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(54) SHOWER ROOM SWITCH DOOR STRUCTURE

(57) A shower cabin opening and closing door structure comprises a movable door (20) rotatable around an axis. A door closer (100) is disposed on the movable door (20) and comprises a main body (70) internally provided with a damper (703), a door closer clamping piece (40) connected to a first end of the main body (70) and a movable door clamping piece (120) connected to a second end of the main body (70), wherein a sliding piece (110) that is connected to the damper (703) and can extend or retract along a longitudinal direction of the main body (70) is disposed at the second end of the main body (70), an outer end of the sliding piece (110) is hinged to the movable door clamping piece (120), and the movable door clamping piece (120) is fixed to the movable door (20).

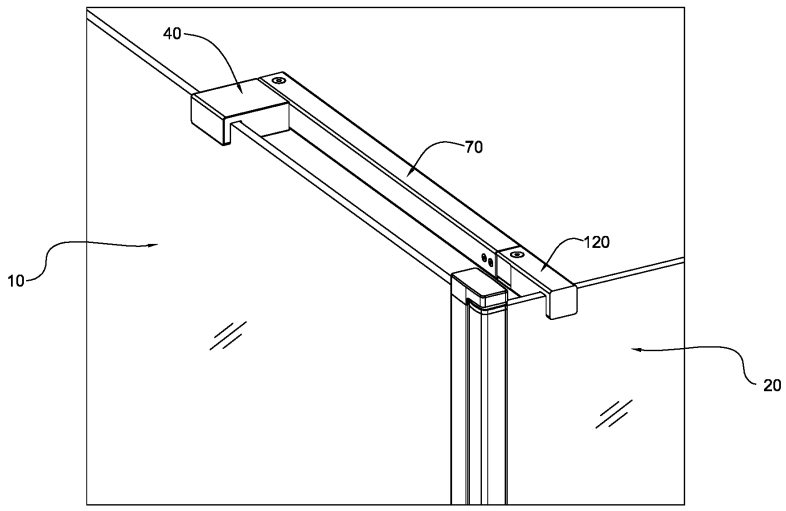

Fig. 8

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Description

Technical Field

[0001] The invention relates to the technical field of bathroom appliances, in particular to a shower cabin opening and closing door structure.

Background

[0002] At present, when people decorate houses, a shower cabin is usually disposed in a bathroom, and a shower door with a glass sheet is usually used for a common shower cabin. There are typically two types of movable doors serving as the shower door: a sliding door that translates laterally and a pivoting door that is rotatable about a rotating shaft.

[0003] The pivoting door typically has a metal frame comprising two side edges, with a glass sheet disposed between the two side edges. The shower door is usually provided with a frame fixed to a wall, and the pivoting door comprising the glass sheet is fixed to the frame, thereby fixing the glass sheet and the frame. In general, the rotating shaft is disposed on the pivoting door, the glass sheet is fixed on the rotating shaft, and the pivoting door can rotate around the rotating shaft, so as to achieve the opening and closing of the pivoting door.

[0004] An opening and closing door is provided with a frame made of metal leaning against a wall, the frame leaning against the wall is connected with one side of the fixed door, and the other side of the fixed door is connected with a vertical frame. One side of the movable door is provided with a vertical metal rotating shaft, and the movable door can rotate relative to the fixed door around the rotating shaft.

[0005] In order to achieve the rotation of the movable door, the metal rotating shaft on the movable door usually leans against one side of the fixed door with the vertical frame, upper ends and lower ends of the metal rotating shaft and the vertical frame are respectively provided with a fixed rotating shaft seat to integrally connect the fixed door with the movable door, and the movable door can rotate around the rotating shaft, thereby achieving the opening and closing of the movable door. Due to the relatively great weight of the movable door, a relatively large force is usually required to open and close the movable door. However, due to the fact that the movable door is great in weight and relatively large in inertia, when the movable door is closed to a limit position, the movable door can impact the frame or a limiting piece to greatly impact the movable door, the frame and the limiting piece; if an impact force is relatively large, the movable door may be broken or the frame and the limiting piece may be damaged, so that the use of the shower door may be influenced.

Technical Problem

[0006] The technical problem mainly solved by the present invention is to provide a shower cabin opening and closing door structure capable of reducing an impact force generated when a movable door is closed, aiming at the defects in the prior art.

Technical Solution

[0007] In order to solve the technical problem above, the present invention adopts the following technical solution: a shower cabin opening and closing door structure is designed and comprises a movable door rotatable around an axis, wherein a door closer is disposed on the movable door and comprises a main body internally provided with a damper, a door closer fixing piece connected to a first end of the main body and a movable door connecting piece connected to a second end of the main body, one end, close to the movable door connecting piece, of the main body is provided with a sliding piece that is connected to the damper and can extend or retract along a longitudinal direction of the main body, an outer end of the sliding piece is hinged to the movable door connecting piece, and the movable door connecting piece is fixed to the movable door.

[0008] It can be seen from the technical solution above, according to the shower cabin opening and closing door structure provided by the present invention, the door closer is disposed between a fixed structure and the movable door, and the sliding piece on the door closer is provided with a travel limit. When the movable door is opened to the limit position, the damper in the main body of the door closer drives the movable door to be positioned; and when the movable door is closed to the limit position, the sliding piece drives the damper to generate a buffering effect, so that a rotating speed of the movable door is reduced. Therefore, a great impact force caused by the movable door to a side fixed door, the frame and the limiting piece can be effectively avoided, and damage to the movable door, the side fixed door, the frame and the limiting piece can be avoided. Meanwhile, due to the effect of the door closer, the movable door can be tightly closed, and parts used for closing at a door closing position can be omitted.

[0009] In a preferred solution, the shower cabin opening and closing door structure further comprises a fixed door fixedly disposed, the movable door is connected to the fixed door through a rotating shaft, and the door closer is connected between the movable door and the fixed door, wherein the door closer fixing piece is a fixed door clamping piece clamping on the top of the fixed door, and the movable door connecting piece is a movable door clamping piece clamping on the top of the movable door. As the fixed door clamping piece and the movable door clamping piece of the door closer are respectively clamping on the tops of the fixed door and the movable door of a shower cabin, the fixed door clamping piece and the

movable door clamping piece can be additionally installed or disassembled after the shower cabin is installed, and installation and use of a shower cabin opening and closing door are also facilitated.

[0010] Further, the fixed door clamping piece is provided with a fixed door bayonet at an outer end thereof and a first screw hole adjacent to the fixed door bayonet, the fixed door bayonet is clamped on the top of the fixed door, and the fixed door clamping piece is fastened on the fixed door through a first fastening screw mating with the first screw hole; and the fixed door clamping piece is connected with the main body through a connecting piece, a first end of the connecting piece is connected to the first screw hole through threads, and a second end of the connecting piece is hinged with an end of the main body.

[0011] Further, the second end of the connecting piece is provided with a connecting through hole and penetrates through a through hole in the first end of the main body, a connecting pin formed by mating connection of a screw and a nut penetrates through the through hole in the first end of the main body and the connecting through hole of the connecting piece, and the connecting piece mates with the main body in a way of being rotatable relative to each other. The connecting pin formed by mating connection of the screw and the nut is adopted for connecting the main body with the connecting piece fixed on the fixed door clamping piece, so that the fixed door clamping piece can freely rotate by a certain angle relative to the main body when the door closer operates, and the sliding piece cannot be clamped when sliding.

[0012] In a preferred solution, the movable door clamping piece is provided with a movable door bayonet at an outer end thereof and a second screw hole adjacent to the movable door bayonet, the movable door bayonet is clamped on the top of the movable door, and the movable door clamping piece is fastened on the movable door through a second fastening screw mating with the second screw hole.

[0013] Furthermore, an outer end of the sliding piece is provided with a connecting hole, a connecting pin formed by mating connection of a screw and a nut penetrates through a connecting hole in an inner end of the movable door clamping piece and a connecting hole in an outer end of the sliding piece to connect the movable door clamping piece with the sliding piece, and the movable door clamping piece mates with the sliding piece in a way of being rotatable relative to each other. The connecting pin formed by mating connection of the screw and the nut is adopted for connecting the sliding piece with the movable door clamping piece, so that the movable door clamping piece can freely rotate by a certain angle relative to the main body when the door closer operates, and the sliding piece cannot be clamped when sliding.

[0014] Further, the inner end of the movable door clamping piece is provided with a semi-closed cavity, and the outer end of the sliding piece is received in the cavity.

[0015] In a preferred solution, one side of the fixed door is provided with a first vertical frame for fixing the fixed door on a wall, and the other side of the fixed door is provided with a second vertical frame abutting the rotating shaft of the movable door; and a first rotating shaft seat at an upper end of the second vertical frame and a second rotating shaft seat at a lower end of the second vertical frame are integrally connected with the rotating shaft through screws.

[0016] Further, a waterproof sealing piece is disposed between the second vertical frame and the rotating shaft.

[0017] Preferably, the main body is elongated.

Beneficial Effects

[0018] It can be seen from the technical solution above, the shower cabin opening and closing door structure provided by the present invention is simple and attractive, the speed can be greatly reduced when the movable door rotates to the limit position, and accordingly damage to the movable door, the side fixed door and the like caused by a relatively large impact force generated by the movable door is avoided. The shower cabin opening and closing door structure provided by the present invention uses fewer components, has less assembly difficulty, can be assembled on site in the shower cabin, and can meet the use requirements of different occasions.

Brief Description of the Drawings

[0019]

Fig. 1 is a schematic view of a shower cabin opening and closing door structure according to an embodiment of the present invention.

Fig. 2 is a schematic view showing an open state of a movable door of the shower cabin opening and closing door structure shown in Fig. 1.

Fig. 3 is an exploded schematic view of a door closer according to an embodiment of the present invention.

Fig. 4a and Fig. 4b are schematic views showing a closed state of the door closer shown in Fig. 3.

Fig. 5 is a schematic view showing an open state of the door closer shown in Fig. 3.

Fig. 6a and Fig. 6b are schematic views of a fixed door clamping piece in the door closer shown in Fig. 3.

Fig. 7a and Fig. 7b are schematic views of a movable door clamping piece in the door closer shown in Fig. 3.

Fig. 8 is an enlarged schematic view showing an installation state of the door closer shown in Fig. 3.

Fig. 9 is a schematic view of an alternative solution of the shower cabin opening and closing door structure according to another embodiment of the present invention.

Detailed Description

[0020] Various modes of the present invention will now be described in detail below, embodiments of which will be illustrated in conjunction with the accompanying drawings above and described hereinafter. In the accompanying drawings above, other elements that do not affect the protection scope of the claims of the present application are omitted.

[0021] Referring to Fig. 1, a shower cabin opening and closing door device of the present invention is installed on a shower cabin, for example at position A in Fig. 1. The shower cabin to which the opening and closing door structure of the embodiment is applied comprises a fixed door 10 on one side, a fixed door 30 on the other side and a rotary movable door 20, wherein the movable door 20 is connected with the fixed door 10 through a rotating shaft 201 on one side, and a door closer 100 is disposed between the fixed door 10 and the movable door 20. One side of the fixed door 10 is provided with a vertical frame 101 for fixing the fixed door 10 on a wall (not shown), and the other side of the fixed door 10 is provided with a vertical frame 102 abutting the rotating shaft 201 of the movable door 20.

[0022] Referring to Fig. 2, a rotating shaft seat 103 at an upper end of the vertical frame 102 and a rotating shaft seat 104 at a lower end of the vertical frame 102 are integrally connected with the rotating shaft 201 of the movable door by using screws, so that the movable door 20 can rotate around the fixed door 10 by utilizing the rotating shaft 201 thereof, thereby achieving the opening and closing of the shower cabin door. Preferably, a waterproof sealing piece is disposed between the vertical frame 102 and the rotating shaft 201.

[0023] Referring to Fig. 3 to Fig. 8, one end of the door closer 100 is provided with a fixed door clamping piece 40 for connecting the fixed door 10, and the fixed door clamping piece 40 is provided with a bayonet 401 for clamping on the top of the fixed door 10. The fixed door clamping piece 40 is fastened on the fixed door 10 through screw holes 402 and 403 in the fixed door clamping piece 40 by using two fastening screws 50. Threads 601 are formed at one end of a connecting piece 60, and the end of the connecting piece 60 is connected to the screw hole 402 or 403 in the fixed door clamping piece 40 through the threads 601. The other end of the connecting piece 60 is provided with a connecting through hole 602, and the end can be inserted into a through hole 702 in an end, close to the fixed door clamping piece 40, of a main body 70 of the door closer, a screw 80 and a nut 90 are used for penetrating through a through hole 701 in the end, close to the fixed door clamping piece 40, of the main body 70 of the door closer, and a connecting through hole 602 of the connecting piece 60 to integrally connect the fixed door clamping piece 40 with the main body 70 of the door closer. Meanwhile, the fixed door clamping piece 40 can rotate around the main body 70 of the door closer by a certain angle through a connecting pin formed by connection of the screw 80 and the nut 90.

[0024] Referring to Fig. 3 to Fig. 8, the other end of the door closer 100 is provided with a sliding piece 110 and a movable door clamping piece 120 for connecting the movable door 20, the sliding piece 110 is a part of the main body 70 of the door closer, the main body 70 of the door closer is internally provided with a damper 703 such as a hydraulic cylinder or a spring (which is a common structure of the door closer and is schematically indicated by a broken line in Fig. 3), and the sliding piece 110 is connected to the damper and can extend or retract along a longitudinal direction of the main body 70 of the door closer under the action of the damper. An outer end of the sliding piece 110 is provided with a connecting hole 1101, and the screw 80 and the nut 90 are used for penetrating through a connecting hole 1204 in the movable door clamping piece 120 and the connecting hole 1101 in the sliding piece 110 to connect the movable door clamping piece 120 with the main body 70 of the door closer. Meanwhile, the movable door clamping piece 120 can rotate around the sliding piece 110 on the main body 70 of the door closer by a certain angle through a connecting pin formed by connection of the screw 80 and the nut 90. The movable door clamping piece 120 is provided with a bayonet 1201 for clamping on the top of the movable door 20. The movable door clamping piece 120 is fastened on the movable door 20 through a screw hole 1202 in the movable door clamping piece 120 by using one fastening screw 50. Preferably, the movable door clamping piece 120 is provided with a semi-closed cavity 1203, and an end of the sliding piece 110 is hidden in the cavity 1203, so that the entire door closer 100 looks more attractive.

[0025] As can be seen, when the movable door 20 is opened, the movable door 20 drives the sliding piece 110 on the door closer 100 to slide and extend out of the main body 70 of the door closer, so that the door can be opened. When the movable door 20 is opened to a certain angle, the movable door 20 can be positioned without rocking due to the limiting effect of a rotating angle between the sliding piece 110 and the movable door clamping piece 120. When the movable door 20 is closed, due to the effect of the door closer 100, the movable door 20 is pulled back by a retracting force of the door closer 100 to achieve flexible closing, so that the rotating speed of the movable door 20 can be reduced, the impact on the fixed door 30 on the other side can be reduced, and damage to the fixed door 30, the movable door 20 and the like can be avoided. The movable door 20 can be tightly closed due to the effect of the retracting force of the door closer 100.

[0026] Of course, the embodiments above are only preferred embodiments of the present invention, and in practical application, the present invention has more modifications. For example, as shown in Fig. 9, the shower cabin may be not provided with fixed doors at two sides, but only be provided with a single movable door

200, in this case, the fixed door clamping piece is modified to be a fixing piece 400 that can be fixed on a wall 300. Such a variation can also achieve the object of the present invention.

Industrial Applicability

[0027] The shower cabin opening and closing door structure provided by the present invention can be manufactured and used in industry, and therefore has industrial applicability.

Claims

1. A shower cabin opening and closing door structure comprising:

   a movable door rotatable around an axis,
   characterized in that,
   a door closer is disposed on the movable door and comprises a main body internally provided with a damper, a door closer fixing piece connected to a first end of the main body and a movable door connecting piece connected to a second end of the main body, wherein a sliding piece that is connected to the damper and can extend or retract along a longitudinal direction of the main body is disposed at one end, close to the movable door connecting piece, of the main body, an outer end of the sliding piece is hinged to the movable door connecting piece, and the movable door connecting piece is fixed to the movable door.

2. The shower cabin opening and closing door structure according to claim 1, further comprising a fixed door fixedly disposed, wherein the movable door is connected to the fixed door through a rotating shaft, and the door closer is connected between the movable door and the fixed door; and the door closer fixing piece is a fixed door clamping piece clamping on the top of the fixed door, and the movable door connecting piece is a movable door clamping piece clamping on the top of the movable door.

3. The shower cabin opening and closing door structure according to claim 2, wherein the fixed door clamping piece is provided with a fixed door bayonet at an outer end thereof and a first screw hole adjacent to the fixed door bayonet, wherein the fixed door bayonet is clamped on the top of the fixed door, and the fixed door clamping piece is fastened on the fixed door through a first fastening screw mating with the first screw hole; and the fixed door clamping piece is connected with the main body through a connecting piece, a first end of the connecting piece is connected to the first screw hole through threads, and a second end of the connecting piece is hinged with an end of the main body.

4. The shower cabin opening and closing door structure according to claim 3, wherein the second end of the connecting piece is provided with a connecting through hole and penetrates through a through hole in the first end of the main body, a connecting pin formed by mating connection of a screw and a nut penetrates through a through hole in the first end of the main body and the connecting through hole of the connecting piece, and the connecting piece mates with the main body in a way of being rotatable relative to each other.

5. The shower cabin opening and closing door structure according to claim 2, wherein the movable door clamping piece is provided with a movable door bayonet at an outer end thereof and a second screw hole adjacent to the movable door bayonet, the movable door bayonet is clamped on the top of the movable door, and the movable door clamping piece is fastened on the movable door through a second fastening screw mating with the second screw hole.

6. The shower cabin opening and closing door structure according to claim 5, wherein an outer end of the sliding piece is provided with a connecting hole, a connecting pin formed by mating connection of a screw and a nut penetrates through a connecting hole in an inner end of the movable door clamping piece and a connecting hole in an outer end of the sliding piece to connect the movable door clamping piece with the sliding piece, and the movable door clamping piece mates with the sliding piece in a way of being rotatable relative to each other.

7. The shower cabin opening and closing door structure according to claim 6, wherein the inner end of the movable door clamping piece is provided with a semi-closed cavity, and the outer end of the sliding piece is received in the cavity.

8. The shower cabin opening and closing door structure according to claim 2, wherein one side of the fixed door is provided with a first vertical frame for fixing the fixed door on a wall, and the other side of the fixed door is provided with a second vertical frame abutting the rotating shaft of the movable door; and a first rotating shaft seat at an upper end of the second vertical frame and a second rotating shaft seat at a lower end of the second vertical frame are integrally connected with the rotating shaft through screws.

9. The shower cabin opening and closing door structure according to claim 8, wherein a waterproof sealing piece is disposed between the second vertical frame

and the rotating shaft.

10. The shower cabin opening and closing door structure according to claim 1, wherein the main body is elongated.

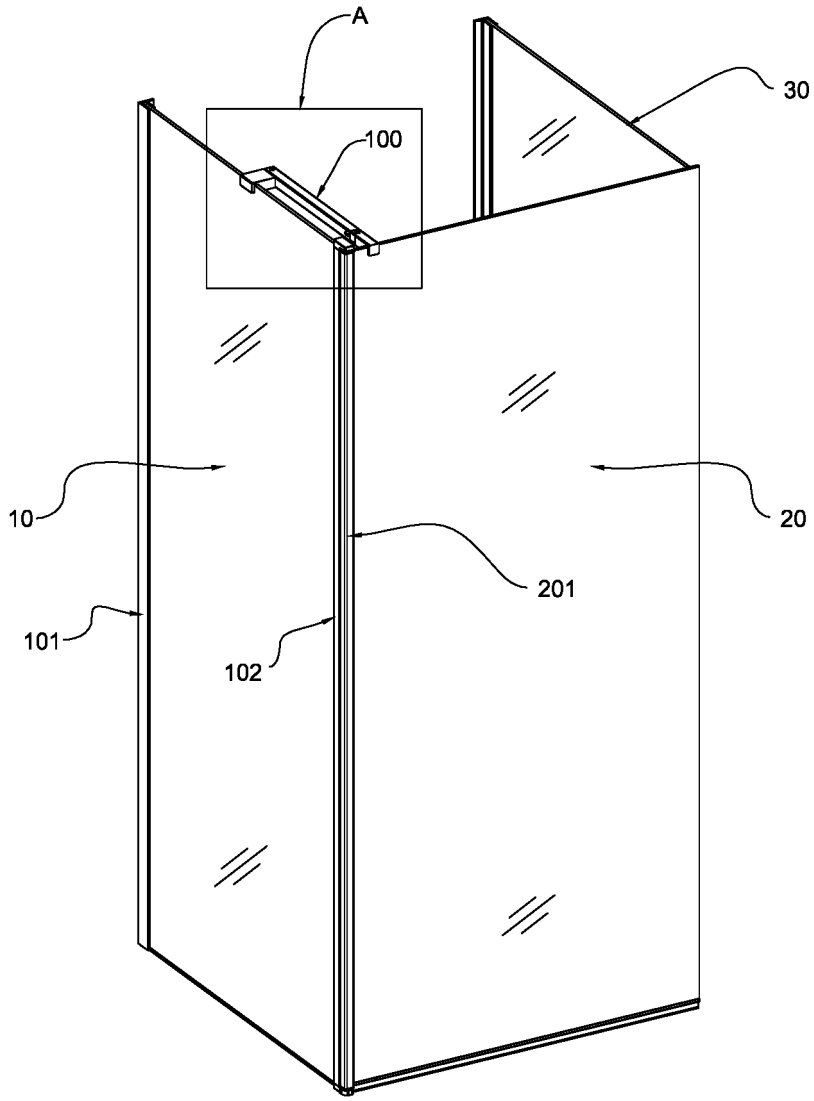

Fig. 1

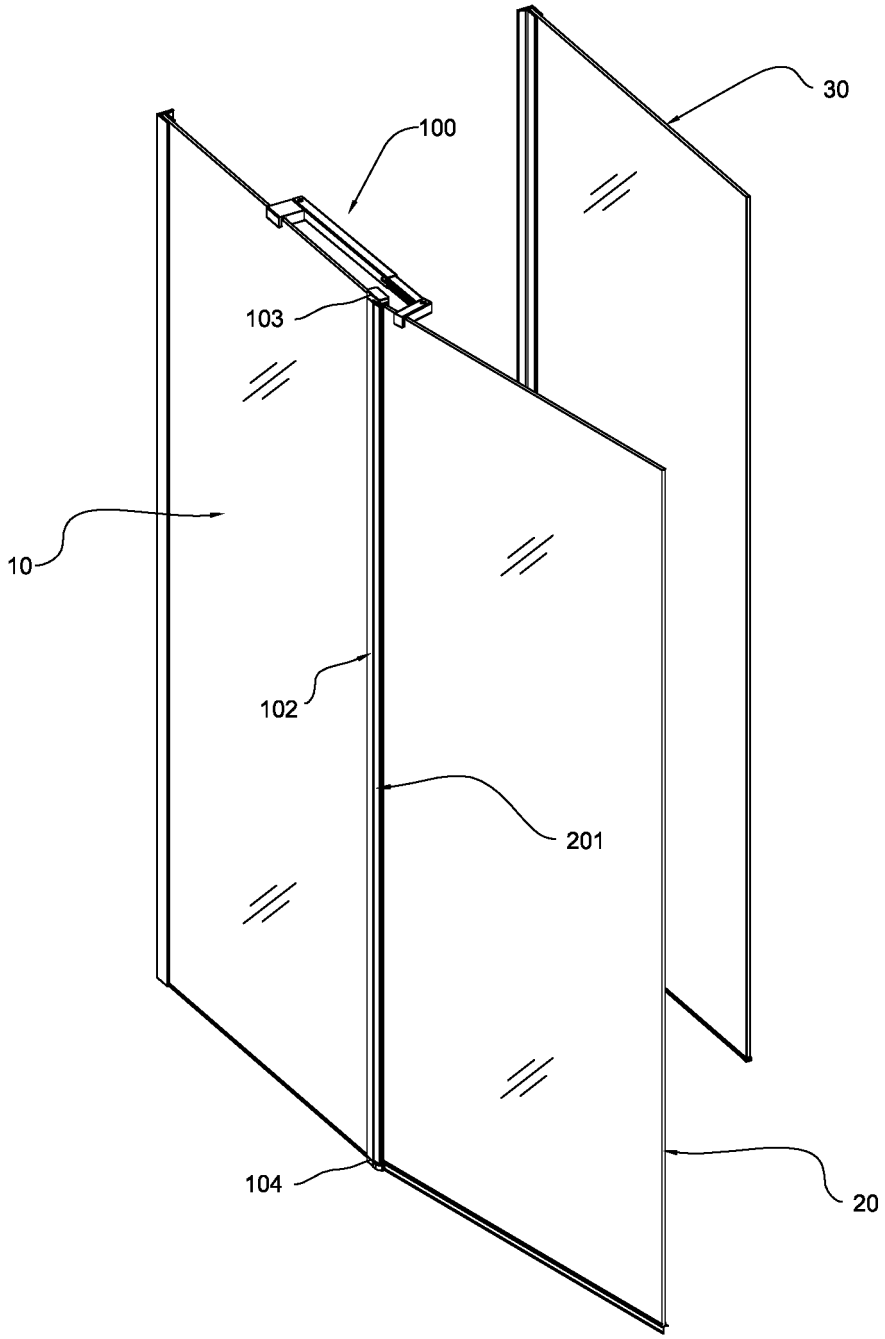

Fig. 2

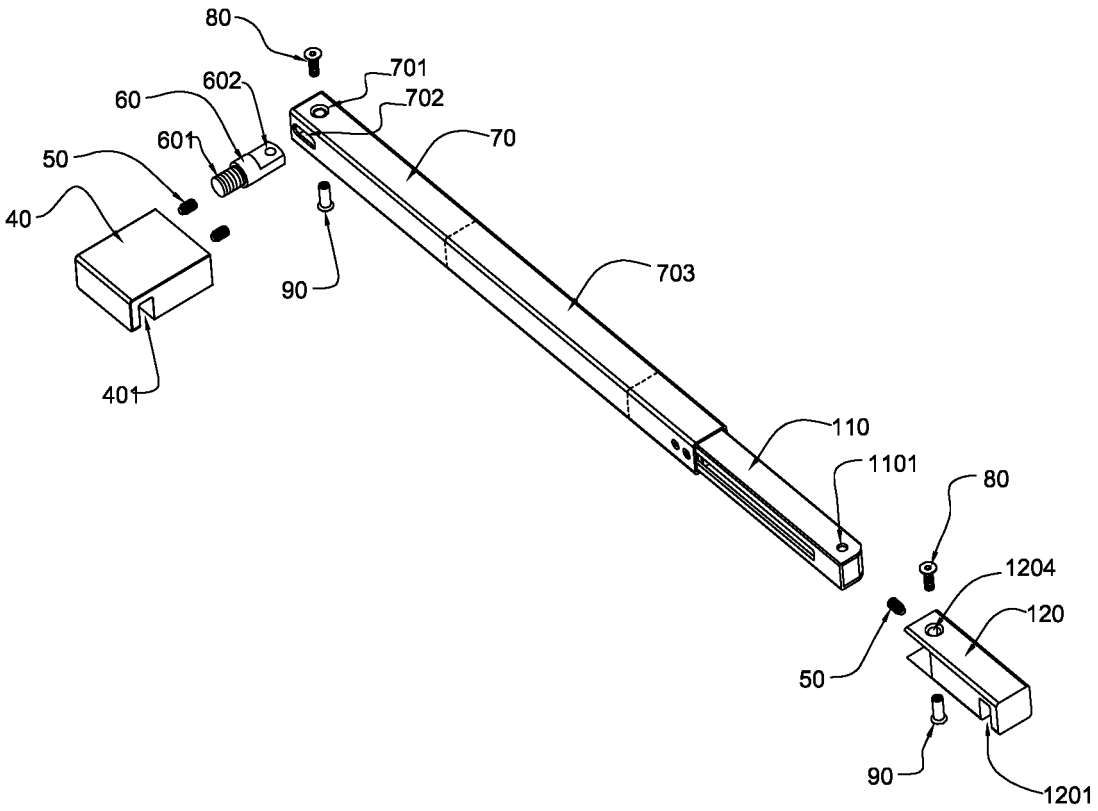
80
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Fig. 3

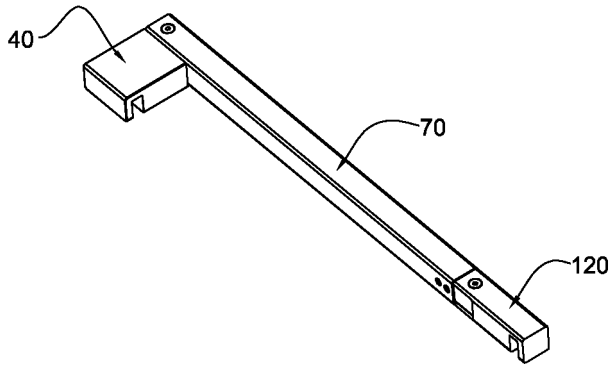

Fig. 4a

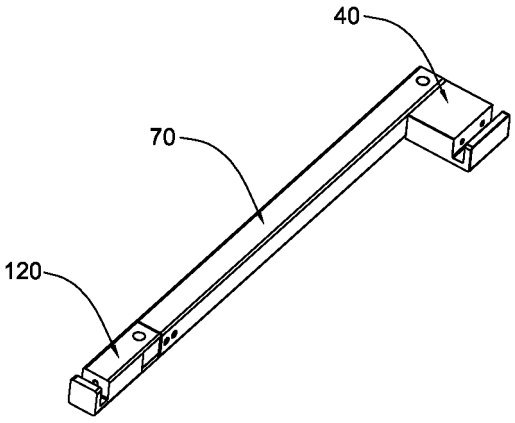

Fig. 4b

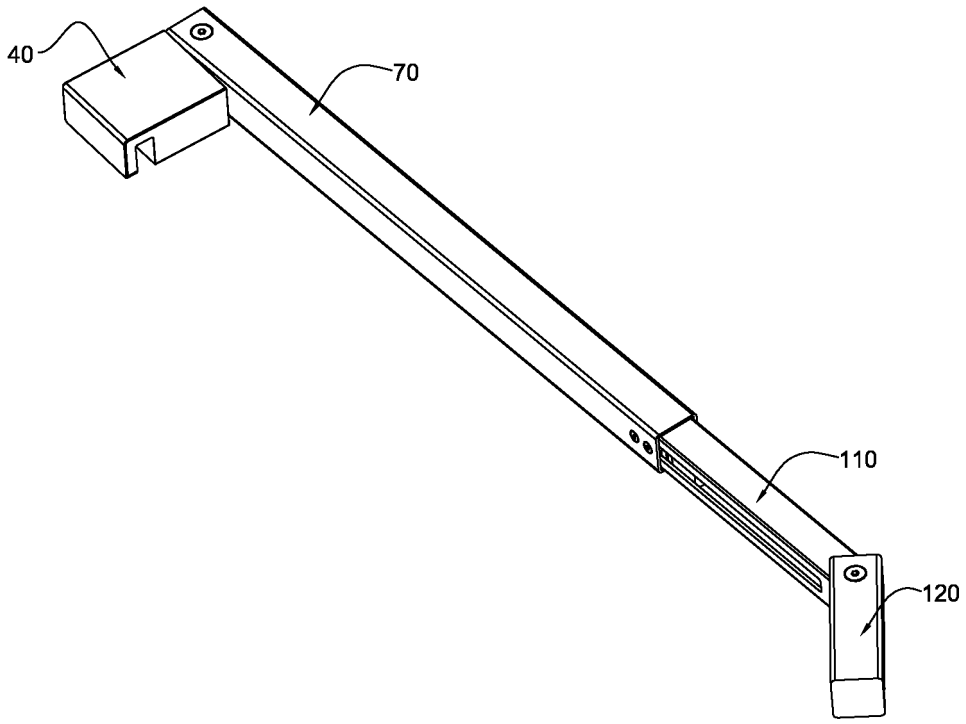

Fig. 5

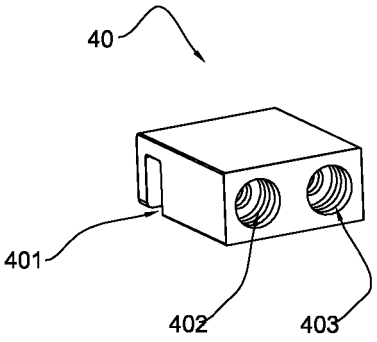

Fig. 6a

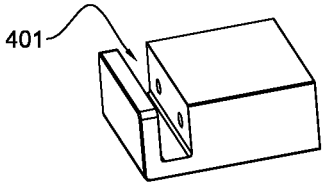

Fig. 6b

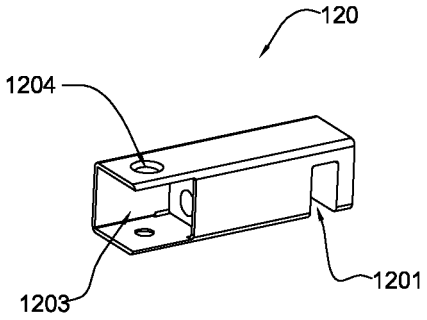

Fig. 7a

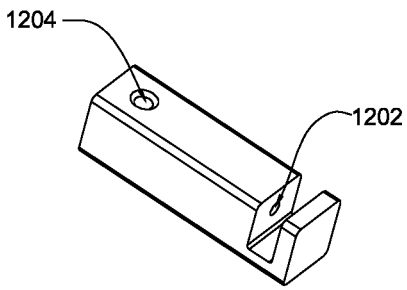

Fig. 7b

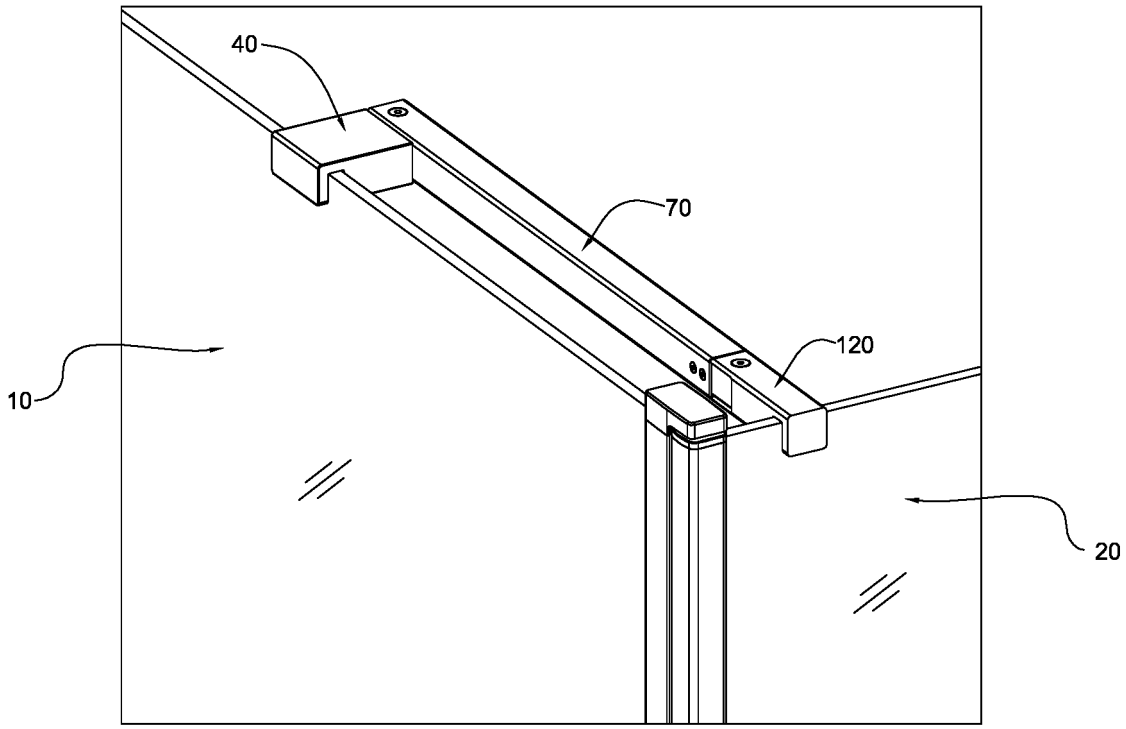

Fig. 8

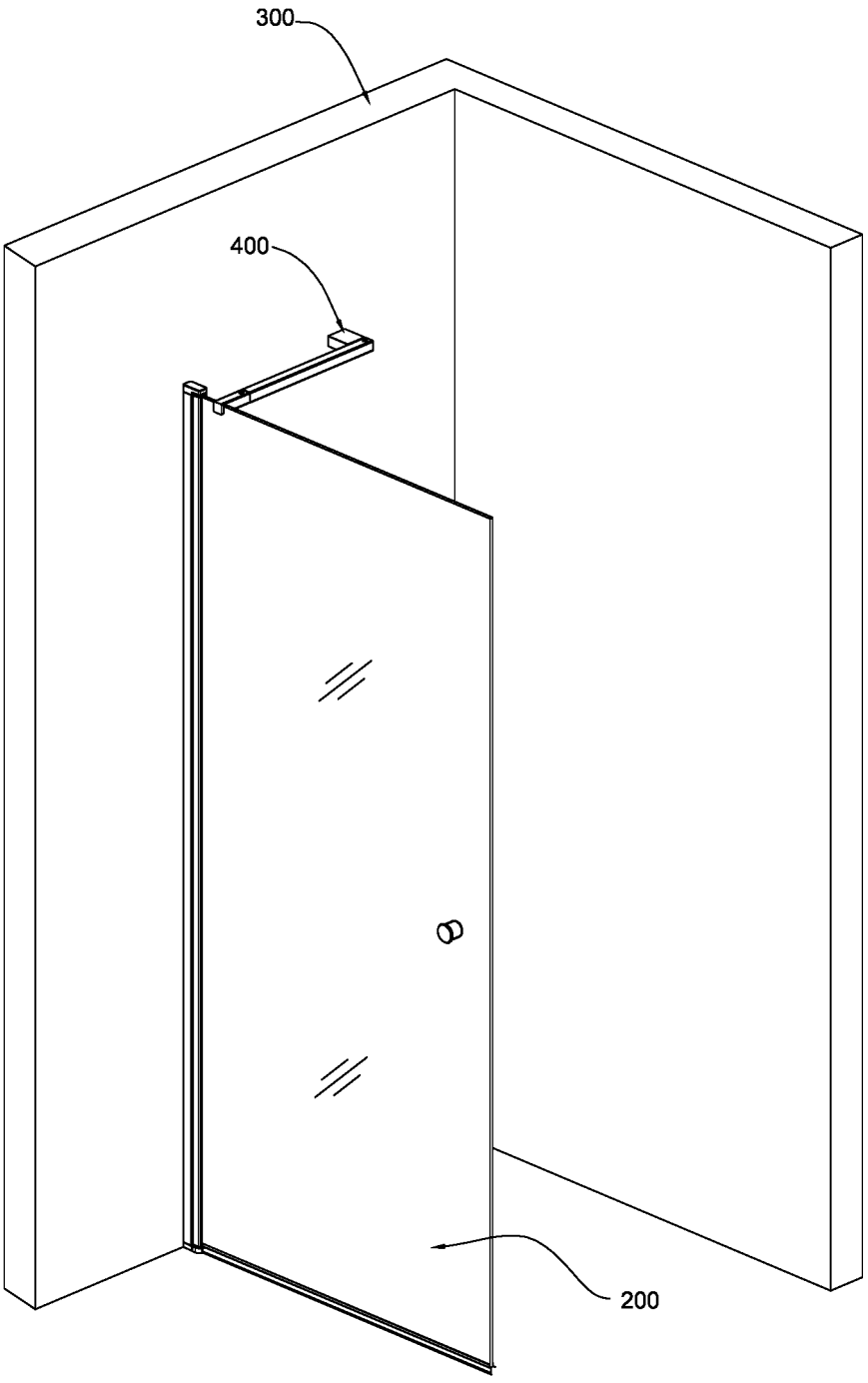

Fig. 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/089490

A. CLASSIFICATION OF SUBJECT MATTER

E05F 3/20(2006.01)i; E05F 5/06(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)

E05F

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)

CNABS, CNKI, VEN, DWPI: 淋浴房, 关门, 闭, 闭门器, 阻尼, 滑动, 伸缩, 伸, 缩, 弹簧, 液压, 转动, 铰接, door, spring, hydraulic pressure, flex, extend, contract, close, move, slide, sliding, damper, rotating.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 202086366 U (ZHEJIANG COBO TECHNOLOGY DEVELOPMENT CO., LTD.) 28 December 2011 (2011-12-28) description, specific embodiment, and figures 1-3	1-10
Y	CN 201705097 U (LI, XINPENG) 12 January 2011 (2011-01-12) description, specific embodiment, and figures 1 and 2	1-10
A	CN 207194744 U (SUZHOU FENGSHI LABORATORY ANIMAL EQUIPMENT CO., LTD.) 06 April 2018 (2018-04-06) description, specific embodiment, and figures 1 and 2	1-10
A	CN 204609573 U (WANG, BEISHENG) 02 September 2015 (2015-09-02) entire document	1-10
A	CN 206409093 U (FOSHAN BAYSEE SECURITY AND SAFETY TECHNOLOGY CO., LTD.) 15 August 2017 (2017-08-15) entire document	1-10
A	CN 202501701 U (QINGDAO TURBO AIR INC.) 24 October 2012 (2012-10-24) entire document	1-10

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

* Special categories of cited documents:

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"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 February 2019	**06 March 2019**
Name and mailing address of the ISA/CN **National Intellectual Property Administration, PRC (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** **China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/089490

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 107882460 A (NINGBO CENTURY PROTECTION EQUIPMENT FACTORY) 06 April 2018 (2018-04-06) entire document	1-10
A	CN 206861981 U (QINGDAO HAIER SPECIAL FREEZER CO., LTD.) 09 January 2018 (2018-01-09) entire document	1-10
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