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(54) SHOWER DOOR

(57) A shower door comprises a fixed component, a movable door (100), a closer (400), a clamping seat (102) and a fixed seat (206), the fixed component being fixedly mounted in a shower room, the movable door (100) being rotatable around a rotational shaft (101), and the closer (400) comprising a main body (401) and a sliding body (402) which penetrates through a first end of the main body and is extendable and retractable along a longitudinal direction of the main body; a second end of the main body (401) is fixedly connected with the movable door (100) through the clamping piece (102), an outer end of the sliding body (402) being hinged with the fixed seat (206), and the fixed seat (206) being fixedly connected with the fixed component; the distance from the position where the outer end of the sliding body (402) is hinged to the fixed seat (206) to the rotational shaft is smaller than the distance from the clamping seat (102) to the rotational shaft (101). The closing force of the closer (400) required when the movable door (100) of the shower door is closed is greatly reduced, so that the size of the closer (400) can be reduced.

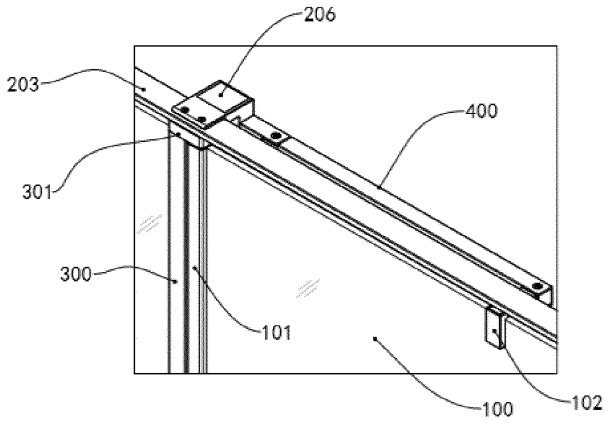

Fig.3

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Description

Technical field

[0001] The invention relates to the field of bathroom appliances, in particular to an open-close type shower door with an automatically closing door closing system, which is mounted in a shower room.

Background technology

[0002] At present, when people decorate, a shower room is usually arranged in a toilet, and the shower room usually uses a shower door with a glass sheet. The shower door comprises an open-close type shower door, and is generally provided with a side frame against a wall. The side frame can be made of metal, and the side frame is connected with a fixed glass sheet to realize fixed installation of the fixed glass sheet. A vertical frame is connected to the other side of the fixed glass sheet, or another vertical frame is set against the wall. One side of the movable glass sheet is provided with a vertical rotational shaft, and the rotational shaft is generally made of metal. In order to realize the rotation of the movable door, a metal rotational shaft on the movable door is usually leaned against one side of the fixed glass sheet with the vertical frame. A fixed rotational shaft seat is arranged at an upper end and a lower end of the vertical frame. The rotational shaft seat is matched with the metal rotational shaft. The fixed door and the movable door are connected into a whole, and the movable door can rotate around the rotational shaft, so that the movable door can be opened and closed. Typically the fixed glass sheet is referred to as a fixed door and the shower door comprises at least one movable glass sheet rotatable about the fixed glass sheet. Typically the movable glass sheet is referred to as a movable door.

[0003] An existing shower door is usually provided with an automatically closing door closing system. A common closer is provided, one end of the closer is connected with the movable door, and the other end of the closer is connected with a fixed position in the shower room, so that the movable door can be automatically closed. One end of the closer is fixedly connected with the movable door through a clamping piece, and the other end of the closer is rotatably connected with a fixed position. However, in this way, generally, the clamping piece connected with the movable door at one end of the closer is close to the rotational shaft of the movable door, and the rotating central shaft of the rotatable part at the other end is far away from the rotational shaft of the movable door, so that the movable door needs more closing force when closing the door, and a buffer with a larger size is needed to realize the function of the movable door.

[0004] In addition, when the existing closer is used on shower doors with different shapes, different fixed pieces need to be matched, and universality is poor in different installation occasions. The existing clamping piece is usually fixed through a lock screw abutting against the glass sheet, but when the shower door is opened and closed, the lock screw is easy to slip on the glass sheet, so that the automatic closing system fails. The existing clamping piece and the main body of the closer are connected by matching the lock nut with the countersunk head screw, and when the shower door is mounted in a left-right interchange mode, the part needs to be disassembled, so that the connection of the part is easy to be loose in use.

Summary of the invention

Technical problem

[0005] In order to solve the above problems, it is an object of the present invention to provide a shower door which reduces the closing force required when a movable door is closed.

Technical solution

[0006] In order to achieve the above object, the invention provides a shower door comprising a fixed component, a movable door, a closer, a clamping seat and a fixed seat, wherein the fixed component is fixedly mounted in a shower room, the movable door being rotatable around a rotational shaft, the closer comprising a main body and a sliding body which penetrates through a first end of the main body and is extendable and retractable along a longitudinal direction of the main body, and a second end of the main body being connected with the movable door through the clamping piece, an outer end of the sliding body being hinged with the fixed seat, and the fixed seat being fixedly connected with the fixed component; and the distance from the position where the outer end of the sliding body is hinged with the fixed seat to the rotational shaft is smaller than the distance from the clamping seat to the rotational shaft.

[0007] According to a further technical solution, the fixed seat comprises a fixed piece and an extension piece; the fixed piece comprising a first cavity with an opening, a fixed plate extending outwards from one side of the opening of the first cavity and a through hole arranged below a bottom of the first cavity, and the through hole penetrating through two sides of the fixed piece in a direction perpendicular to an extension direction of the fixed plate; the extension piece comprising an extension block and a projecting strip arranged at a first end of the extension block, and a second end of the extension block being hinged with the outer end of the sliding body; the fixed plate being fixedly connected with the fixed component through a first threaded fastener; the projecting strip extending into the through hole, and the fixed seat being fixedly connected with the projecting strip through a second threaded fastener penetrating through the bottom of the first cavity.

[0008] According to a further technical solution, a sec-

ond end of the extension block is provided with a second cavity, and the second cavity is provided with an opening communicated with a tail end of a second end and one side surface of the extension block; and the outer end of the sliding body extends into the second cavity and is hinged with the second cavity.

[0009] According to a further technical solution, the second cavity is hinged with the outer end of the sliding body through a bolt and a lock nut, or the second cavity is hinged with the outer end of the sliding body through a rivet; and a first decoration cover is arranged at the opening of the first cavity.

[0010] According to a further technical solution, the second end of the main body being provided with a third cavity; the clamping seat comprising a connecting block, a clamping plate and a cover plate; one side of the connecting block being provided with a projection, the projection extending into the third cavity to be connected with the third cavity, and the other side of the connecting block being provided with a fourth cavity which is symmetrical up and down; one side of the clamping plate being provided with a clamping table which is symmetrical up and down, the clamping table being matched and connected with the fourth cavity, and the other side of the clamping plate and the cover plate clamping the movable door.

[0011] According to a further technical solution, the projection is connected with the third cavity through a bolt and a lock nut, or the projection being connected with the third cavity through a rivet; a through hole or a notch being formed at a top end of the movable door, and the clamping plate, the movable door and the cover plate being fixedly connected through threaded pieces penetrating through the through hole or the notch.

[0012] According to a further technical solution,a first convex cover is arranged at a top end of the clamping plate, and a second convex cover being arranged at a top end of the cover plate; the first convex cover being connected with the second convex cover at an upper edge of the movable door; a gasket being arranged between the clamping plate and the movable door, and a gasket being also arranged between the cover plate and the movable door; and a second decoration cover being arranged on an outer side of the cover plate.

[0013] According to a further technical solution, the fixed component comprises a side frame and a rotational shaft seat arranged at an upper end and a lower end of the side frame, and the rotational shaft seat is hinged with the rotational shaft; and the fixed seat is fixedly connected to the upper end of the rotational shaft seat.

[0014] According to a further technical solution, the fixed component comprises a fixed door, a vertical frame, a pull rod and a wall seat; one side edge of the fixed door being connected with a wall through the vertical frame; the pull rod being arranged above the fixed door and being connected with the vertical frame and the wall through the wall seat; and the fixed seat is fixed at an upper end or a lower end of the pull rod.

[0015] According to a further technical solution, the fixed component comprises a fixed door, a vertical frame, a pull rod, a wall seat, a side frame and a rotational shaft seat arranged at an upper end and a lower end of the side frame; one side edge of the fixed door being connected with a wall through the vertical frame; the rotational shaft seat being hinged with the rotational shaft; the pull rod being arranged above the fixed door and above a closed position of the movable door, the pull rod being connected with the vertical frame and the wall through the wall seat, and being connected with the upper end of the rotational shaft seat; and the fixed seat is fixed at an upper end of the pull rod at the upper end of the rotational shaft seat, or the fixed seat is fixed at an upper end or a lower end of the pull rod above the closed position of the movable door.

Beneficial effect

[0016] The clamping seat of the switch type shower door is positioned at the far end of the rotational shaft of the movable door. The rotational position of the slider of the closer is positioned at the near end of the rotational shaft of the movable door, and the closing force of the closer required when the movable door is closed is greatly reduced, so that the size of the closer can be reduced.

[0017] The invention can be applied to shower doors with different shapes by adopting the same parts, or can be applied to shower doors with U-shaped shapes and the like by appropriately changing the structure of the individual parts within the protection scope of the invention. Meanwhile, the closer can be suitable for installation of the same set of shower doors in different directions. The connecting block of the clamping seat is fixedly connected with the main body of the closer. The connecting block does not need to be disassembled after being connected. The connecting block and the main body need to be exchanged up and down when the position of the movable door needs to be exchanged left and right, the connecting block and the main body are matched and connected with the cavity of the connecting block through a clamping plate clamping table which is symmetrical up and down, and the connecting part of the connecting block and the main body does not need to be disassembled. The extension piece of the fixed seat and the outer end of the sliding body of the closer can also be assembled and connected in advance. Disassembly is not needed during installation. The extension piece can be inserted into the left-right through hole of the fixed piece when the position of the movable door needs to be interchanged left and right. Connection failure caused by repeated disassembly and assembly of connection parts at two ends of the closer is avoided, and installation appearance and functions are not influenced.

[0018] The movable door is clamped by the clamping seat. A through hole or a notch is formed in the movable door. The movable door and the clamping plate and the cover plate of the clamping seat are connected by the

threaded piece, and the problem that the lock screw is easy to slide when abutting against the glass movable door is solved.

[0019] The closer is mounted on the top of the movable door and is convenient to mount and dismount. The second end of the body and the outer end of the sliding body are connected with the clamping seat and the fixed seat through the top nut, the bottom nut and the middle stud, so that the closer can freely rotate at a certain angle relative to the clamping seat and the fixed seat when moving, and the closer cannot be stuck when the sliding piece slides.

Brief description of the drawings

[0020]

Fig. 1 is a schematic view showing a structure of a first embodiment of a shower door of the present invention when the movable door is closed.

Fig. 2 is a schematic view showing the structure of the first embodiment of the shower door of the present invention when the movable door is opened.

Fig. 3 is a schematic view of a partially enlarged structure at A circled in Fig. 1.

Fig. 4 is a schematic view of the structure of Fig. 3 with the pull rod sectioned.

Fig. 5 is a schematic view showing a structure of the first embodiment of the shower door of the present invention in which the closer is connected to the fixed seat and the clamping seat when the movable door is closed.

Fig. 6 is a schematic view showing a structure of the first embodiment of the shower door of the present invention in which the closer and the fixed seat and the clamping seat are connected at another angle when the movable door is closed.

Fig. 7 is a schematic view showing a structure of the first embodiment of the shower door of the present invention in which the closer is connected to the fixed seat and the clamping seat when the movable door is opened.

Fig. 8 is an exploded view showing a structure of the first embodiment of the shower door of the present invention in which the closer is connected to the fixed seat and the clamping seat.

Fig. 9 is an exploded view showing a structure of the first embodiment of the shower door of the present invention in which the clamping seat is connected to the movable door.

FIG. 10 is an exploded view of a portion of the structure of a first embodiment of a shower door of the present invention in which the closer is connected to the fixed seat and clamping seat in a first manner.

FIG. 11 is an exploded view of a portion of the structure of a first embodiment of the shower door of the present invention in which the closer is connected to the fixed seat and clamping seat in a second manner.

Fig. 12 is a schematic view showing the structure of a second embodiment of the shower door of the present invention.

Fig. 13 is a schematic view showing the structure of a third embodiment of the shower door of the present invention.

Fig. 14 is a schematic view showing the structure of a fourth embodiment of the shower door of the present invention.

Fig. 15 is a schematic view showing the structure of a fifth embodiment of the shower door of the present invention.

Fig. 16 is a schematic view showing the structure of a sixth embodiment of the shower door of the present invention.

[0021] The invention is further illustrated by the following figures and examples.

Detailed embodiment of the invention

First embodiment

[0022] As shown in FIGs. 1 and 2, the switch-type shower door of the present embodiment is mounted in a shower room and includes a movable door 100, a first fixed door 200, and a second fixed door 201. In the present embodiment, the movable door 100, the first fixed door 200, and the second fixed door 201 are glass doors or doors made of other materials. One vertical side of the first fixed door 200 is connected to the wall through a vertical frame 202, and a vertical side edge of the second fixed door 201 is also connected to the wall through another vertical frame 202. The other vertical side edge of the first fixed door 200 is also provided with a vertical side frame 300, and the side frame 300 is hinged with the movable door 100 to realize the rotation of the movable door 100. Specifically, a rotational shaft seat 301 is fixed at an upper end and a lower end of the side frame 300, a rotational shaft 101 is arranged on one vertical side edge of the movable door 100, and the two ends of the rotational shaft 101 are matched with the upper rotational shaft seat 301 and the lower rotational shaft seat

301, so that the rotational shaft 101 can rotate between the upper rotational shaft seat 301 and the lower rotational shaft seat 301 around an axis thereof to drive the movable door 100 to rotate around, thereby realizing the opening and closing of the movable door 100. The rotational shaft 101 can be matched with the rotational shaft seat 301 through a convex shaft to be matched with a hinge hole or can be rotatably connected through a threaded part or the like. Preferably, a waterproof seal is provided between the rotational shaft 101 and the side frame 300. As shown in Fig. 1, when the movable door 100 is closed, the movable door 100 is in the same plane as the first fixed door 200 and is perpendicular to the second fixed door 201. As shown in Fig. 2, when the movable door 100 is opened, the movable door 100 is rotated about the rotation axis 101 to a position perpendicular to the first fixed door 200.

[0023] A pull rod 203 is further arranged above the first fixed door 200 and the second fixed door 201, and a tail end of the pull rod 203 is connected with a wall and a vertical frame 202 through a wall seat 204, so that the pull rod 203 is fixed in the shower room. The pull rod 203 above the first fixed door 200 is fixedly connected with the rotational shaft seat 301, and the pull rod 203 above the second fixed door 201 is fixedly connected with the second fixed door 201 through the clamping piece 205. The pull rod 203 also extends along an upper edge of the first fixed door 200, intersecting the pull rod 203 on the second fixed door 201. When the movable door 100 is closed, the pull rod 203 is positioned above the movable door 100.

[0024] The shower door of this embodiment further includes a closer 400 located inside the shower door. As shown in FIGs. 3 to 4, one end of the closer 400 is fixedly mounted on a top end of the movable door 100 through the clamping seat 102, and the other end of the closer 400 is mounted on the pull rod 203 above the rotational shaft seat 301 through the fixed seat 206. One end of the closer 400 connected to the clamping seat 102 is further away from the rotational shaft 101 than the other end of the closer 400 connected to the fixed seat 206.

[0025] As shown in FIGs. 5 to 7, the closer 400 includes a bar-shaped main body 401 and a bar-shaped sliding body 402 which sliding body 402 penetrates out from a first end of the main body 401 and can stretch and contract along a longitudinal direction of the main body 401. The main body 401 has a damper therein, and the sliding body 402 has a function of automatically retracting into the main body 401, thereby realizing automatic closing of the movable door 100.

[0026] As shown in Fig. 8, the fixed seat 206 includes a fixed piece 207 and an extension piece 208. The fixed piece 207 comprises a first cavity 209 with an upward opening and a fixed plate 210 extending outwards along the opening side of the first cavity 209, wherein a tail end of the fixed plate 210 is provided with a first through hole 211, and a first threaded fastener 212 penetrates through the first through hole 211 to fix the fixed plate 210 on a pull rod 203 at the upper end of the rotational shaft seat 301. In this embodiment, the first threaded fastener 212 is a screw. A through hole 213 is formed in a lower end of the fixed piece 207, openings are formed in both sides of the fixed piece 207 perpendicular to the extension direction of the fixed plate 210, and a second through hole 214 is formed in the bottom of the first cavity 209 to communicate with the through hole 213.

[0027] The extension piece 208 comprises an extension block 215, wherein one end of the extension block 215 is provided with a projecting strip 216, wherein the projecting strip 216 is provided with a first threaded hole 217, the projecting strip 216 extends into the through hole 213, and a second threaded fastener 218 is fixedly connected with the first threaded hole 217 through a second through hole 214 at the bottom of the first cavity 209. In this embodiment, the second threaded fastener 218 is a bolt. In the embodiment, the projecting strip 216 is square, and the through hole 213 is square. The projecting strip 216 is matched with the through hole 213, and the projecting strip 216 is prevented from rotating in the through hole 213. The installation is convenient, and the structure is stable after the installation. The other end of the extension block 215 is also provided with a second cavity 219, the second cavity 219 is provided with an opening communicated with the end face of the end of the extension block 215 and the side face adjacent to the end face close to the fixed plate 210, and an upper wall and a lower wall of the second cavity 219 are provided with third through holes 220. The outer end of the sliding body 402 of the closer 400 is provided with a fourth through hole 403. The outer end of the sliding body 402 protrudes into the second cavity 219. A third threaded fastener 221 passes through a third through hole 220 and a fourth through hole 403 to hinge the second cavity 219 with the outer end of the sliding body 402, and the outer end of the sliding body 402 can rotate around the third threaded fastener 221 at an angle range at the opening of the second cavity 219. In this embodiment, the third threaded fastener 221 includes a stud and a lock nut. The third threaded fastener 221 may also be replaced with a rivet. In this embodiment, the sliding body 402 has a square shape, the second cavity 219 has a square shape, and a tail end of the sliding body 401 is fitted with the second cavity 219 to facilitate assembly.

[0028] As shown in FIGs. 5 to 6, when the movable door 100 is in the closed state, the sliding body 402 is retracted into the main body 401, and the closer 400 is in line with the extension piece 208. When the movable door 100 is rotated open, the outer end of the sliding body 402 is rotated within the second cavity 219, while the sliding body 402 extends out of the main body 401, as shown in Fig. 7, until the movable door 100 is fully opened, the sliding body 402 being substantially perpendicular to the extension piece 208.

[0029] A second end of the main body 401 of the closer 400 is connected to the clamping seat 102. As shown in Fig. 8, a second end of the main body 401 is provided

with a third cavity 404 which is provided with an opening at a side surface of a second end of the main body 401, and upper and lower walls of the third cavity 404 are provided with a fifth through hole 405.

[0030] As shown in FIGs. 8 to 9, the clamping seat 102 includes a connecting block 103, a clamping plate 104, and a cover plate 105. In this embodiment, the clamping plate 104 and the cover plate 105 may be of a metal material. One end of the connecting block 103 is provided with a projection 106, and the projection 106 is provided with a sixth through hole 107. The projection 106 extends into the third cavity 404 at the second end of the main body 401, and the fourth threaded fastener 108 extends through the fifth through hole 405 and the sixth through hole 107 to connect the connecting block 103 to the second end of the main body 401. Alternatively, the projection 106 may be secured to the third cavity 404 using glue. In this embodiment, the fourth threaded fastener 108 includes a stud and a lock nut. The fourth threaded fastener 108 may also be replaced with a rivet.

[0031] As shown in Fig. 9, the other end of the connecting block 103 is further provided with a fourth cavity 109, the opening of the fourth cavity 109 is provided at the end of the other end of the connecting block 103, and a second threaded hole 110 is provided in the middle of a bottom of the fourth cavity 109. An upper end of one side of the clamping plate 104 is provided with a clamping table 111. A top end of the other side of the clamping plate 104 is provided with a first convex cover 112, the upper end of the clamping plate 104 is provided with a seventh through hole 113 penetrating through the middle of the clamping table 111, and the lower end of the clamping plate 104 is provided with a third threaded hole 114. The clamping table 111 extends into the fourth cavity 109, and the fifth threaded fastener 115 is connected to the second threaded hole 110 at the bottom of the fourth cavity 109 through the seventh through hole 113, thereby fixedly connecting the clamping plate 104 with the connecting block 103. In this embodiment, the fifth threaded fastener 115 is a bolt. In this embodiment, the clamping table 111 has a square shape and the fourth cavity 109 has a square shape, and the clamping table 111 cooperates with the fourth cavity 109. The first convex cover 112 is also provided with a fourth threaded hole 116.

[0032] As shown in Fig. 9, a top end of one side of the cover plate 105 is provided with a second convex cover 117, and the second convex cover 117 is provided with an eighth through hole 118. The lower end of the cover plate 105 is further provided with a ninth through hole 119. The movable door 100 is clamped between the clamping plate 104 and the cover plate 105. The upper end of the movable door 100 is provided with a tenth through hole 120. The sixth threaded fastener 121 passes through the ninth through hole 119,and is connected with the tenth through hole 120 and the third threaded hole 114, and fixedly connects the clamping plate 104, the movable door 100 and the cover plate 105. The tenth through hole 120 at the upper end of the movable door 100 may also be replaced with a notch. Gaskets 122 are respectively arranged between the clamping plate 104 and the movable door 100 and between the movable door 100 and the cover plate 105, and the gaskets 122 can be made of plastic materials, so that the movable door 100 is prevented from being damaged by direct contact with the clamping plate 104 and the cover plate 105 made of metal materials. The first convex cover 112 abuts the second convex cover 117 at an upper edge of the movable door 100, and the seventh threaded fastener 123 is connected to the fourth threaded hole 116 of the first convex cover 112 through the eighth through hole 118 of the second convex cover 117 to prevent the clamping seat 102 from rotating relative to the movable door 100. In this embodiment, the sixth threaded fastener 121 is a bolt and the seventh threaded fastener 123 is a bolt or screw.

[0033] As shown in FIGs. 10 through 11, the fitting of the fixed seat 206, the clamping seat 102 and the closer 400 of the present embodiment is suitable for mounting in different scenes. Before installation, the second cavity 219 of the extension piece 208 is preassembled and connected with a tail end of the sliding body 402 of the closer 400, and the connecting block 103 is preassembled and connected with the third cavity 404 of the second end of the main body 401 of the closer 400. Disassembly is not needed when the shower door is mounted, and connection failure caused by repeated disassembly is avoided. When the movable door 100 is used in the manner shown in Fig. 1, from the perspective of Fig. 1, the movable door 100 is positioned on the right side of the side frame 300, and the fixed seat 206 is positioned on the left side of the closer 400, and the clamping seat 102 is positioned on the right side of the closer 400 to be mounted, that is, the fixed seat 206, the clamping seat 102 and the closer 400 need to be connected in a first manner as shown in Fig. 10. The extension piece 208, the connecting block 103, and the closer 400 will now be pre-assembled and connected, to place the extension piece 208 on the left side of the closer 400 and the connecting block 103 on the right side of the closer 400, fixing the projecting strip 216 of the extension piece 208 extending into the right side of the through hole 213, mounting and fixing the clamping table 111 of the clamping plate 104 towards the fourth cavity 109 of the connecting block 103, mounting the fixed plate 210 on the pull rod 203, and mounting the clamping plate 104, the cover plate 105 or the like on the top end of the movable door 100. When the movable door 100 is used in another way, from the perspective of Fig. 1, when the movable door 100 is positioned on the left side of the side frame 300, the fixed seat 206 needs to be positioned on the right side of the closer 400, and the clamping seat 102 is positioned on the left side of the closer 400, that is, the fixed seat 206, the clamping seat 102 and the closer 400 need to be connected in a second way as shown in Fig. 11. At this time, the extension piece 208, the connecting block 103 and the closer 400 will now be pre-assembled and connected, to place the extension

piece 208 on the right side of the closer 400, the connecting block 103 on the left side of the closer 400, fixing the projecting strip 216 of the extension piece 208 extending into the left side of the through hole 213, mounting and fixing the clamping table 111 of the clamping plate 104 towards the fourth cavity 109 of the connecting block 103, and mounting the fixed plate 210 on the pull rod 203 to fix the clamping plate 104, the cover plate 105 or the like to the top end of the movable door 100. That is, the projecting strip 216 of the extension piece 208 and the through hole 213 of the fixed piece 207 can be exchanged and assembled leftwards and rightwards, and the fourth cavity 109 of the connecting block 103 and the clamping table 111 of the clamping plate 104 can be exchanged and assembled upwards and downwards, so that the closer 400 can be mounted in shower doors in different directions, without disassembling the connecting part of the extension piece 208 to the sliding body 402 of the closer 400 and the lock nut and stud at the connecting part of the connecting block 103 to the main body 401 of the closer 400.

[0034] As shown in FIGs. 8 to 9, the fixed piece 207 further includes a first decoration cover 222 for covering the opening of the first cavity 209. The clamping seat 102 further includes a second decoration cover 124 for covering the outside of the cover plate 105. In addition to the first decoration cover 222 and the second decoration cover 124 serving a decoration function, the first decoration cover 222 and the second decoration cover 124 can prevent dust from being deposited or water vapor from entering the portions covered by the first decoration cover 222 and the second decoration cover 124.

[0035] In use of the shower door of the present embodiment, since the clamping seat 102 is located at a distal end of the rotational shaft 101 of the movable door 100, and the position of the fourth through hole 403 in which the sliding body 401 of the closer 400 rotates is located at a proximal end of the rotational shaft 101 of the movable door 100, the closing force of the closer 400 required when the movable door 100 is closed is greatly reduced, so that the size of the closer 400 can be reduced.

Second embodiment

[0036] As shown in Fig. 12, in the second embodiment, the shower door does not include the first fixed door 200, the side frame 300 is directly fixed to the wall, and the remaining components are the same as those of the first embodiment, and the object of the present invention can be achieved.

Third embodiment

[0037] As shown in Fig. 13, in the third embodiment, the fixed seat 206 is mounted above the pull rod 203 away from the rotational shaft seat 301, and the remaining components are the same as those of the first embodiment, so long as the sliding body 402 is closer to the rotational shaft 101 with respect to the clamping seat 102 at the hinge joint with the extension piece 208, and the object of the present invention is also achieved.

Fourth embodiment

[0038] As shown in Fig. 14, in the fourth embodiment, the fixed seat 206 is mounted below the pull rod 203 away from the rotational shaft seat 301, and the remaining components are the same as those of the first embodiment, so long as the sliding body 402 is closer to the rotational shaft 101 with respect to the clamping seat 102 at the hinge joint with the extension piece 208, and the object of the present invention can also be achieved.

Fifth embodiment

[0039] As shown in Fig. 15, in the fifth embodiment, when the movable door 100 is closed, the movable door 100 is perpendicular to the first fixed door 200 and the second fixed door 201, and the movable door 100, the first fixed door 200 and the second fixed door 201 form a U-shaped shower door, and the pull rods 203 above the movable door 100, the first fixed door 200 and the second fixed door 201 are connected in a U-shape. One side of the fixed seat 206 is fixed on the pull rod 203 above the first fixed door 200, a clamping opening is arranged below the other side of the fixed seat 206 and hinged with the outer end of the sliding body 402, and the other parts are the same as those of the first embodiment, so that the purpose of the invention can be achieved. Alternatively, the structure of the fixed seat 206 is not changed, the extension piece 208 still extends into the through hole 213, and the opening of the second cavity 219 is arranged at the end face of the tail end of the extension block 215 and the side face adjacent to the end face away from the fixed plate 210. In the second cavity, the closer 400 is perpendicular to the extension piece 208 when the movable door 100 is closed, and is aligned with the extension piece 208 when the movable door 100 is opened, so that the purpose of the invention can be achieved.

Sixth embodiment

[0040] As shown in Fig. 16, in the sixth embodiment, the shower door does not include a pull rod, the fixed seat 206 is directly mounted on the rotational shaft seat 301 of the side frame 300, and the remaining components are the same as those of the first embodiment, and the object of the present invention can be achieved.

[0041] Of course, the above-described embodiments are only preferred embodiments of the present invention, and when actually applied to a shower room, the same components as those of the above embodiments can be used without changing any parts, or with only changing individual parts, to achieve the object of the present in-

vention.

Industrial applicability

[0042] As can be seen from the movement process of the switch-type shower door, the structure of the shower door is more reasonable in mechanics, the same function can be realized by the buffer with smaller size and force, and the structure is simpler, so that the manufacturing cost and difficulty can be saved. Meanwhile, the appearance is more attractive.

[0043] The components used by the shower door are advantageous in universality on different shower doors, wider in application range and small in assembly difficulty. The connecting structure of the two ends of the closer is not influenced by replacement. The failure of the connection part of the two ends of the closer due to frequent disassembly and assembly is avoided. The replacement is easy, the shower door can be assembled and replaced on site in a shower room, and the use requirements of different occasions can be met.

Claims

1. A shower door comprising a fixed component, a movable door, a closer, a clamping seat and a fixed seat, wherein the fixed component is fixedly mounted in a shower room, the movable door being rotatable around a rotational shaft, the closer comprising a main body and a sliding body which penetrates through a first end of the main body and is extendable and retractable along a longitudinal direction of the main body, and a second end of the main body being connected with the movable door through the clamping piece, an outer end of the sliding body being hinged with the fixed seat, and the fixed seat being fixedly connected with the fixed component; **characterized in that**:
   the distance from the position where the outer end of the sliding body is hinged with the fixed seat to the rotational shaft is smaller than the distance from the clamping seat to the rotational shaft.

2. The shower door of claim 1, **characterized by**:

   the fixed seat comprising a fixed piece and an extension piece;
   the fixed piece comprising a first cavity with an opening, a fixed plate extending outwards from one side of the opening of the first cavity and a through hole arranged below a bottom of the first cavity, and the through hole penetrating through two sides of the fixed piece in a direction perpendicular to an extension direction of the fixed plate;
   the extension piece comprising an extension block and a projecting strip arranged at a first end of the extension block, and a second end of the extension block being hinged with the outer end of the sliding body;
   the fixed plate being fixedly connected with the fixed component through a first threaded fastener; the projecting strip extending into the through hole, and the fixed seat being fixedly connected with the projecting strip through a second threaded fastener penetrating through the bottom of the first cavity.

3. The shower door of claim 2, **characterized in that**: a second end of the extension block is provided with a second cavity, and the second cavity is provided with an opening communicated with a tail end of a second end and one side surface of the extension block; and the outer end of the sliding body extends into the second cavity and is hinged with the second cavity.

4. The shower door of claim 3, **characterized in that**:

   the second cavity is hinged with the outer end of the sliding body through a bolt and a lock nut, or the second cavity is hinged with the outer end of the sliding body through a rivet; and
   a first decoration cover is arranged at the opening of the first cavity.

5. The shower door of claim 1, **characterized by**:

   the second end of the main body being provided with a third cavity;
   the clamping seat comprising a connecting block, a clamping plate and a cover plate;
   one side of the connecting block being provided with a projection , the projection extending into the third cavity to be connected with the third cavity, and the other side of the connecting block being provided with a fourth cavity which is symmetrical up and down;
   one side of the clamping plate being provided with a clamping table which is symmetrical up and down, the clamping table being matched and connected with the fourth cavity, and the other side of the clamping plate and the cover plate clamping the movable door.

6. The shower door of claim 5, **characterized by**:

   the projection being connected with the third cavity through a bolt and a lock nut, or the projection being connected with the third cavity through a rivet;
   a through hole or a notch being formed at a top end of the movable door, and the clamping plate, the movable door and the cover plate being fixedly connected through threaded pieces pene-

trating through the through hole or the notch.

7. The shower door of claim 5, **characterized by**:

a first convex cover being arranged at a top end of the clamping plate, and a second convex cover being arranged at a top end of the cover plate;
the first convex cover being connected with the second convex cover at an upper edge of the movable door;
a gasket being arranged between the clamping plate and the movable door, and a gasket being also arranged between the cover plate and the movable door;
and a second decoration cover being arranged on an outer side of the cover plate.

8. The shower door of claim 1, **characterized in that**:

the fixed component comprises a side frame and a rotational shaft seat arranged at an upper end and a lower end of the side frame, and the rotational shaft seat is hinged with the rotational shaft; and
the fixed seat is fixedly connected to the upper end of the rotational shaft seat.

9. The shower door of claim 1, **characterized in that**:

the fixed component comprises a fixed door, a vertical frame, a pull rod and a wall seat; one side edge of the fixed door being connected with a wall through the vertical frame; the pull rod being arranged above the fixed door and being connected with the vertical frame and the wall through the wall seat; and
the fixed seat is fixed at an upper end or a lower end of the pull rod.

10. The shower door of claim 1, **characterized in that**:

the fixed component comprises a fixed door, a vertical frame, a pull rod, a wall seat, a side frame and a rotational shaft seat arranged at an upper end and a lower end of the side frame; one side edge of the fixed door being connected with a wall through the vertical frame; the rotational shaft seat being hinged with the rotational shaft;
the pull rod being arranged above the fixed door and above a closed position of the movable door, the pull rod being connected with the vertical frame and the wall through the wall seat, and being connected with the upper end of the rotational shaft seat; and
the fixed seat is fixed at an upper end of the pull rod at the upper end of the rotational shaft seat, or the fixed seat is fixed at an upper end or a lower end of the pull rod above the closed position of the movable door.

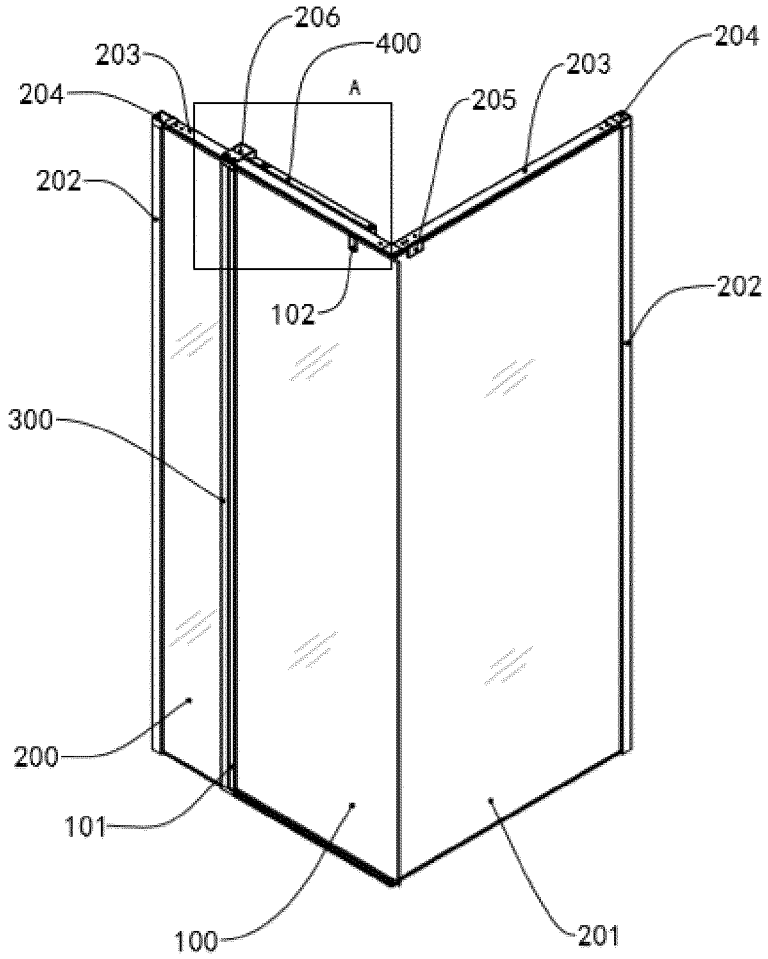

Fig.1

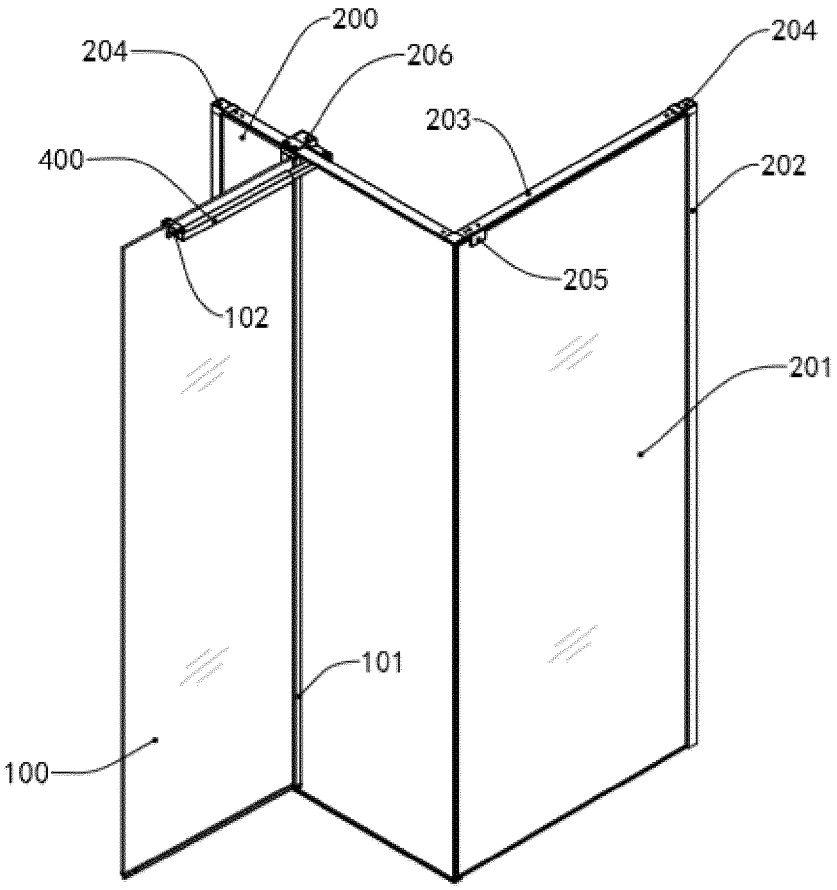

Fig.2

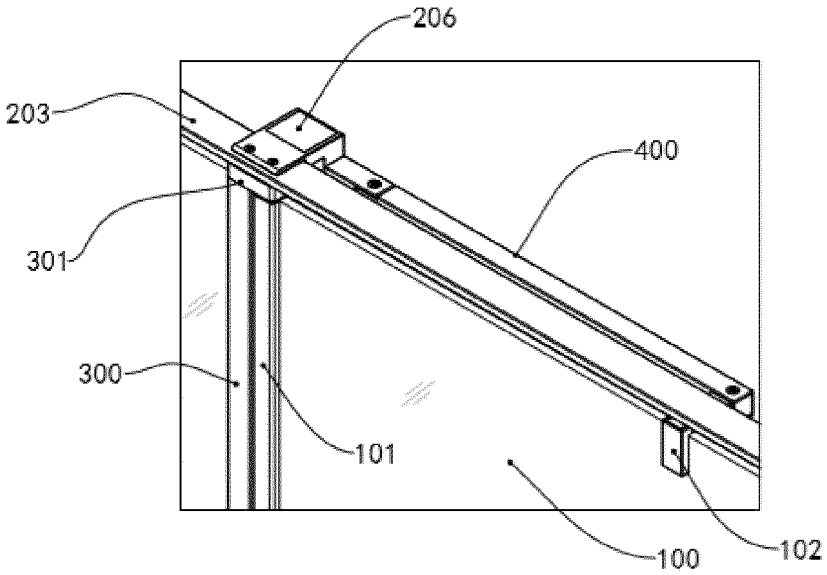

Fig.3

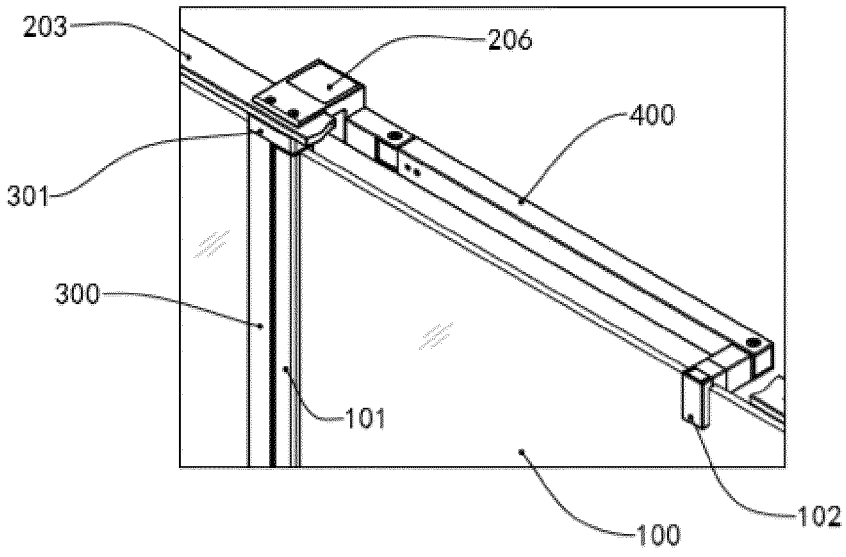

Fig.4

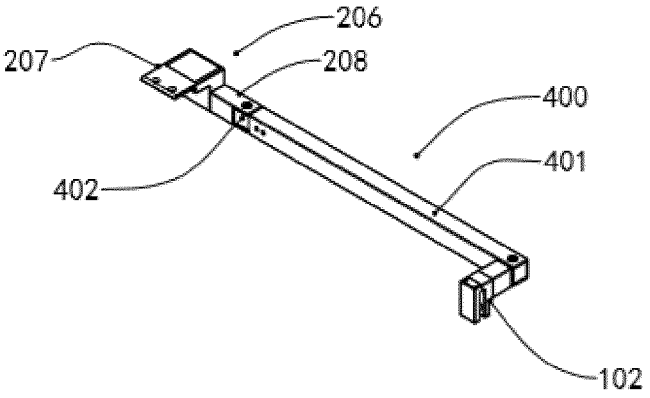

Fig.5

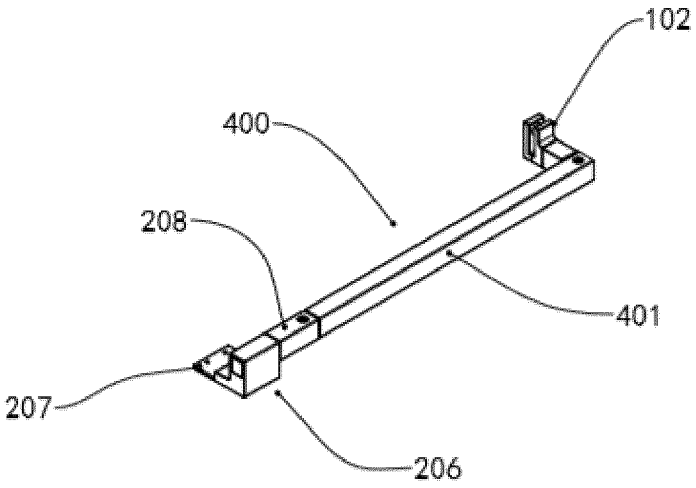

Fig.6

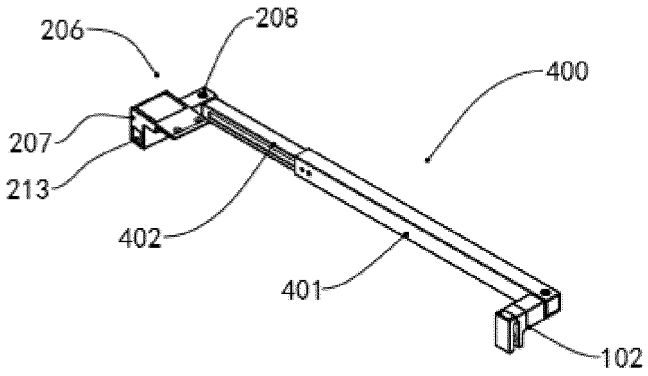
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Fig.7

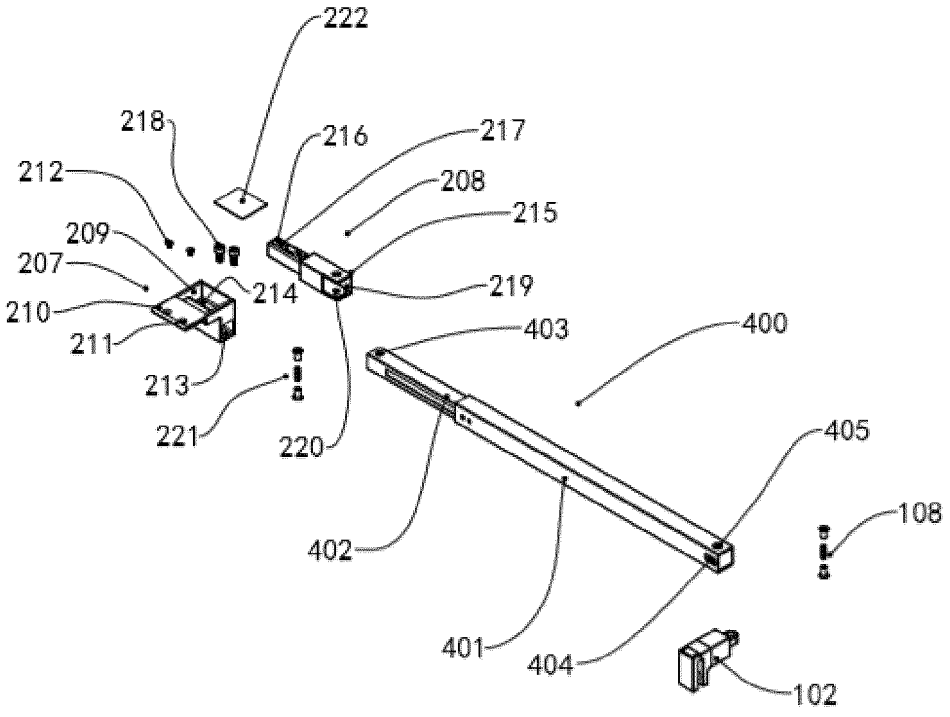
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Fig.8

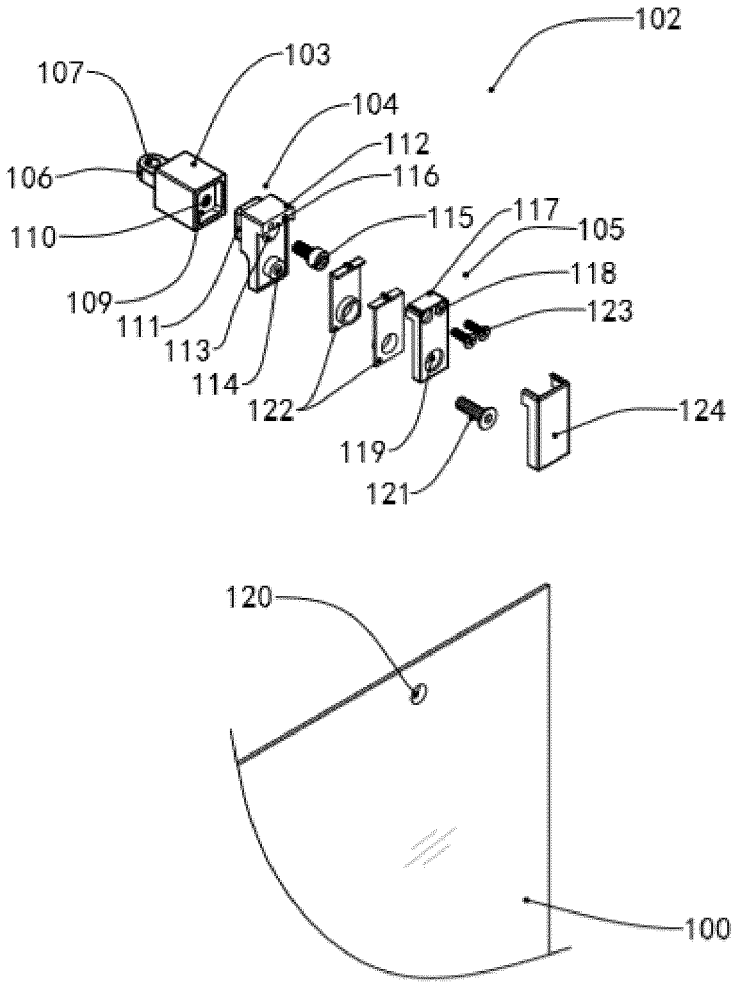
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Fig.9

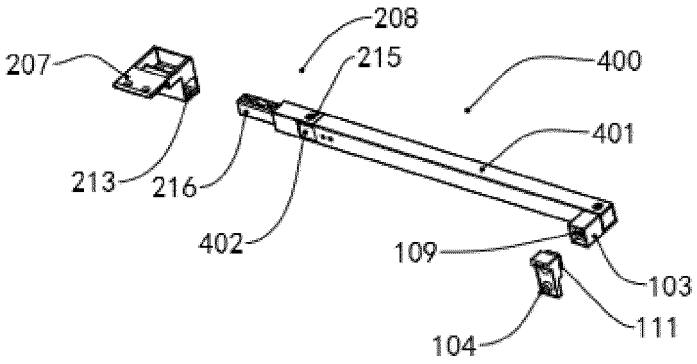
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Fig.10

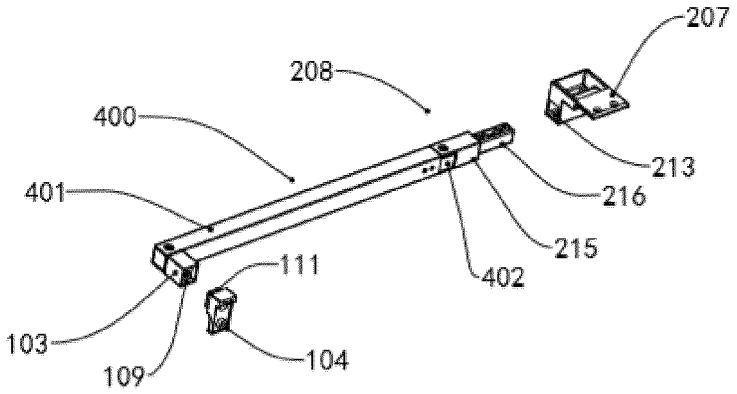
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Fig.11

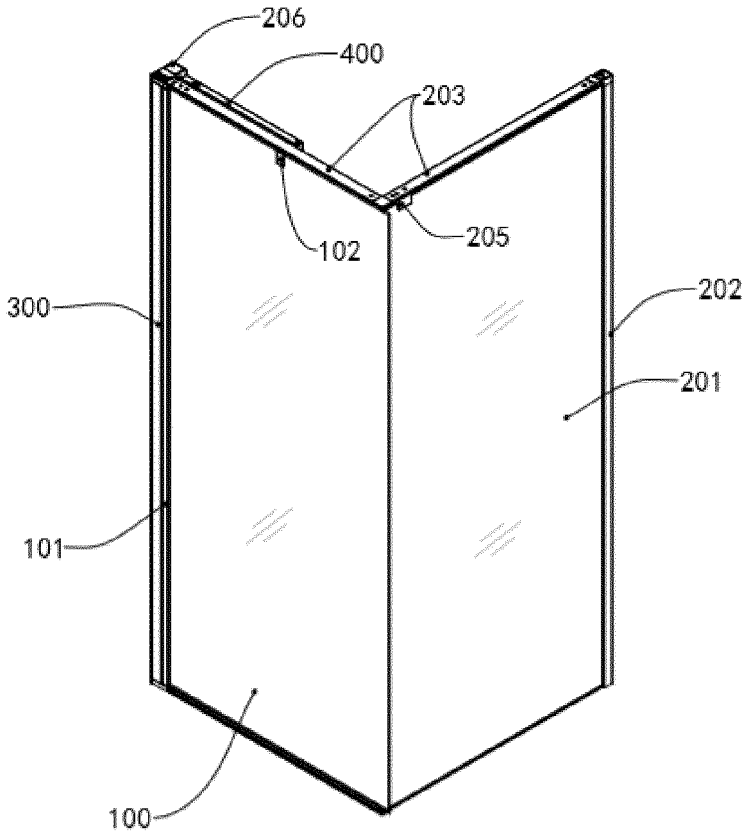

Fig.12

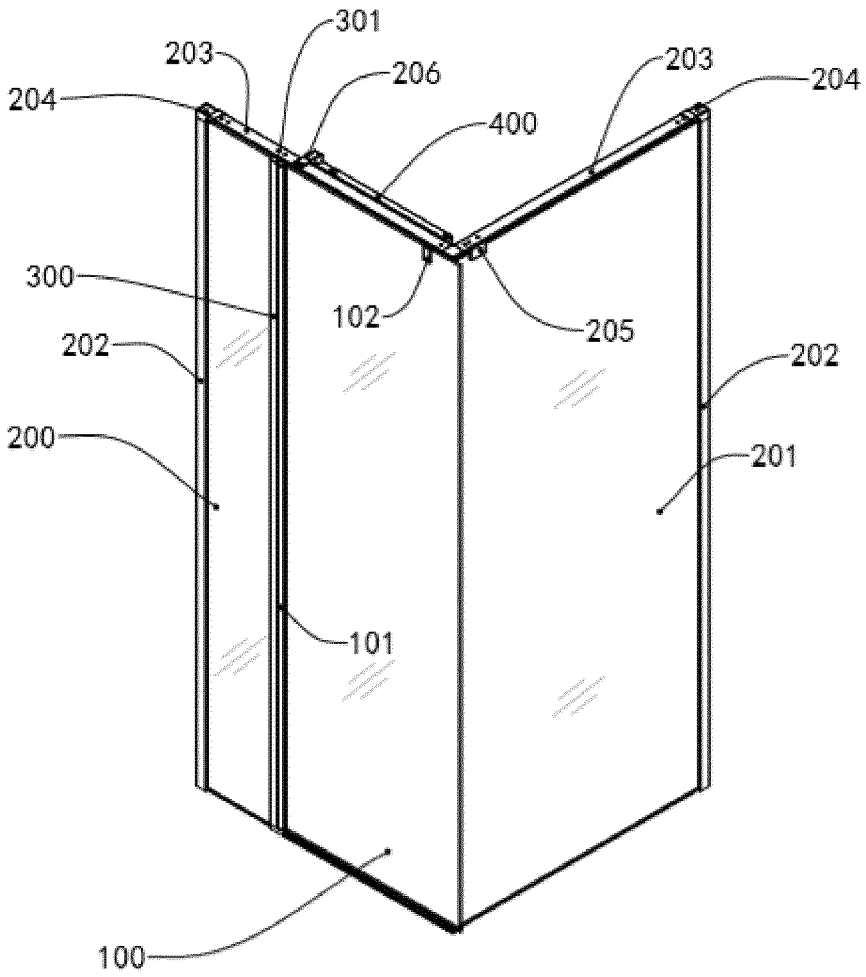

Fig.13

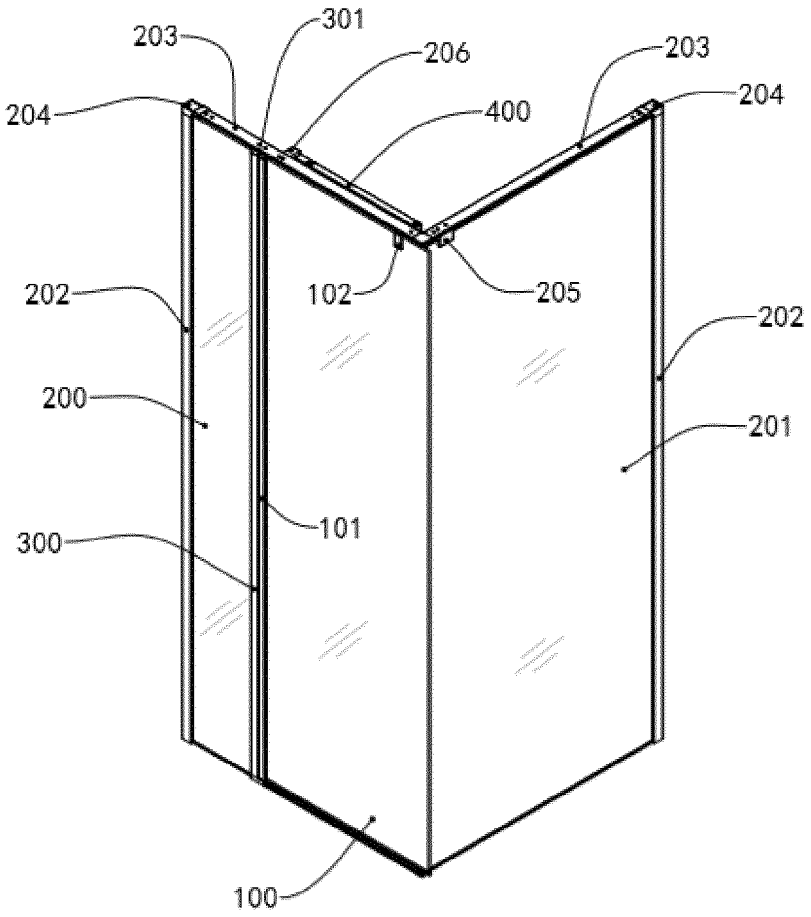

Fig.14

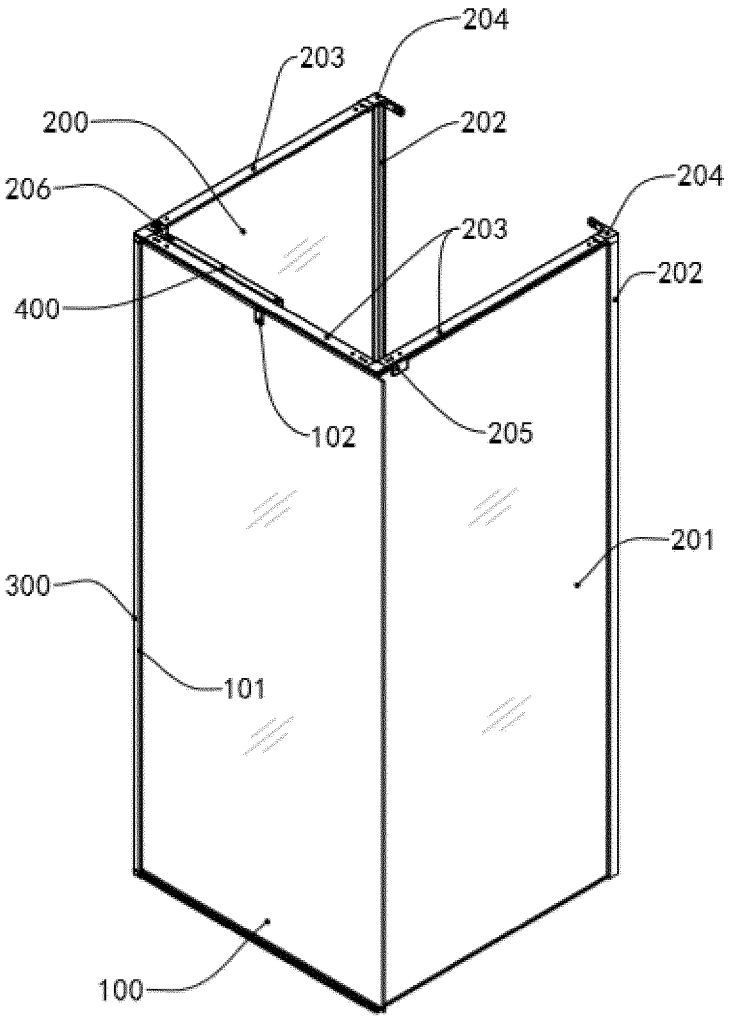

Fig.15

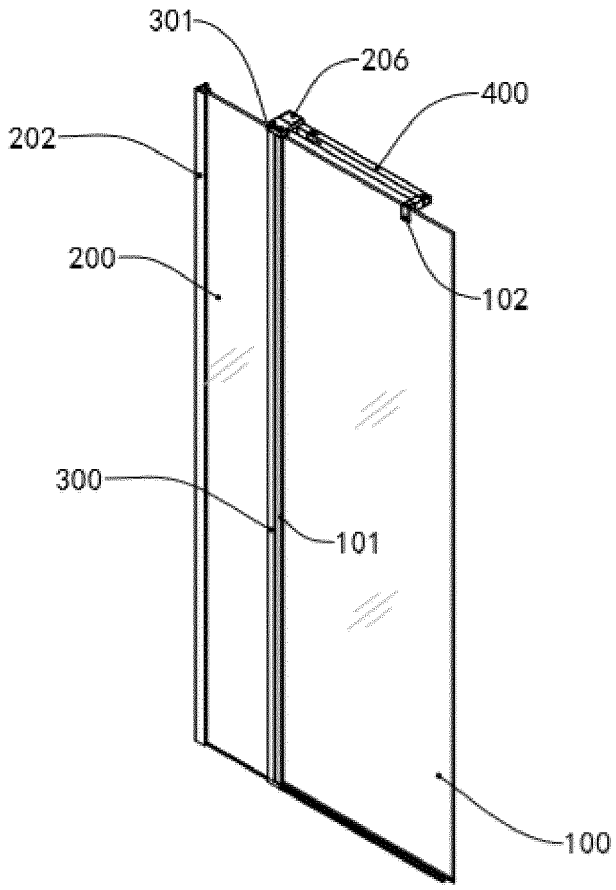

Fig.16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/080829

A. CLASSIFICATION OF SUBJECT MATTER

A47K 3/36(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47K 3; E05F 3; E05F 5; E06B 3

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

VEN; CNABS; CNTXT: 淋浴房, 关门, 闭, 闭门器, 滑动, 伸缩, 伸, 缩, 转动, 铰接, shower?, bath???, sanitary, glass, door?, leaf, clos+, enclos+, telescop+, slid+, extension, axis+, rotat+, pivot+, hinge?, gemel?

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 108699878 A (IDEAL SANITARY WARE CO., LTD.) 23 October 2018 (2018-10-23) description, paragraphs 29-33, and figures 1-9	1-10
A	CN 2685494 Y (HONG, Fangxing) 16 March 2005 (2005-03-16) entire document	1-10
A	CN 207144739 U (IDEAL SANITARY WARE CO., LTD.) 27 March 2018 (2018-03-27) entire document	1-10
A	CN 205477126 U (LI, Donghui) 17 August 2016 (2016-08-17) entire document	1-10
A	DE 202011103996 U1 (ASTEC GMBH DESIGN BESCHLAEGE) 19 October 2011 (2011-10-19) entire document	1-10
A	JP 2006225853 A (ITO, Y.J.) 31 August 2006 (2006-08-31) entire document	1-10

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 December 2019	**08 January 2020**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration** **No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088** **China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2019/080829

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 108699878 A	23 October 2018	None	
CN 2685494 Y	16 March 2005	None	
CN 207144739 U	27 March 2018	None	
CN 205477126 U	17 August 2016	None	
DE 202011103996 U1	19 October 2011	None	
JP 2006225853 A	31 August 2006	None	

Form PCT/ISA/210 (patent family annex) (January 2015)