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(54) CONNECTING MEMBER FOR SECTION BAR, SECTION BAR AND CONNECTING STRUCTURE OF SECTION BAR

(57) In order to eliminate defects of appearance and stress bearing performance in existing profile attaching structure, a profile attaching structure, profiles therein, and a profile attachment is disclosed. The profile attachment comprises an attachment main body I, an attachment main body II and a locking component for preventing detachment of the attachment main bodies. The profile comprises a first profile matched with the attachment main body I and a second profile matched with the attachment main body II. A first sliding groove and a slide table on the attachment main body I are matched with a second U-shaped opening and a first U-shaped opening on the first profile, respectively. The attachment main body I can be wrapped by the first profile. An embedded protrusion on the attachment main body II is matched with and embedded into an embedded cavity of the second profile. The attachment main body II is also provided with a first slide rail matched with the first sliding groove and a second slide rail matched with the slide table. The attachment main body I and the attachment main body II are locked and fastened by a locking component.

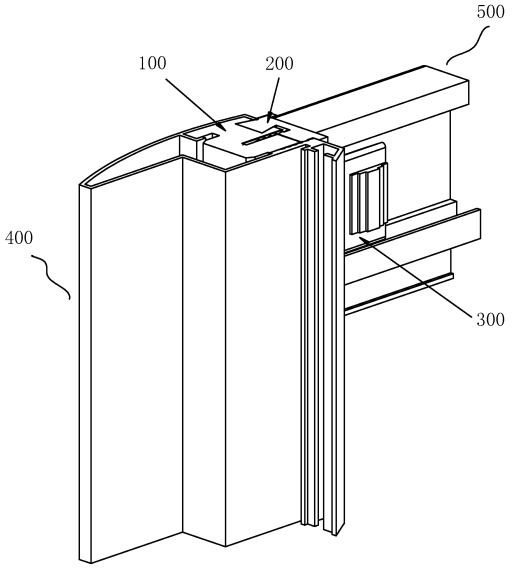

FIG 12

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Description

Field of the Invention

[0001] The present invention relates to an attachment for attaching profiles, the profiles therein, and a profiles attaching structure. More specifically, the present invention relates to a rapidly assembling attachment for profiles using in a shower enclosure, the profiles therein, and an attaching structure of the profiles.

Background of the Invention

[0002] In shower enclosure industry, a framework of the enclosure mostly consists of two beams at top and bottom edges, and two vertical columns at side edges. In order to attach the beams and the vertical columns, three assembling manners are always employed as following.

[0003] Firstly, in the beams is provided with mounting holes for fastening screws, and in the vertical columns is provided with through- holes through which the screws are inserted. The through holes have a diameter larger than the nominal diameter of the screw, and smaller than the screw head. The screws are inserted into the vertical columns and enter into the connecting holes of the beams, through which connecting and fixing is realized.

[0004] Secondly, a fixing fastener protruding from the vertical columns is installed on the vertical columns in advance, then the fixing fasteners is inserted into the beams, and finally the fixing fasteners and the beams are fastened by screws.

[0005] When installation is implemented in aforesaid two manners, consumers may need tools, including screwdrivers, electric hand drills, and forceps, and always change tools according to requirements of installation of the screws during assembly, thereby consuming much more time in assembling the product.

[0006] Thirdly, two plastic fasteners are mounted respectively on the beams and the vertical columns, from which two plastic fasteners are protruded. The beams are attached to, and fixed on, the vertical columns, via locking structures of the plastic fasteners.

[0007] In the third assembly manner, the attachment is designed to have a large size, thus it is guaranteed that the attachment enables to endure loading stress in use. The beams and the vertical columns are made of aluminum alloy, however the plastic attachments are made of plastic. Since these two materials are very different in color, the connecting position between the beams and the vertical columns looks ugly. In addition, due to excessive exposure of the connecting structures, the waterproof performance of the connecting position is very poor. Thus water seeps outside of the shower enclosure, causing the floor outside of the shower enclosure slippery.

[0008] Chinese Utility Model Patent Application (Patent No.: ZL 200720111895.1; Publication No.: CN201059417Y), titled "A Profile Attachment Capable of Assembling Rapidly" and Published on 14 May 2008, has disclosed a rapid-assembly attachment for profiles, which comprises a first main body 2 with a groove, and a second main body 3 with a protrusion. The protrusion is inserted into the groove, and is fastened by a locking component, thus the first main body 2 is attached to the second main body 3 forming an integral part. When aforesaid attachment and profiles are adopted, since the first main body 2 is attached to the second main body 3 merely via the insertion connecting of the groove and the protrusion, which is a monorail fitting connection, the connection position is not stable, the stress applied on the attachment is not balanced, causing the attachment is easy to be damaged. Moreover, when aforesaid attachment structure is adopted, since the first main body 2 is attached to a corresponding first profile 5 merely via a raised strip 23 on the end face, the fastening between the first main body 2 and the first profile 5 is not firm enough. Furthermore, when aforesaid attachment structure is adopted, after the attachment is attached to the profiles, both the groove on the first main body 2, and the protrusion on the second main body 3 are exposed outside of the profiles. The attachment structure not only looks ugly, but also has very poor waterproof performance at the connecting position, thus water seeps outside of the shower enclosure from the gap at the connecting position, causing the floor outside the shower enclosure slippery.

Summary of the Invention

[0009] In view of deficiencies in the prior art that the size of the attachment for profiles is large, the overall shower enclosure looks ugly as the attachment is exposed outside the beams and vertical columns, and water seeps outside the shower room to cause the floor slippery, the present invention aims at providing an attachment with advantages of rapid assembly, nice appearance, no seeping outside the shower enclosure and good attaching strength, as well as profiles and profiles attaching structure, which will meet consumers' requirements on quick assembly and disassembly of profiles, good bearing stress performance at the attaching position, nice appearance and excellent water proof effect.

[0010] The purpose of the invention is realized through the following technical solutions. A profile attachment comprises an attachment main body I for connecting a first profile, an attachment main body II for connecting a second profile, and a locking component for preventing the attachment main body I from detaching from the attachment main body II. The attachment main body I and the attachment main body II are provided with a first connecting surface and a second

connecting surface, respectively, which corresponds to each other. The back face of the second connecting surface is a third connecting surface. On the first connecting surface is provided with a first sliding groove and a slide table, which is in parallel to the first sliding groove. A first groove is arranged between the slide table and the first sliding groove. The second connecting surface is provided with a first slide rail matched with the first sliding groove, and a second slide rail matched with the slide table. The third connecting surface is provided with an embedded protrusion matched with an embedded cavity of the second profile.

[0011] Preferably, the attachment main body I is further provided with a restricting structure for preventing the attachment main body I from sliding out of an embedded cavity of the first profile.

[0012] Preferably, the locking component is formed by inserting a locking protrusion into a locking insert. The locking protrusion is located on the third connecting surface. A slot for receiving the wall of the embedded cavity in the second profile is arranged between the locking protrusion and the embedded protrusion. An insert chute corresponding to the locking protrusion is disposed on a side surface of the locking insert. Locking pins are arranged on the front end of the locking insert. The attachment main body II is provided with through holes for the locking pins to pass through and reach the back face of the connecting third surface, from the connecting third surface. On the attachment main body I is provided with a positioning component fitting with the locking pins.

[0013] Preferably, the locking insert and the locking protrusion are provided with locking components matched with each other, respectively.

[0014] Preferably, the locking components matched with each other refer to a positioning groove disposed on the locking protrusion and a positioning bump disposed on the locking insert, or, a positioning bump disposed on the locking protrusion and a positioning groove disposed on the locking insert.

[0015] Preferably, there are two locking pins including a first locking pin and a second locking pin extending forward along walls on both sides of the insert chute, respectively; and correspondingly, there are two through holes located on both sides of the locking protrusion, respectively.

[0016] Preferably, a tail end of the first sliding groove has a closed end.

[0017] Preferably, the positioning component on the attachment main body I comprises a first locking hole disposed on the slide table and a positioning end located at an end of the slide table. The first locking pin matches with the first locking hole, and the inner end face of the second locking pin fits with the positioning face of the positioning end. A first connecting hole, located below the positioning end of the slide table, is adopted as the restricting structure on the attachment main body I.

[0018] Preferably, given that the first connecting surface of the attachment main body I is the front face, a positioning portion, matched with the positioning structure on a wall of the inner cavity of the first profile, is further arranged on both sides of the attachment main body I or on a side wall of a back face of the first connecting surface.

[0019] Preferably, on the locking protrusion is provided with a third connecting hole matched with the connecting hole which is positioned on the wall of the embedded cavity of the second profile embedded into the slot.

[0020] Preferably, the embedded protrusion consists of an upper embedded protrusion, a middle embedded protrusion and a lower embedded protrusion, which are separately disposed in an L shape. The upper embedded protrusion is located at the bent end of the L shape, and the locking protrusion is disposed opposite to the middle embedded protrusion.

[0021] Preferably, both the first sliding groove and the insert chute are dovetail grooves, and correspondingly, the first slide rail and the locking protrusion respectively matched therewith are in a structure of dovetail blocks.

[0022] Preferably, the table top of the slide table is lower than a table top of a wall top part of the first groove.

[0023] The second purpose of the invention is to provide a profile matched with the attachment main body I, comprising an embedded cavity for the attachment main body I to be embedded therein. The embedded cavity comprises a concave cavity and a convex cavity, a concave surface and an embedded groove corresponding to the concave cavity, and a convex surface corresponding to the convex cavity. The concave surface is connected with the convex surface via a connecting wall. A first U-shaped opening is provided on the concave surface located at an end of the profile, and a second U-shaped opening and ribs located on both sides of the second U-shaped opening are provided on the convex surface located at the end of the profile.

[0024] Preferably, a restricting structure, for preventing the embedded member in the embedded cavity from sliding out of the embedded cavity, is arranged on a wall of the concave cavity or the convex cavity located at the end of the profile.

[0025] Preferably, the restricting structure on the wall of the concave cavity or the convex cavity is a second connecting hole disposed below the first U- shaped opening.

[0026] Preferably, given that the cavity wall on one side of the U- shaped opening is the front face, a positioning structure, for positioning the embedded member that is embedded into the embedded cavity, is arranged on an inner wall of the embedded cavity on the left or right side or the back face of the section bar.

[0027] Preferably, the positioning structure is an L- shaped flange located on the inner wall of the embedded cavity on the left or right side of the section bar, and the bent portion of the L- shaped flange faces one side of the U- shaped opening.

[0028] The third purpose of the invention is to provide a profile attaching structure, comprising a first profile, a second

profile, and an attachment for attaching the first profile and the second profile together. The attachment comprises an attachment main body I for connecting a first profile, an attachment main body II for connecting a second profile, and a locking component for preventing the attachment main body I from detaching from the attachment main body II. The attachment main body I and the attachment main body II are respectively provided with a first connecting surface and a second connecting surface, which are corresponding to each other. The back face of the second connecting surface is a third connecting surface. The first profile comprises an embedded cavity for the attachment main body I to be embedded therein. The embedded cavity comprises a concave cavity and a convex cavity, a concave surface and an embedded groove corresponding to the concave cavity, and a convex surface corresponding to the convex cavity. The concave surface is connected with the convex surface via a connecting wall. On the first connecting surface of the attachment main body I is provided with a first sliding groove matched with the convex cavity, and a slide table which is in parallel to the first sliding groove and matches with the concave cavity. A first groove matched with the connecting wall is disposed between the slide table and the first sliding groove. The concave surface located at the end of the profile is provided with a first U-shaped opening for the slide table to protrude from, and the convex surface located at the end of the profile is provided with a second U-shaped opening for the first sliding groove to expose from, and ribs located on both sides of the second U-shaped opening for blocking the wall top part of the first sliding groove inside the convex cavity. The second connecting surface of the attachment main body II is provided with a first slide rail matched with the first sliding groove, and a second slide rail matched with the slide table. The third connecting surface is provided with an embedded protrusion. The second profile is provided with an embedded cavity matched with the embedded protrusion.

[0029] Preferably, the attachment main body I is provided with a restricting structure for preventing the attachment main body I from sliding out of the embedded cavity of the first profile, and correspondingly, a restricting portion matched with the restricting structure of the attachment main body I is arranged on the wall of the embedded cavity of first profile.

[0030] Preferably, the locking component is formed by inserting a locking protrusion into a locking insert. The locking protrusion is located on the third connecting surface, and a slot for embedment of the wall of the embedded cavity of the second profile is arranged between the locking protrusion and the embedded protrusion. An insert chute corresponding to the locking protrusion is disposed on a side surface of the locking insert. Locking pins are arranged on the front end of the locking insert. The attachment main body II is provided with through holes for the locking pins to pass through to reach the back face of the third connecting surface from the third connecting surface. On the attachment main body I is provided with a positioning component fitting with the locking pins.

[0031] Preferably, the locking insert and the locking protrusion are respectively provided with locking pieces matched with each other.

[0032] Preferably, the locking pieces matched with each other refer to a positioning groove disposed on the locking protrusion and a positioning bump disposed on the insert chute of the locking insert, or, a positioning bump disposed on the locking protrusion and a positioning groove disposed on the insert chute of the locking insert.

[0033] Preferably, there are two locking pins including a first locking pin and a second locking pin extending forward along walls on both sides of the insert chute, respectively; and correspondingly, there are two through holes located on both sides of the locking protrusion, respectively.

[0034] Preferably, the table top of the slide table is lower than that on the top of the wall of the first chute, and the second slide rail on the attachment main body II is embedded into the embedded groove.

[0035] Preferably, a tail end of the first sliding groove has a closed end.

[0036] Preferably, the positioning component on the attachment main body I comprises a first locking hole disposed on the slide table, and a positioning end located at an end of the slide table. The first locking pin matches with the first locking hole, and the inner end face of the second locking pin fits with the positioning face of the positioning end. The restricting structure on the attachment main body I is a first connecting hole located below the positioning end of the slide table. The restricting portion on the first profile is a second connecting hole disposed below the first U- shaped opening.

[0037] Preferably, given that the connecting surface I of the attachment main body I is the front face, a positioning portion is further arranged on both sides of the attachment main body I or on a side wall of a back face of the first connecting surface, and correspondingly, a positioning structure matched with the positioning portion is arranged on the wall of the inner cavity of the first profile.

[0038] Preferably, the locking protrusion is provided with a third connecting hole, and a fourth connecting hole matched with the third connecting hole is arranged on the wall of the embedded cavity of the second profile that is embedded into the slot.

[0039] Preferably, the embedded protrusion consists of an upper embedded protrusion, a middle embedded protrusion and a lower embedded protrusion, which are separately disposed in an L shape. The upper embedded protrusion is located at the bent end of the L shape, and the locking protrusion is disposed opposite to the middle embedded protrusion. The embedded cavity of the second section bar comprises an upper embedded cavity, a middle embedded cavity and a lower embedded cavity, which are also separately disposed in an L shape and match with the upper embedded protrusion, the middle embedded protrusion and the lower embedded protrusion, respectively. The upper embedded

cavity is located at the bent end of the L shape.

[0040] Preferably, both the first sliding groove and the insert chute are dovetail grooves, and correspondingly, the first slide rail and the locking protrusion respectively matched therewith are in a structure of dovetail blocks.

[0041] The application of the attachment, profiles, and profiles attaching structure of the present invention has the following advantages.

1. Since the attachment main body I of the invention is embedded into the first profile as a whole, and is wrapped by the first profile, the embedded attachment main body I is invisible from the external surface of the first profile, and the bearing stress of the attachment main body I is enhanced greatly. Thus the profile not only looks nice, but also enhances the overall stress bearing performance.
2. Since the attaching position of the attachment main body I and the attachment main body II is also inside the first profile, the waterproof performance at the attaching position of the first profile and the second profile is greatly improved. Thus water inside the shower enclosure can be effectively prevented from flowing outside the shower enclosure along the attaching position.
3. The position of the attachment may be protected by the thickness of the first profile, in this way, the attachment main body I may be hidden inside the first profile and the overall stress bearing performance of the attachment is enhanced. In addition, the design of double positioning surfaces of the slide table and the first slide rail can limit the position of the attachment main body I in a better manner, so the attachment main body I is prevented from unbalanced stress, and the attaching is firmer.

Brief Description of the Drawings

[0042]

Fig. 1 is a schematic structure diagram of attachment main body I according to a profile attachment embodiment of the invention;

Fig. 2 is a schematic structure diagram of a first profile according to a profile embodiment of the invention;

Fig. 3 is an end view of the first profile according to the profile embodiment of the invention;

Fig. 4 is a schematic working diagram of embedding the attachment main body I in the first profile according to an embodiment of the invention;

Fig. 5 is a schematic structure diagram of the attachment main body II according to a profile attachment embodiment of the invention;

Fig. 6 is a schematic structure diagram of Fig. 5 after rotating by 180 degrees about the vertical direction;

Fig 7 is a schematic structure diagram of a second profile according to the section bar embodiment of the invention;

Fig. 8 is a schematic structure diagram of Fig. 7 after rotating by 90 degrees clockwise about the vertical direction;

Fig. 9 is a schematic structure diagram of a locking component according to the profile attachment embodiment of the invention;

Fig. 10 is a schematic working diagram of attaching the attachment main body II to the second profile according to an embodiment of the invention;

Fig. 11 is a schematic structure diagram when the attachment main body I, the attachment main body II and the locking component are assembled together according to an embodiment of the invention; and

Fig. 12 is a schematic structure diagram when the second profile and the first profile are connected by the attachment according to an embodiment of the invention.

Explanation of reference numerals:

[0043]

100	*Attachment main body I*	**101**	*Wall top part*	**104**	*Second groove*	**106**	*First groove*
108	*Table top*	**109**	*First locking hole*	**110**	*First connecting hole*	**112**	*First sliding groove*
113	*Closed end*	**114**	*First connecting surface*	**115**	*Positioning end*	**116**	*Positioning surface*

200	*Attachment main body II*	**201**	*Second connecting surface*	**202**	*Outer surface of the locking protrusion*	**203**	*Locking protrusion*
204	*Third connecting hole*	**205**	*Positioning groove*	**206**	*Upper embedded protrusion*	**207**	*First slide rail*
208	*Second slide rail*	**209**	*Through hole*	**210**	*Third connecting surface*	**211**	*Middle embedded protrusion*
212	*Lower embedded protrusion*	**213**	*Slot*				
300	*Locking insert*	**301**	*Insert chute*	**302**	*First locking pin*	**303**	*Raised positioning strip*
304	*Outer surface*	**305**	*Positioning bump*	**306**	*Inner surface of the locking pin*	**307**	*Second locking pin*

400	*First profile*	**401**	*Convex surface*	**402**	*L-shaped flange*	**403**	*Bent portion*
404	*Concave surface*	**405**	*Second U-shaped opening*	**406**	*First U-shaped opening*	**407**	*Concave cavity*
408	*Convex cavity*	**409**	*Embedded groove*	**410**	*Connecting wall*	**411**	*Second connecting hole*
412	*Rib*	**413**	*Bottom edge of the second U-shaped opening*				

500	*Second profile*	**501**	*Upper embedded cavity*	**502**	*Middle embedded cavity*	**503**	*Lower embedded cavity*
504	*Fourth connecting hole*	**505**	*Embedded cavity wall*				

Detailed Description of the Embodiments

[0044] The invention will be further described in details as below with reference to drawings and embodiments.

[0045] As shown in Fig.1 to Fig. 12, profiles of the embodiment in the invention comprise a first profile attached to a second profile via a profile attachment. The profile attachment of the embodiment in the invention consists of three parts, that is, an attachment main body I 100, an attachment main body II 200, and a locking component. The locking component prevents the attachment main body I from detaching from the attachment main body II. The first profile and the second profile are provided with components matched with the structure of the profile attachment

[0046] As shown in Fig. 1, on a front face of the attachment main body I 100, that is, a first connecting surface 114, is provided with a first sliding groove 112 with one end closed, and a slide table 110 in parallel to the first sliding groove 112. At the top of both side walls of the first sliding groove is a wall top part 101. Between the slide table 110 and the first sliding groove 112 is a first groove 106 for embedding a connecting wall 410, which is located between a convex cavity and a concave cavity of the first profile.

[0047] As shown in Fig. 5 to Fig. 6, on a second connecting surface 201 of the attachment main body 200 is provided

with a first slide rail 207 matched with the first sliding groove 112, and a second slide rail 208 matched with the slide table 110. On a third connecting surface 210, located on the back of the second connecting surface 201, is provided with an embedded protrusion that is matched with a cavity of the second profile. The moving direction of the embedded protrusion is perpendicular to the sliding direction of the first slide rail. During the attaching process, the first slide rail 207 is inserted from the open end of the first sliding groove 112. There are various structures for the attaching the first sliding groove 112 and the first slide rail 207, for example, raised strips may be disposed on both sides of the slide rail, and guide grooves are correspondingly disposed on both side walls of the sliding groove. In this embodiment, a dovetail block and a dovetail groove are adopted between corresponding surfaces of the first slide rail and the first sliding groove to realize the attaching of the first slide rail and the first sliding groove. The first sliding groove is in a structure of dovetail groove, and the first slide rail is in a structure of dovetail block matched with the dovetail groove.

[0048] As shown in Fig. 2, the first profile of this embodiment is provided with an embedded cavity for accommodating the attachment main body I. The embedded cavity comprises a concave cavity 407 and a convex cavity 408 formed at the end of the first profile, wherein the concave cavity matches with the slide table of the attachment main body I, and the convex cavity matches with the first sliding groove of the attachment main body I. The concave cavity 407 and the convex cavity 408 are formed by a side cavity wall of the first profile concaved inward, the concave cavity 407 and the convex cavity 408 have a concave surface 404 and a convex surface 401 corresponding thereto, respectively, and the concave surface is connected with the convex surface through a connecting wall 410. An embedded groove 409 is formed on the concave surface.

[0049] On the concave surface is provided with a first U-shaped opening 406 from which the slide table 110 protrudes. On the convex surface is provided with a second U-shaped opening 405 out of which the first sliding groove 112 expose, and two ribs 412 located on both sides of the second U-shaped opening. Said ribs 412 are used for blocking the wall top part 101 of the first sliding groove inside the convex cavity.

[0050] The first U-shaped opening 406 and the second U-shaped opening 405 may be formed during production process of the profiles, or, before assembling. During assembling, after the first sliding groove 112 of the attachment main body I is aligned with the second U-shaped opening, and the connecting wall 410 is aligned with the first groove 106, the attachment main body I is inserted into the cavity of the first profile. Thus the slide table can protrude outside of the concave cavity from the first U-shaped opening. The connecting wall 410 is embedded in the first groove 106, and the ribs 412 wrap the wall top part 101 of the first sliding groove, respectively. The first sliding groove 112 is exposed from the second U-shaped opening 405. An outer end face of a positioning end 115 at the end of the slide table 110 is located at the bottom of the first U-shaped opening, for the purpose of positioning. The tail end of the first sliding groove may also be not closed, that is, the first sliding groove does not have a closed end 113. During assembling, the attachment main body I and the attachment main body II are firstly embedded into the respective section bars, respectively, and then the attachment main body I is attached to the attachment main body II. When the first slide rail is inserted into the first sliding groove, the sliding direction of the first slide rail can be limited by the bottom edge 413 of the second U-shaped opening.

[0051] In order to prevent the attachment main body I, which has embedded into the embedded cavity of the first profile, from sliding out of the embedded cavity in the first profile, restricting structures may be disposed on both the attachment main body I and the wall of the cavity of the first profile. As shown in Fig. 1 to Fig. 2, in this embodiment, a first connecting hole 111 is disposed below the slide table of the attachment main body I, and correspondingly, a second connecting hole 411 is disposed below the first U-shaped opening of the first profile After the attachment main body I is embedded into the embedded cavity of the first profile, the attachment main body I and the first profile can be fastened by fasteners, like bolts, through the first connecting hole 111 and the second connecting hole 411. The restricting structure is not limited to this embodiment, and other restricting structures can also be applied. For example, a protrusion is disposed at the attachment main body I or the wall of the cavity of the first profile, while a positioning hole is provided on the other one.

[0052] In addition, in order to further limit the position of the attachment main body I, which has embedded into the embedded cavity of the first profile, another restricting structure may be further disposed between the side wall of the attachment main body I and the inner wall of the embedded cavity of the first profile. As shown in Fig. 1 to Fig. 2, in this embodiment, a second groove 104 is disposed on the attachment main body I, at the opposite side of the connecting surface I. Correspondingly, an L-shaped flange 402 is disposed on the inner cavity wall of the first profile, and a bent portion 403 of the L-shaped flange 402 is embedded into the second groove 104, so as to further limit the position of the attachment main body I at the back face of the connecting surface I.

[0053] As shown in Fig. 7 to Fig. 8, the second profile in this embodiment has an embedded cavity in which the embedded protrusion of the attachment main body II is inserted. In this embodiment of the invention, the embedded protrusion forms an L shape, consists of an upper embedded protrusion 206, a middle embedded protrusion 211, and a lower embedded protrusion 212, which are separately disposed. The upper embedded protrusion 206 is located at the bent end of the L shape. Matched with the embedded protrusion of the attachment main body II, the embedded cavity of the second profile also consists of an upper embedded cavity 501, a middle embedded cavity 502, and a lower

embedded cavity 503, which are separately disposed in an L shape, and the upper embedded cavity is located at the bent end of the L shape. The upper embedded cavity 501, the middle embedded cavity 502 and the lower embedded cavity 503 match with the upper embedded protrusion 206, the middle embedded protrusion 211 and the lower embedded protrusion 212, respectively. Given that the design of L-shaped embedded protrusions and embedded cavities in this embodiment is adopted, there may be multiple fitting faces between the embedded protrusions and the wall of the embedded cavity, so that the attachment main body II can be well fixed and attached to the corresponding profiles via the embedded protrusions.

[0054] The locking component is formed by inserting the locking protrusion 203 into the locking insert 300. The locking protrusion 203 is located on the third connecting surface 210 of the attachment main body II, and is opposite to the middle embedded protrusion 211. A slot 213 for the embedded cavity wall 505 of the second profile to embed therein is arranged between the locking protrusion and the middle embedded protrusion. When each embedded protrusion of the attachment main body II is inserted into corresponding embedded cavity of the second profile, said locking protrusion is exposed outside the embedded cavity wall 505.

[0055] An insert chute 301, matched with the locking protrusion, is disposed on a side surface of the locking insert. A locking pin is arranged at the front end of the locking insert. The attachment main body II is further provided with a positioning through hole, that is provided for the locking pin to protrude through the third connecting surface to the back face thereof, and that matches with the positioning component disposed on the attachment main body I. For the sake of effective positioning and convenient production, two positioning pins are provided in this embodiment, i.e., a first locking pin 302 and a second locking pin 307 extending forward along walls on both sides of the insert chute 301, respectively. Correspondingly, there are also two positioning through holes, i.e., through holes 209 located on both sides of the locking protrusion 203. On the attachment main body I is provided with a positioning component fitting with the positioning pin. As shown in Fig. 1, the positioning component comprises a first locking hole 109 disposed on one side of the slide table, and a positioning end 115 located at an end of the slide table. The first locking pin matches with the first locking hole, and the inner end face of the second locking pin 307 fits with the positioning surface 116 of the positioning end.

[0056] The positioning end 115 and the closed end 113 of the first sliding groove are located at the same side, and the slide table is shorter than the first chute. Directly using the positioning end as the positioning portion fitting with the second locking pin saves materials and facilitates processing, when compared with directly setting positioning hole, fitting with the second locking pin, on the slide table. Meanwhile, the design, in which the slide table is shorter than the first sliding groove, and a first connecting hole 111 may be further provided at the tail end of the slide table, that is, below the positioning end 115, also saves materials and facilitates processing.

[0057] After the locking protrusion is inserted into the locking insert, in order to prevent the locking insert from sliding out, locking pieces matched with each other may be disposed on the locking insert and the locking protrusion, respectively. For example, the locking protrusion may be provided with a positioning groove, and the locking insert is provided with a positioning bump matched with the positioning groove; or, the locking protrusion is provided with a positioning bump, and the locking insert is provided with a positioning groove matched with the positioning bump. Regarding the locking piece in this embodiment, a positioning groove 205 is disposed on a surface of the locking protrusion facing the insert chute 301, and the insert chute is provided with a raised positioning strip 303 matched with the positioning groove 205, and the raised positioning strip is provided with a positioning bump 305. In this way, a sound "click" will be heard when the locking insert 300 is inserted in position, and the positioning bump 305 falls into the positioning groove 205. In this way, the first locking pin 302 and the second locking pin 307 have been inserted into the positioning component disposed on the attachment main body I 100 by passing through the through holes 209, the locking protrusion 203 has been located inside the insert chute 301 disposed inside the locking insert 300, and the attachment main body I 100 and the attachment main body II 200 have been fastened as a whole.

[0058] In order to firmly connect the attachment main body II and the second profile together, a connecting structure may be further disposed on the second profile and the attachment main body II. In this embodiment, a third connecting hole 204 is provided on the locking protrusion, and correspondingly, a fourth connecting hole 504 is provided on the wall of the middle embedded cavity in the second profile. A fastener, like a bolt, passes through the third connecting hole 204 and the fourth connecting hole 504 to attach the attachment main body II to the second profile. Connecting holes corresponding to the third connecting hole 204 and the fourth connecting hole 504 may also be disposed on the side wall of the middle embedded protrusion which faces the locking protrusion. Connecting holes may not be provided, as the bolt has tightly resisted against the side wall of the middle embedded protrusion after passing through the third connecting hole 204 and the fourth connecting hole 504, it is able to attach the attachment main body II to the second profile quite firmly.

[0059] Various insertion connecting structures can be adopted for fastening the insert chute to the locking protrusion, for example, raised strips may be disposed on both sides of the locking protrusion, and guide grooves may be correspondingly disposed on both side walls of the chute. In this embodiment, a dovetail block and a dovetail groove are adopted between corresponding faces of the locking protrusion and the insert chute to realize the insertion fastening of

the locking protrusion and the insert chute. The insert chute is in a dovetail groove, and the locking protrusion is dovetail block matched with the dovetail groove. The first locking pin and the second locking pin are formed by extending the wall of the dovetail groove. The end face of the locking pin is a parallelogram, correspondingly, the through holes 209 and the first locking hole 109 are parallelograms matched with the end face of the locking pin. The positioning surface 116 located at the positioning end 115 of the slide table is a beveled surface matched with the end face of the locking pin.

[0060] In order to make the insertion connection position of the attachment main body I and the attachment main body II better wrapped by the first profile, in this embodiment, a table top 108 of the slide table is lower than a table top of the wall top part 101 of the first sliding groove. When the attachment main body I and the attachment main body II are connected in position, the second slide rail 208 on the attachment main body II is embedded into the embedded groove 409 to match with the slide table in a slide manner, and the first slide rail 207 is inserted into the first sliding groove. In this way, the insertion fastening position of the attachment main body I and the attachment main body II is wholly wrapped by the first profile, so that the attachment has better seal effect and looks nicer, since the attachment is invisible at the fastening position.

[0061] During the assembly of a shower enclosure, the first profile of the invention may be used as a vertical column, and the second profile may be used a beam.

[0062] The steps and method for attaching the profiles, the attachment, and the attaching structure thereof, will be specifically described referring to the embodiment as below.

[0063] Step one is to connect the attachment main body I with the first profile. After aligning the first sliding groove 112 of the attachment main body I to the second U-shaped opening of the first profile, and after aligning the connecting wall 410 to the first groove 106, the attachment main body I is embedded into the cavity of the first profile. At this time, the slide table protrudes outside the concave cavity from the first U-shaped opening and enters into the embedded groove 409. The connecting wall 410 is embedded into the first groove 106, the ribs 412 wrap the wall top part 101 of the first sliding groove. The opening of the first sliding groove 112 is exposed from the second U-shaped opening 405. The outer end face of the positioning end 115 at the end of the slide table 110 is located at the bottom of the first U-shaped opening, for a purpose of positioning. After the attachment main body I is embedded into the embedded cavity of the first profile, the attachment main body I and the first profile can be fixed by fasteners, like bolts, at the first connecting hole 111 and the second connecting hole 411, to prevent the attachment main body I from detaching from the first profile.

[0064] Step two is to connect the attachment main body II with the second profile. After aligning the upper embedded protrusion 206, the middle embedded protrusion 211 and the lower embedded protrusion 212 of the embedded protrusion 203 to the upper embedded cavity 501, the middle embedded cavity 502 and the lower embedded cavity 503 of the embedded cavity of the second profile 500,respectively, the attachment main body II is pushed forward, thus the embedded protrusion may be completely embedded into the embedded cavity of the second profile. After the embedded protrusion on the attachment main body II is embedded into the embedded cavity of the second profile, the attachment main body II and the second profile can be fixed by fasteners, like bolts, at the third connecting hole 204 and the fourth connecting hole 504, to prevent the attachment main body II from detaching from the second profile.

[0065] Step three is an initial connection of the profile attaching structure. During step one and step two, the attachment main body I has been attached to the first profile, and the attachment main body II has been attached to the second profile. Then, the first and second profile should be attached via the attachment main body I and II. Aligning the first slide rail 207 of the attachment main body II to the first sliding groove 112 of the attachment main body I, meanwhile, aligning the second slide rail 208 to the table top 108 of the slide table 110, the first slide rail 207 slides to the bottom of the first sliding groove 112. The first slide rail is prevented from sliding out of the first sliding groove via restriction of the closed end in the first sliding groove 112. In this way, the initial connection of the profile attaching structure is completed. At this time, the second slide rail 208 is also embedded inside the embedded groove 409, without interference with the slide table 110.

[0066] Step four is the locking of the profile attaching structure. Through above three steps the initial connection of the profile attaching structure has been completed. However, the profile attaching structure should be locked, for preventing from loosening. After aligning the insert chute 301 on the locking insert to the locking protrusion 203, and after aligning the first locking pin 302 and the second locking pin 307 to the through holes 209 on both sides of the locking protrusion 203, respectively, the locking insert slides forward, and the locking protrusion enters into the insert chute. Meanwhile, the first locking pin 302 and the second locking pin 307 pass through the respective through holes 209 to reach the second connecting surface and the third connecting surface. At this moment, an increased resistance for pushing forward the locking insert can be felt, it is indicated that the positioning bump 305 on the attachment main body I comes into contact with the locking protrusion. The locking insert is pushed forward continuously against the resistance to insert the first locking pin into the first locking hole 109 matched therewith, thus the second locking pin fits with the positioning surface 116 of the positioning end on the slide table. When a sound "click" is heard, it is indicated that the positioning bump 305 on the locking insert falls into the positioning groove 205 on the locking protrusion. In this case, the first locking pin 302 and the second locking pin 307 have passed through the through holes 209, and have been inserted into the positioning component disposed on the attachment main body I 100. The locking protrusion 203 has

been located inside the insert chute 301 disposed inside the locking insert 300, and the attachment main body I 100 and the attachment main body II 200 have been fixedly attached as a whole.

[0067] In this way, the assembling of the profile attaching structure is completed.

Claims

1. A profile attachment, comprising a attachment main body I (100) for connecting a first profile, a attachment main body II (200) for connecting a second profile, and a locking component for preventing the attachment main body I from detaching from the attachment main body II, the attachment main body I (100) and the attachment main body II (200) being provided with a first connecting surface (114) and a second connecting surface (201), respectively, which are matched with each other, at the back face of the second connecting surface (201) is provided with a third connecting surface (210);
   is **characterized in that**, a first sliding groove (112) and a slide table (110) in parallel to the first sliding groove are disposed on the first connecting surface (114), and a first groove (106) is arranged between the slide table (110) and the first sliding groove (112);
   the second connecting surface (201) is provided with a first slide rail (207) matched with the first sliding groove (112), and a second slide rail (208) matched with the slide table (110); and
   the third connecting surface (210) is provided with an embedded protrusion.

2. The profile attachment according to claim 1, **characterized in that** the attachment main body I (100) is further provided with a restricting structure for preventing the attachment main body I (100) from sliding out of an embedded cavity of the first profile.

3. The profile attachment according to claim 2, **characterized in that** the locking component is formed by inserting a locking protrusion (203) into a locking insert (300), the locking protrusion (203) is located on the third connecting surface (210), and a slot (213) is arranged between the locking protrusion (203) and the embedded protrusion; an insert chute (301) matched with the locking protrusion (203) is disposed on a side surface of the locking insert (300), locking pins are arranged on the front end of the locking insert, the attachment main body II is provided with through holes (209) for the locking pins to pass through and reach the back face of the third connecting surface from the third connecting surface, and the attachment main body I is provided with a positioning component fitting with the locking pin.

4. The profile attachment according to claim 3, **characterized in that** the locking insert and the locking protrusion are provided with locking pieces matched with each other, respectively.

5. The profile attachment according to claim 4, **characterized in that** the locking pieces matched with each other refer to a positioning groove (205) disposed on the locking protrusion and a positioning bump (305) disposed on the locking insert, or, a positioning bump disposed on the locking protrusion and a positioning groove disposed on the locking insert.

6. The profile attachment according to claim 4, **characterized in that** the table top (108) of the slide table (110) is lower than the table top of a wall top part (101) of the first sliding groove.

7. The profile attachment according to claim 3, **characterized in that** there are two locking pins including a first locking pin (302) and a second locking pin (307) extending forward along walls on both sides of the insert chute (301), respectively; and correspondingly, there are two through holes (209) located on both sides of the locking protrusion, respectively.

8. The profile attachment according to claim 4, **characterized in that** a tail end of the first sliding groove is a closed end (113).

9. The profile attachment according to claim 7, **characterized in that** the positioning component on the attachment main body I comprises a first locking hole (109) disposed on the slide table (110) and a positioning end (115) located at an end of the slide table (110), the first locking pin (302) matches with the first locking hole (109), and the inner end face of the second locking pin (307) fits with the positioning face (116) of the positioning end (115); and, the restricting structure on the attachment main body I (100) is a first connecting hole (111) located below the positioning end of the slide table.

10. The profile attachment according to any one of claims 1-9, **characterized in that**, given that the first connecting surface of the attachment main body I is the front face, a positioning portion, matched with the positioning structure on a wall of the inner cavity of the profile, is further arranged on a side wall on both sides or back face of the attachment main body I.

11. The profile attachment according to any one of claims 3-9, **characterized in that**, the locking protrusion (203) is provided with a third connecting hole (204).

12. The profile attachment according to claim 11, **characterized in that**, the embedded protrusion consists of an upper embedded protrusion (206), a middle embedded protrusion (211) and a lower embedded protrusion (212), which are separately disposed in an L shape, the upper embedded protrusion is located at the bent end of the L shape, and the locking protrusion (203) is disposed opposite to the middle embedded protrusion.

13. The profile attachment according to claim 11, **characterized in that**, both the first sliding groove (112) and the insert chute (301) are dovetail grooves, and correspondingly, the first slide rail (207) and the locking protrusion (203) respectively matched therewith are in a structure of dovetail blocks.

14. A profile, comprising an embedded cavity for the attachment main body I as mentioned in claim 1 to be embedded therein, is **characterized in that**, the embedded cavity comprises: a concave cavity (407) and a convex cavity (408), a concave surface (404) and an embedded groove (409) corresponding to the concave cavity, and a convex surface (401) corresponding to the convex cavity (408), the concave surface (404) is connected with the convex surface (401) via a connecting wall (410), a first U-shaped opening (406) is provided on the concave surface (404) located at an end of the profile, and a second U-shaped opening (405) and ribs (412) located on both sides of the second U-shaped opening are provided on the convex surface (401) located at the end of the profile.

15. The profile according to claim 14, **characterized in that**, a restricting structure, for preventing the embedded member in the embedded cavity from sliding out of the embedded cavity, is arranged on a wall of the concave cavity or of the convex cavity located at the end of the profile.

16. The profile according to claim 15, **characterized in that**, the limiting structure on the wall of the concave cavity or the convex cavity is a second connecting hole (411) disposed below the first U-shaped opening (406).

17. The profile according to claim 14 or 15 or 16, **characterized in that**, given that the cavity wall on one side of the U-shaped opening is the front face, a positioning structure, for positioning the embedded member that is embedded into the embedded cavity, is arranged on an inner wall of the embedded cavity on the left or right side or the back face of the profile.

18. The profile according to claim 17, **characterized in that**, the positioning structure is an L-shaped flange (402) located on the inner wall of the embedded cavity on the left or right side of the profile, and the bent portion (403) of the L-shaped flange faces one side of the U-shaped opening.

19. A profile attaching structure, comprising a first profile (400), a second profile (500), and an attachment for attaching the first profile to the second profile, said attachment comprising an attachment main body I (100) for connecting a first profile, an attachment main body II (200) for connecting a second profile, and a locking component for preventing the attachment main body I from detaching from the attachment main body II, the attachment main body I (100) and the attachment main body II (200) being respectively provided with a first connecting surface (114) and a second connecting surface (201), which are matched with each other, and at the back face of the second connecting surface (201) is a third connecting surface (210), is **characterized in that**,
the first profile comprises an embedded cavity for the attachment main body I to be embedded therein, the embedded cavity comprises a concave cavity (407) and a convex cavity (408), and a concave surface (404) and an embedded groove (409) corresponding to the concave cavity, and a convex surface (401) corresponding to the convex cavity (408), and the concave surface (404) is connected with the convex surface (401) via a connecting wall (410); and the first connecting surface (114) of the attachment main body I is provided with a first sliding groove (112) matched with the convex cavity and a slide table (110) which is in parallel to the first sliding groove and matches with the concave cavity, and a first groove (106) matched with the connecting wall (410) is disposed between the slide table (110) and the first sliding groove (112);
the concave surface (404) located the end of the profile is provided with a first U-shaped opening (406) for the slide table (110) to protrude from, and the convex surface (401) located the end of the profile is provided with a second

U-shaped opening (405) for the first sliding groove (112) to expose from and ribs (412) located on both sides of the second U-shaped opening for blocking the wall top part of the first sliding groove inside the convex cavity;
the second connecting surface (201) of the attachment main body II is provided with a first slide rail (207) matched with the first sliding groove (112) and a second slide rail (208) matched with the slide table (110), the third connecting surface (210) is provided with an embedded protrusion, and the second profile is provided with an embedded cavity matched with the embedded protrusion.

20. The profile attaching structure according to claim 19, is **characterized in that** the attachment main body I (100) is provided with a restricting structure for preventing the attachment main body I from sliding out of the embedded cavity of the first profile, and correspondingly, a limiting portion matched with the restricting structure of the attachment main body I is arranged on the wall of the embedded cavity of first profile.

21. The profile attaching structure according to claim 20, **characterized in that** the locking component is formed by inserting a locking protrusion (203) into a locking insert (300), the locking protrusion (203) is located on the third connecting surface (210), and a slot (213) for embedment of the wall (505) of the embedded cavity of the second profile is arranged between the locking protrusion (203) and the embedded protrusion; and, an insert chute (301) corresponding to the locking protrusion (203) is disposed on a side surface of the locking insert (300), locking pins are arranged on the front end of the locking insert, the attachment main body II is provided with through holes (209) for the locking pins to pass through and reach the back face of the third connecting surface from the third connecting surface, and the attachment main body I is provided with a positioning component fitting with the locking pins.

22. The profile attaching structure according to claim 21, **characterized in that** the locking insert and the locking protrusion are respectively provided with locking pieces matched with each other.

23. The profile attaching structure according to claim 22, **characterized in that** the locking pieces matched with each other refer to a positioning groove (205) disposed on the locking protrusion and a positioning bump (305) disposed on the insert chute of the locking insert, or, a positioning bump disposed on the locking protrusion and a positioning groove disposed on the insert chute of the locking insert.

24. The profile attaching structure according to claim 23, **characterized in that** there are two locking pins including a first locking pin (302) and a second locking pin (307) extending forward along walls on both sides of the insert chute (301), respectively; and correspondingly, there are two through holes (209) located on both sides of the locking protrusion (203), respectively.

25. The profile attaching structure according to claim 24, **characterized in that** the positioning component on the connecting piece main body I comprises a first locking hole (109) disposed on the slide table (110) and a positioning end (115) located at an end of the slide table (110), the first locking pin (302) matches with the first locking hole (109), and the inner end face of the second locking pin (307) fits with the positioning face (116) of the positioning end (115); and, the limiting structure on the connecting piece main body I (100) is a first connecting hole (111) located below the positioning end of the slide table, and the limiting portion on the first profile is a second connecting hole (411) disposed below the first U-shaped opening (406).

26. The profile attaching structure according to claim 22, **characterized in that** the table top (108) of the slide table (110) is lower than the table top of a wall top part (101) of the first sliding groove; and the second slide rail (208) on the connecting piece main body II is embedded into the embedded groove (409).

27. The profile attaching structure according to claim 22, **characterized in that** a tail end of the first sliding groove is a closed end (113).

28. The profile attaching structure according to any one of claims 19-27, **characterized in that** given that the connecting surface I of the connecting piece main body I is the front face, a positioning portion, matched with the positioning structure on a wall of the inner cavity of the profile, is further arranged on a side wall on both sides or back face of the connecting piece main body I.

29. The profile attaching structure according to any one of claims 21-27, **characterized in that** the locking protrusion (203) is provided with a third connecting hole (204), and a fourth connecting hole (504) matched with the third connecting hole (204) is arranged on the wall (505) of the embedded cavity of the second profile that is embedded into the slot (213).

30. The profile attaching structure according to claim 29, **characterized in that** the embedded protrusion consists of an upper embedded protrusion (206), a middle embedded protrusion (211) and a lower embedded protrusion (212), which are separately disposed in an L shape, the upper embedded protrusion is located at the bent end of the L shape, and the locking protrusion (203) is disposed opposite to the middle embedded protrusion; and, the embedded cavity of the second profile comprises an upper embedded cavity (501), a middle embedded cavity (502) and a lower embedded cavity (503), which are also separately disposed in an L shape and match with the upper embedded protrusion (206), the middle embedded protrusion (211) and the lower embedded protrusion (212), respectively, and the upper embedded cavity is located at the bent end of the L shape.

31. The profile attaching structure according to claim 30, **characterized in that** both the first sliding groove (112) and the insert chute (301) are dovetail grooves, and correspondingly, the first slide rail (207) and the locking protrusion (203) respectively matched therewith are in a structure of dovetail blocks.

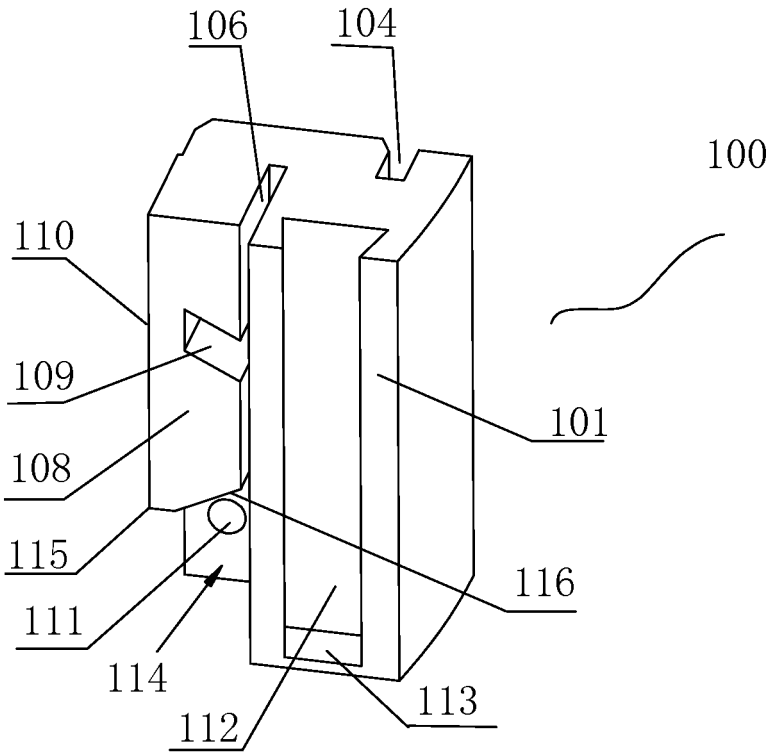

FIG 1

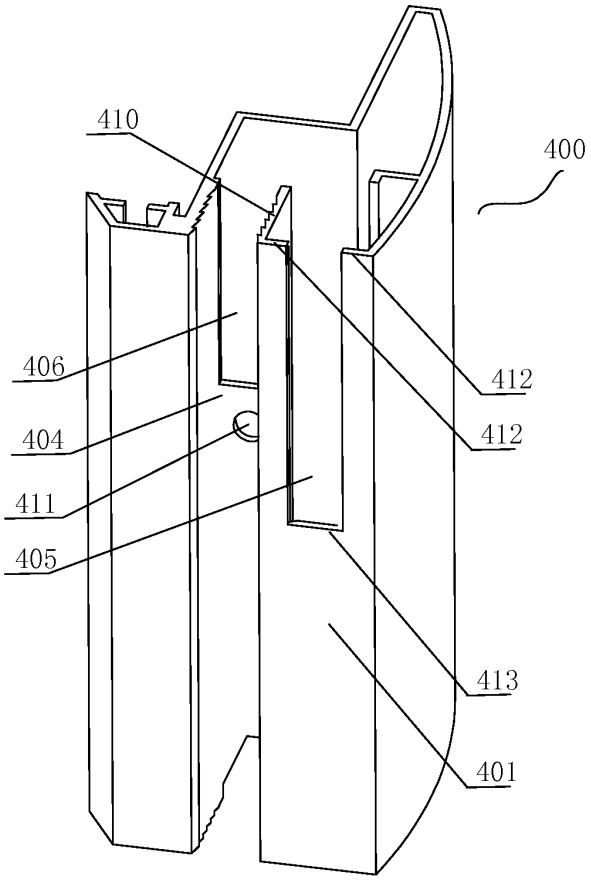

FIG 2

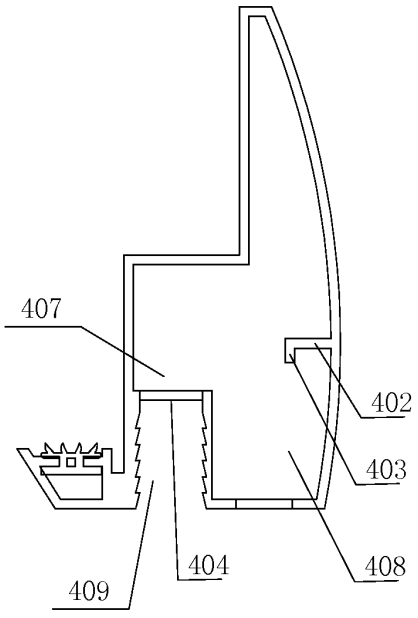

FIG 3

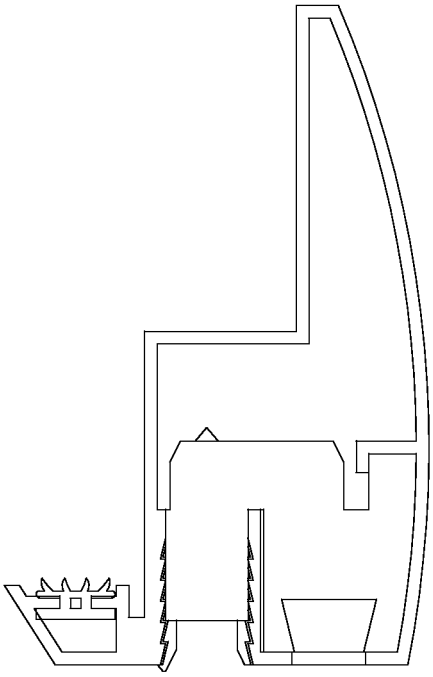

FIG 4

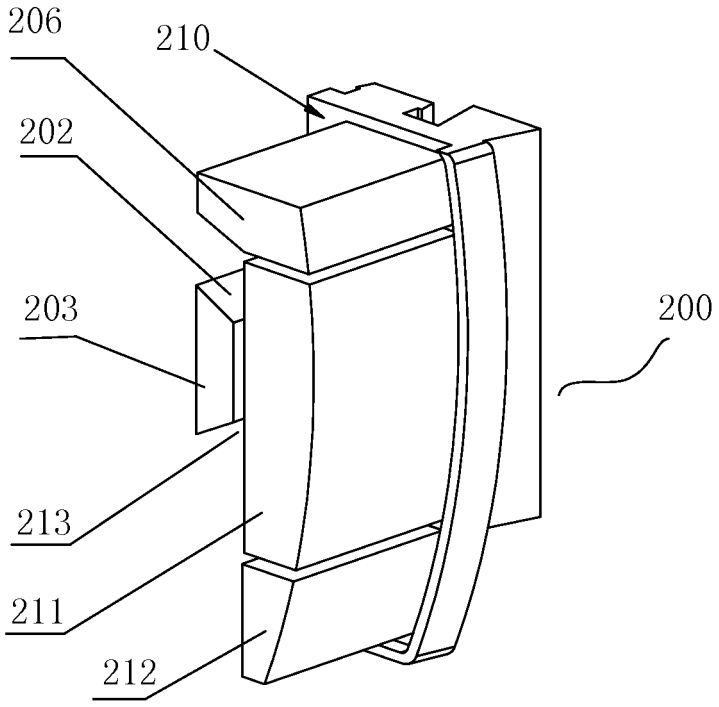

FIG 5

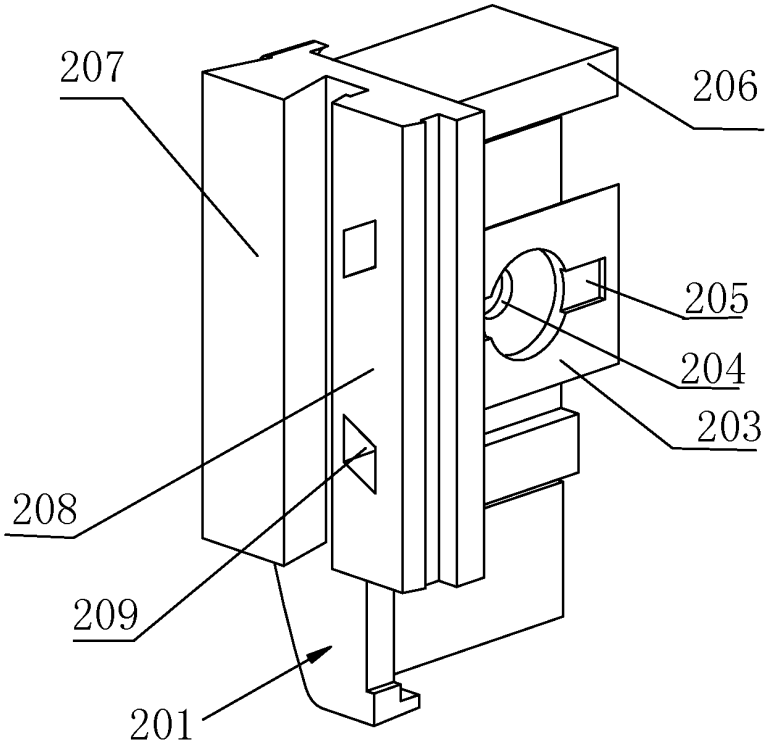

FIG 6

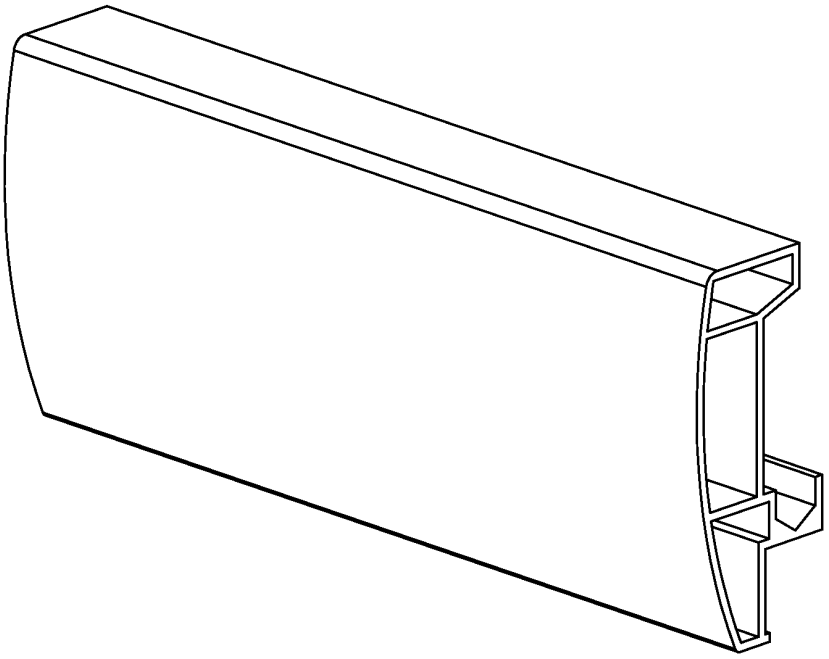

FIG 7

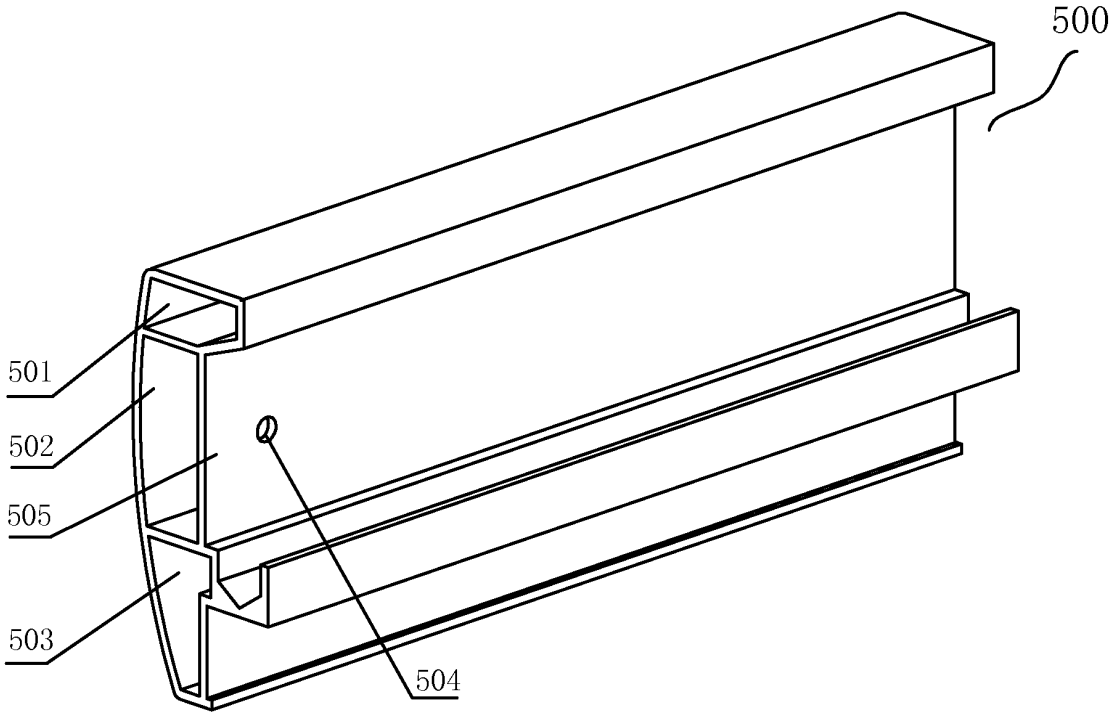

FIG 8

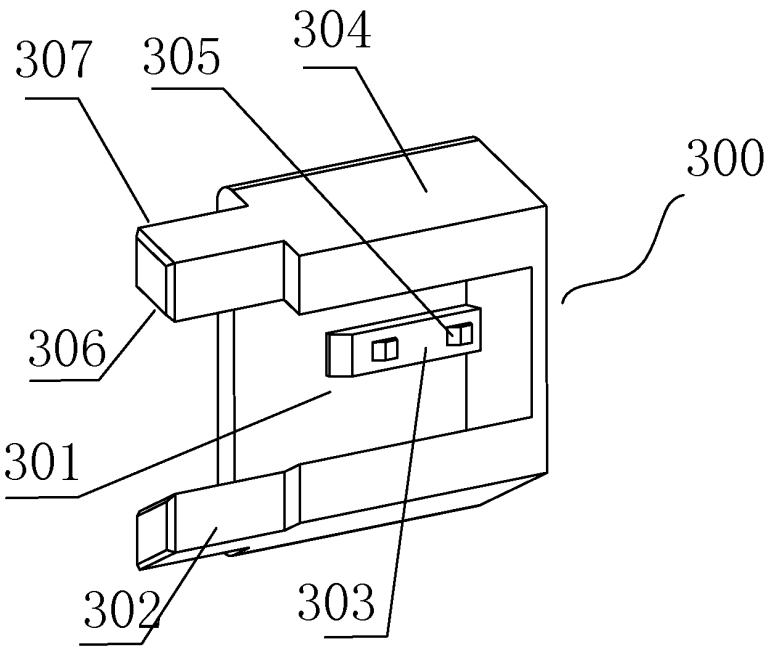

FIG 9

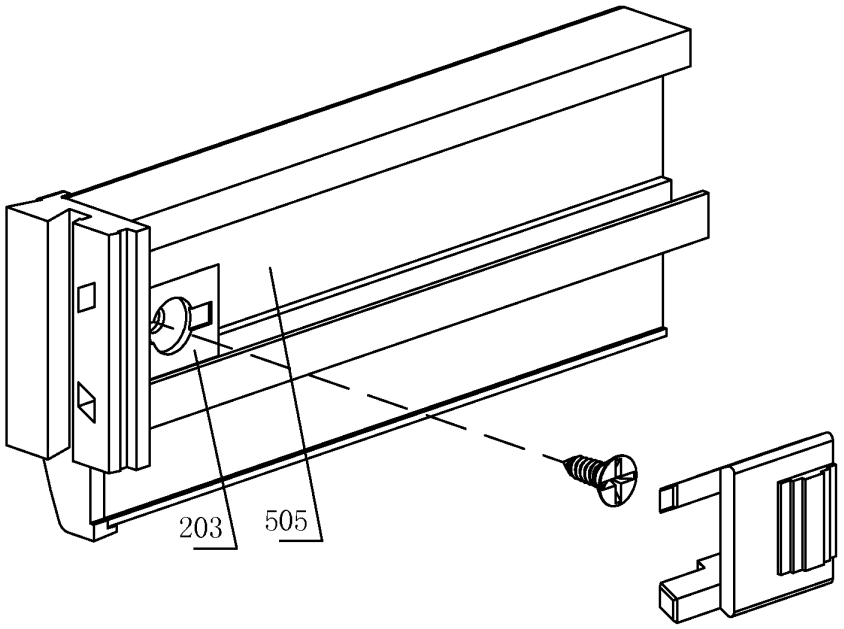

FIG 10

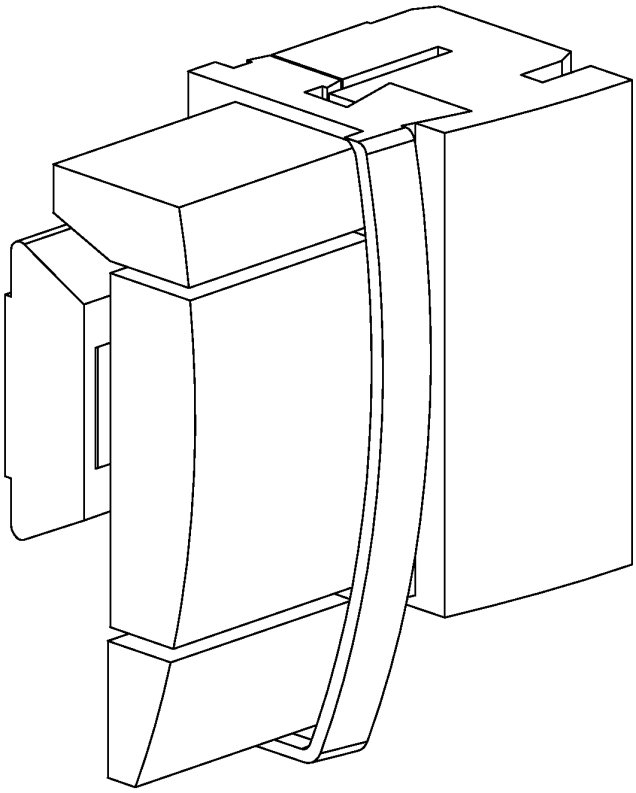

FIG 11

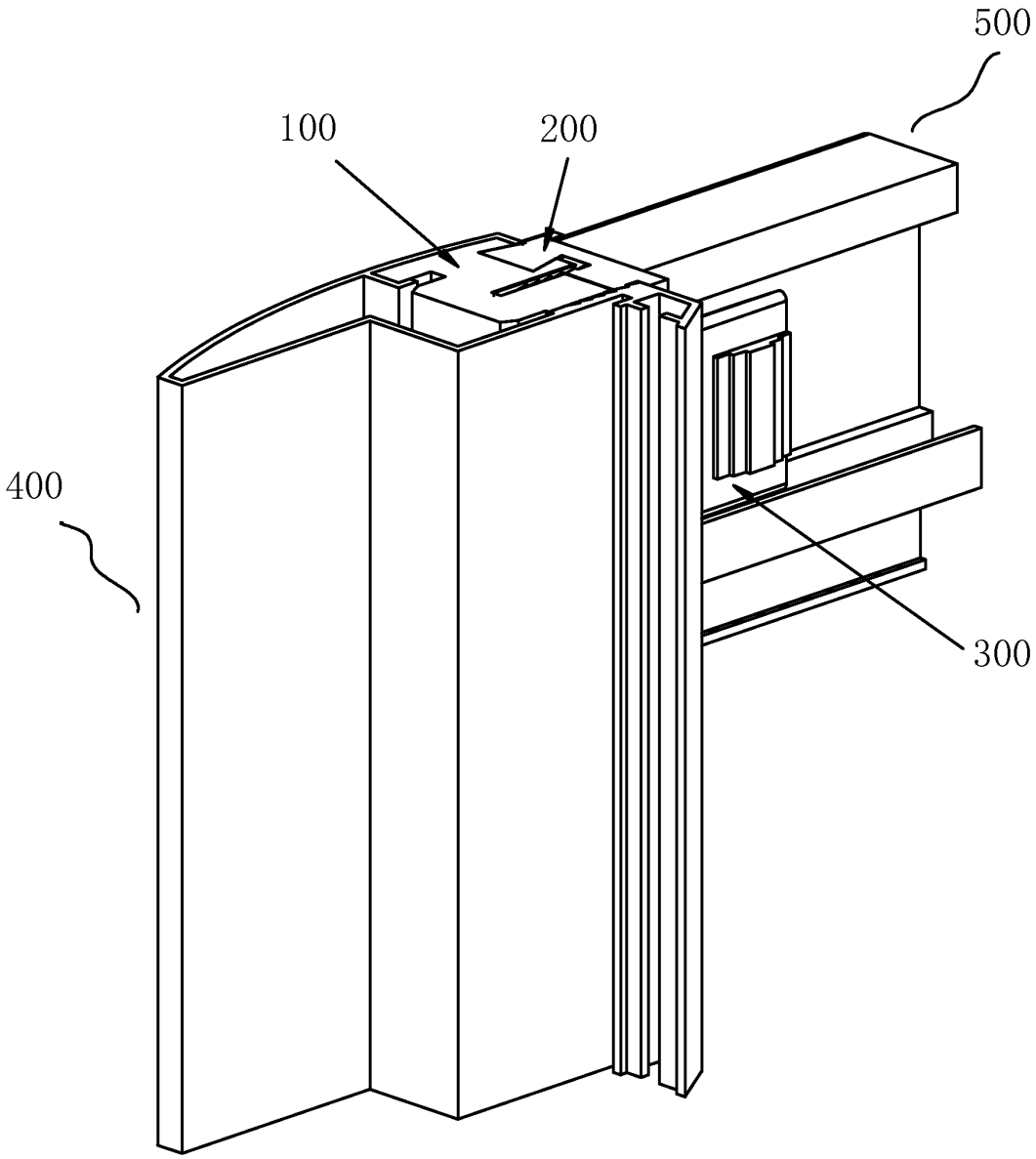

FIG 12

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2011/001987

A. CLASSIFICATION OF SUBJECT MATTER

See the extra sheet

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)

IPC: E04B, E04H, A47K

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)

CNPAT, CNKI, EPODOC, WPI: connect+, join+, link+, groov+, slot+, trough+, lock+, profiled

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN201059417Y (NINGBO OUTEJIE HEALTH SANITARY), 14 May 2008 (14.05.2008), description, page 2, line 30 to page 3, line 27 and figures 1-6	1-31
A	CN201059020Y (NINGBO OUTEJIE HEALTH SANITARY), 14 May 2008 (14.05.2008), description, page 1, line 18 to page 2, line 33 and figures 1-6	1-31
A	WO2007129320A2 (PALRAM INDUSTRIES (1990) LTD.), 15 Nov. 2007 (15.11.2007), the whole document	1-31
PX	CN102022011A (HANGZHOU CLEAN DELL SANITARY WARE CO LTD), 20 Apr. 2011 (20.04.2011), claims 1-31	1-31
PX	CN201891276U (HANGZHOU CLEAN DELL SANITARY WARE CO LTD), 06 Jul. 2011 (06.07.2011), claims 1-13	19-31

☒ 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
22 Feb. 2012 (22.02.2012)	08 Mar. 2012 (08.03.2012)

Name and mailing address of the ISA	Authorized officer
State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451	GUO, Weijuan Telephone No. (86-10)62084877

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2011/001987

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN201892024U (HANGZHOU CLEAN DELL SANITARY WARE CO LTD), 06 Jul. 2011 (06.07.2011), claims 1-5	14-18

Form PCT/ISA /210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2011/001987

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN201059417Y	2008-05-14	NONE	
CN201059020Y	2008-05-14	NONE	
WO2007129320A2	2007-11-15	WO2007129320A3	2009-04-09
CN102022011A	2011-04-20	NONE	
CN201891276U	2011-07-06	NONE	
CN201892024U	2011-07-06	NONE	

Form PCT/ISA /210 (patent family annex) (July 2009)

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A. CLASSIFICATION OF SUBJECT MATTER

E04B1/58 (2006.01) i
E04H1/12 (2006.01) n
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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 200720111895 A **[0008]**
- CN 201059417 Y **[0008]**