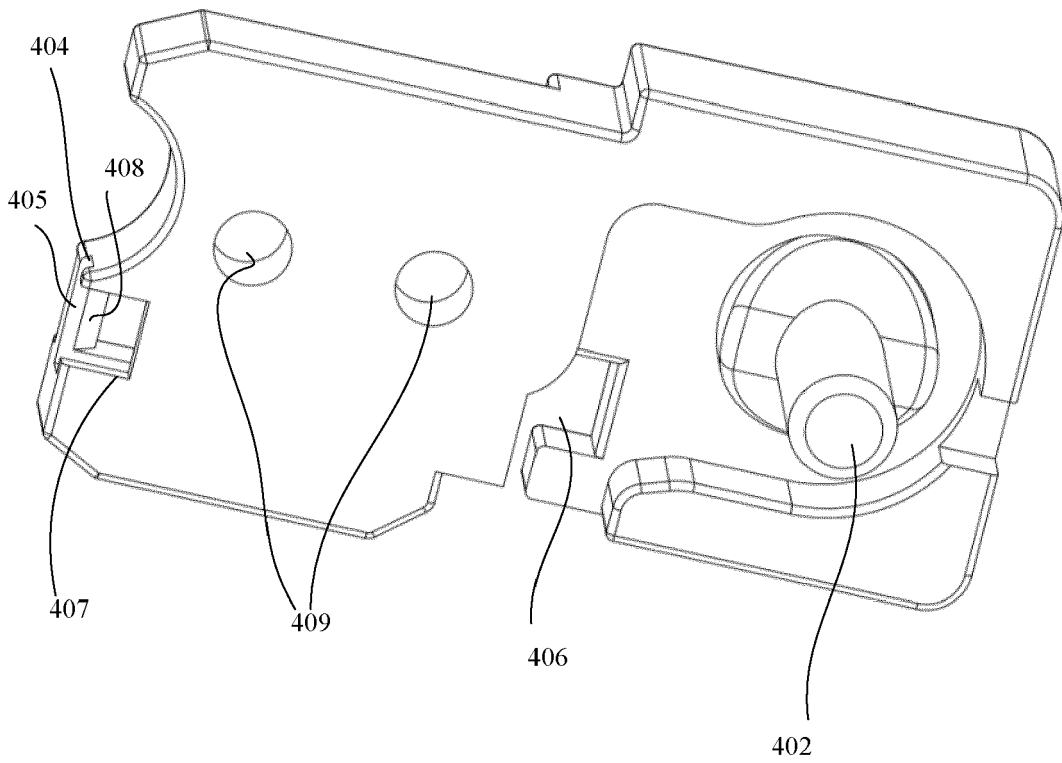


FIG. 10

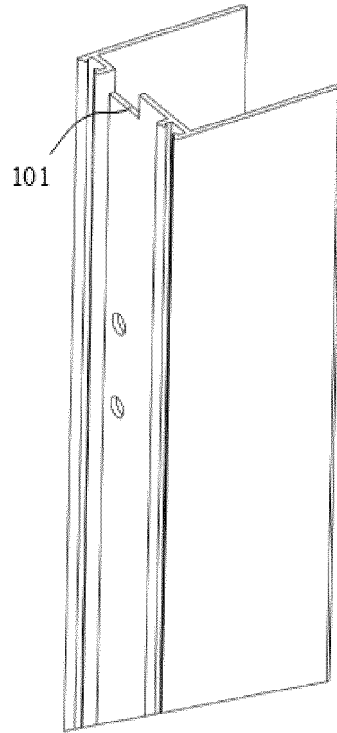


FIG. 11

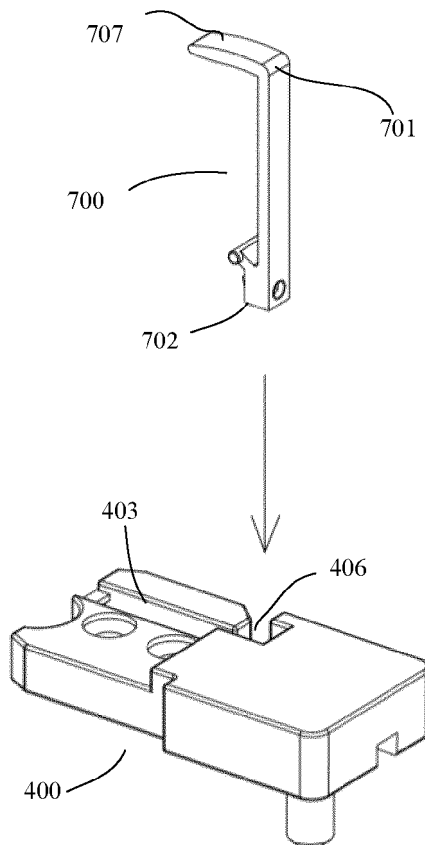


FIG. 12

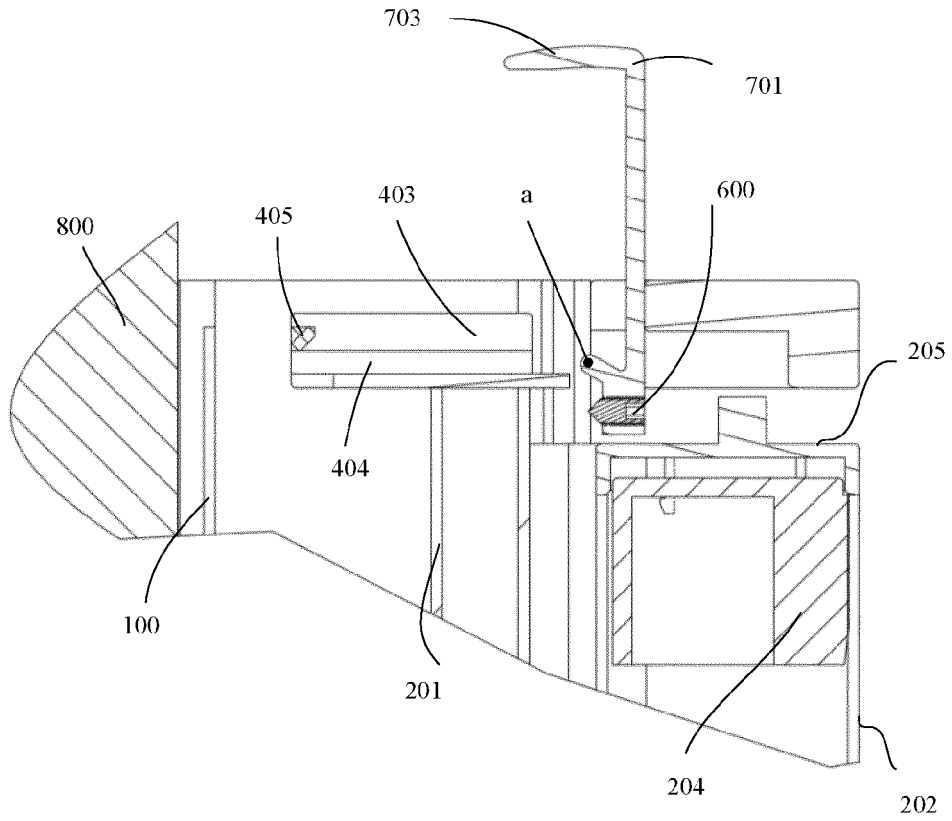


FIG. 13

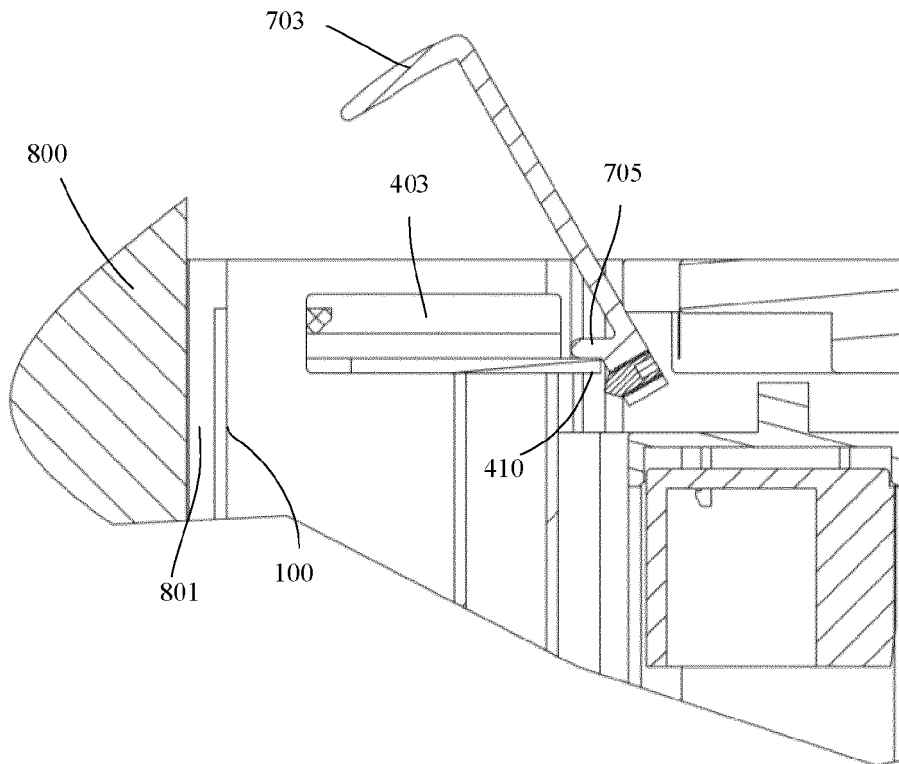


FIG. 14

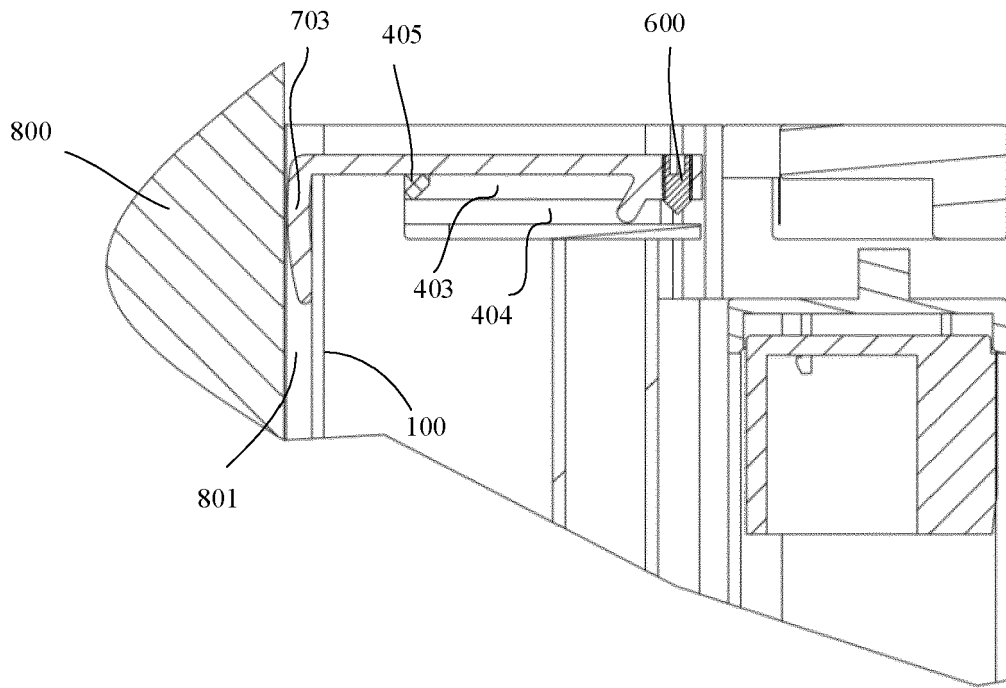


FIG. 15

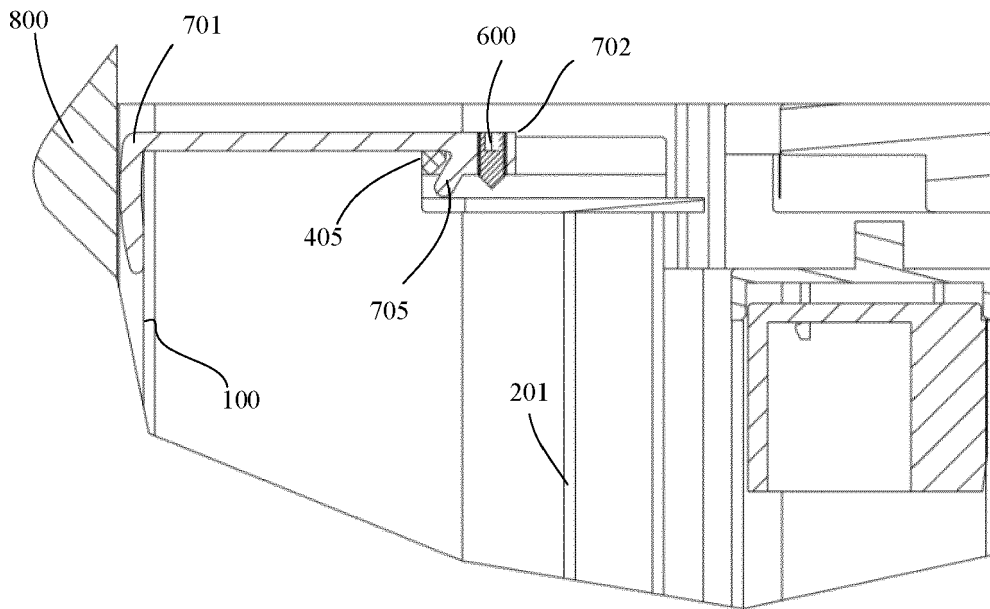


FIG. 16

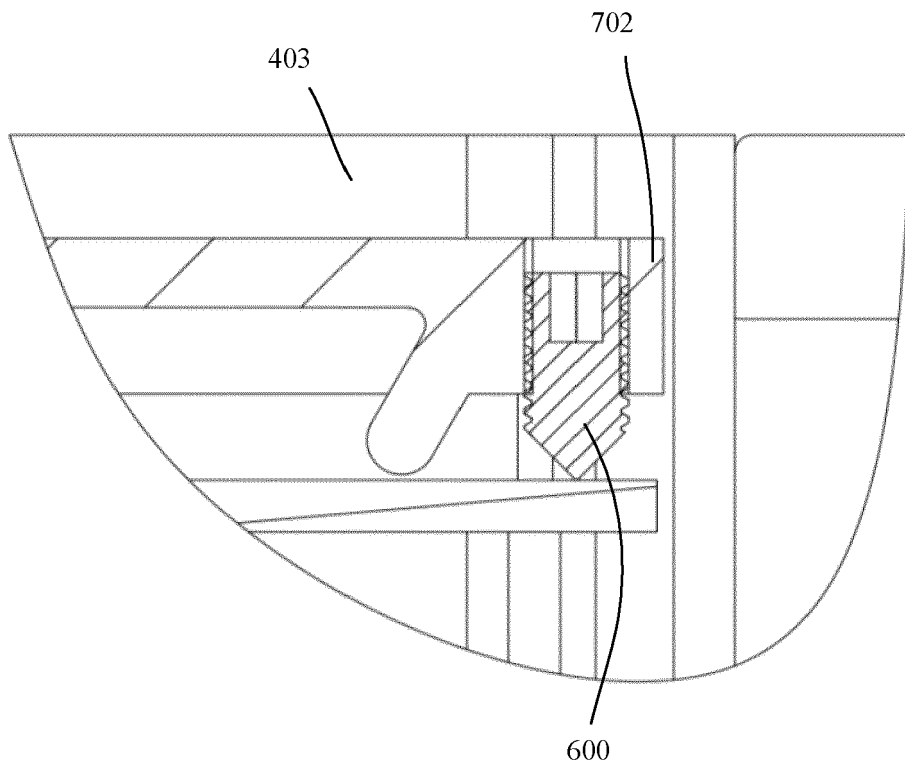


FIG. 17



EUROPEAN SEARCH REPORT

Application Number  
EP 20 20 2882

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X	EP 2 803 305 A1 (FOSHAN IDEAL CO LTD [CN]) 19 November 2014 (2014-11-19) * paragraph [0031] - paragraph [0045]; figures 1-11 * -----	1-4, 11-13, 15	
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			A47K E05G E05D
Place of search		Date of completion of the search	Examiner
The Hague		22 March 2021	Oliveras, Mariana
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X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.02 (P04C01)

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EP 20 20 2882

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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