

--1--

DOOR HAVING A FRAME IN WHICH A SLIDING PIECE IS MOUNTED

This invention relates to a door with a frame provided therearound, and more particularly to a door wherein said frame has a guiding channel and a slidable connecting member mounted therein.

Referring to Fig. 1, a glass door 1 is provided with a frame 2 for mounting said door to a fixing seat 5 installed in a wall 6. The frame 2 has a guiding channel which is divided into an upper section 22 and a lower section 23 by means of a partition plate 21. A connecting member 3 is screwed to said partition plate 21 in the upper section 22 of the frame 2. To affix the frame 2 to the upper side of the glass door 1, a silicone rubber 11 is applied in the lower section 23 of the frame 2. A mounting plate 4 is screwed to the connecting member 3 and has a mounting hole 42 formed therein. The mounting plate 4 is arranged so that a pivot pin 51, which is fixedly mounted in the fixing seat 5, can be inserted into the mounting hole 42 when the door 1 is positioned properly. Another frame is mounted to the lower side of the door in a similar manner with a similar structure. In this way, the door 1 can be pushed or pulled to rotate about the pivot pin 51 to an opened or closed position. However, the abovementioned known door suffers from some disadvantages in that, because the connecting member 3 and the mounting plate 4 are fixed to the frame 2 and

the fixing screws 31 for fixing the connecting member 3 are sealed in the silicon rubber 11, the relative positions among the pivot pin 51 of the fixing seat 5, the mounting plate 4 and the connecting member 3 must be precisely predetermined in order to enable the pivot pin 51 to align with and insert into the mounting hole 42. A correction must be made when said relative positions are incorrect. That is, the screws 31 must be removed and then screwed into another proper position after the relative positions of the connecting member 3, the mounting plate 4 and the pivot pin 51 of the fixing seat 5 are rearranged to their respective correct relative positions. Such a correction is messy and may result in damage to parts of the door. It has been found that an automatic door which has a structure similar to that of the abovementioned door suffers from the same disadvantages.

It is therefore a main object of this invention to provide a door having a frame in which a slide piece is mounted so that the proper mounting position of the door can be easily achieved.

Accordingly, a system for mounting an end of a door to an engaging member mounted in an opening in a wall for moving the door relative to the engaging member, comprising:

a frame member engaging the end of the door, the frame member having an H-shaped cross-section configured to form therein a first guide channel for receiving an end of the door and a second guide channel having opposed guide rails protruding inwardly from its inner sides; an elongate slide piece disposed in the second guide channel on one side of the guide rails for slidable longitudinal movement relative to the frame member; a

connecting member having an inverted U-shape with intermediate horizontally-oriented end portions disposed in the second guide channel on the side of said guide rails opposite said one side, means including a mounting plate secured to the outer surface of the connecting member and having support means projecting therefrom for mounting the door and adapted to be received by the engaging member; and screw means interconnecting the connecting member and the slide piece for releasably clamping them against the guide rails for immobilizing the slide piece at an adjusted position relative to the channel at which the support means correctly engages the engaging member.

In one preferred embodiment of a system according to the present invention there is provided a mounting plate detachably secured to the outer surface of the intermediate portion of the connecting member and having a pivot pin projecting for defining a pivot axis of the door and adapted to be received and journaled in the engaging member.

In alternative embodiment of a system according to the present invention there is provided a mounting plate detachably secured to the outer surface of the intermediate portion of a connecting member, the mounting plate being at least two arms substantially at right angles thereto, the support means comprising a cylindrical support member mounted on one arm of the mounting plate to enable the door to move in a direction parallel to the longitudinal axis of the engaging member along which the support member is arranged to move.

Other features and advantages of this invention will become apparent in the following detailed description of

the preferred embodiments of this invention with reference to the accompanying drawings, in which:

Fig. 1 is a sectional view of a portion of a conventional glass door;

Fig. 2 is an exploded perspective view of a preferred embodiment of the system applied to a door in accordance with the present invention;

Fig. 3 is a sectional side view of a preferred embodiment of a frame portion for a door in accordance with the invention;

Fig. 4 is a sectional front view of a preferred embodiment of a system applied to a door in accordance with the present invention, and

Fig. 5 is a sectional front view of another preferred embodiment of a system according to the present invention.

Referring to Fig. 2, an exploded perspective view of a preferred embodiment of the parts of a door according to the present invention is shown. The door includes a frame 10, a slide piece 20 provided in the frame 10, a cover 15 mounted to the side of the frame 10 and a connecting member 30 mounted in the frame 10. The frame 10 is formed with two vertical plates 102 and a partition plate 101 connected between said two vertical plates 102 thereby defining an upper section 12 and a lower section 13 for mounting frame 10 on to a portion of the glass panel 1 (see Fig. 4). In the upper section 12 of the frame 10, two opposing guide rails 121 inwardly protrude from the inner surface of the frame 10 along the length of the frame 10. A long opening 122 is formed between the opposing guide rails 121. In this respect, the upper section 12 of the frame 10 is generally divided into an upper channel portion 124 in which the connecting member 30 is mounted and a lower channel portion 125 for receiving the slide piece 20. In addition, each of the guide rails 121 has a long groove 123 formed in the bottom side thereof and the slide piece 20 has two long protrusions 201 correspondingly projecting therefrom so as to slidably engage with said grooves 123. The slide piece also has an arcuate member 202 integrally formed on the upper portion thereof parallel to the length of the long protrusions 201. The cover 15 has two wing members 151

extended therefrom for clamping onto the vertical plates 102 of the frame 10 respectively.

Referring to Fig. 3, a sectional side view of the frame portion of the door is shown. The slide piece 20 is slidably provided in the lower channel portion 125 with the protrusions 201 fitting into the grooves 123 of the guide rails 121. The connecting member 30 is placed on the guide rails 121 in the upper channel portion 124 of the frame 10. Two screws 9 respectively pass through the sides of the connecting member 30 and the opening 122 into the arcuate member 202 of two slide pieces 20 so as to interconnect the connecting member 30 and the slide pieces 20, respectively, thus immobilizing the slide pieces 20.

Referring to Fig. 4, after the slide pieces 20 are connected with the connecting member 30 and immobilized by the screws 9, the connecting member 30 is attached to a mounting plate 40. The mounting plate 40 is engagable with a pivot pin 51 of a fixing seat 50 which is fixed in the wall in a conventional way. The cover 15 is then mounted to the side of the frame 10 with the wing members 151 clamping onto the vertically oriented plates 102. Finally, a screw 152 passes through cover 15 into the slide piece 20 so as to fix said cover 15 to the frame 10. In this way, the whole mounting operation of the door is completed.

During the mounting operation of the door, if the

relative positions of the mounting plate 40 and the pivot pin 51 of the fixing seat 50 are incorrect, thus preventing the pivot engaging with the mounting plate 50, the user can release the screws 9 so as to move the slide piece 20 and the connecting member 30 to a predetermined position where the mounting plate 40 and said pivot pin 51 of said fixing seat 50 may properly engage with each other. The screws 9 then are screwed downward to immobilize the slide piece 20. It is noted that the screws 9 of this invention are screwed down into the slide piece 20 from the upper side of the connecting member 30, while the conventional fixing screws for connecting the frame and the connecting member which are screwed upwardly thereinto from the lower section 13 of the frame 10, are sealed in the silicon rubber and therefore cannot be released for adjusting purpose. Therefore, only the screws 9 can be conveniently released for adjusting.

Referring to Fig. 5, a sectional view of another preferred embodiment of this invention used with an automatic door is shown. The automatic door has a engaging seat 8 bolted to the connecting member 39. A slide piece 29 is connected with the connecting member 39 by screws 91 in a manner similar to the first embodiment. Therefore, the connecting member 39 may also be moved to a predetermined position so that the automatic door can be properly mounted. The door

also has a cover 16 screwed to the slide piece 29 by a screw 161 which is similar to the one in the first embodiment.

5        With this invention thus explained, it is apparent that numerous modifications and variations can be made without departing from the scope of this invention. It is therefore intended that this invention be limited only as indicated in the appended claims.



9

CLAIMS:

1. A system for mounting an end of a door to an engaging member mounted in an opening in a wall for moving the door relative to the engaging member, comprising:

a frame member engaging the end of the door, the frame member having an H-shaped cross-section configured to form therein a first guide channel for receiving an end of the door and a second guide channel having opposed guide rails protruding inwardly from its inner sides;

an elongate slide piece disposed in the second guide channel on one side of the guide rails for slidable longitudinal movement relative to the frame member;

a connecting member having an inverted U-shape with intermediate horizontally-oriented end portions disposed in the second guide channel on the side of said guide rails opposite said one side, means including a mounting plate secured to the outer surface of the connecting member and having support means projecting therefrom for mounting the door and adapted to be received by the engaging member; and

screw means interconnecting the connecting member and the slide piece for releasably clamping them against the guide rails for immobilizing the slide piece at an adjusted position relative to the channel at which the support means correctly engages the engaging member.

2. A system as claimed in claim 1, wherein each of the guide rails has a longitudinal groove formed in one side thereof, and wherein the slide piece has parallel longitudinal protrusions formed thereon configured to fit into the grooves of a respective guide rail.



3. A system as claimed in claim 1, wherein the slide piece has an arcuate surface configured to fit into the space defined by the opposed guide rails and in which is formed an elongate groove in which the screw means is fastened.

4. A system as claimed in claim 1, wherein the system further comprises:

a cover member having two wing members extending therefrom and spaced apart by a distance substantially equal to the thickness of the frame member, and means for attaching said cover member to an end of the frame member.

5. A system as claimed in claim 1, wherein the elongated frame member has an H-shaped cross section defined by a pair of side plates interconnected by a transversely extending partition plate to form the first and second guide channels on opposite sides of the partition plate and is configured to receive in its first guide channel an end of the door, the second guide channel having opposing guide rails protruding inwardly from the inner surface of the side plates in spaced, parallel relationship with the partition plate to divide the second guide channel into first and second portions.

6. A system as claimed in claim 5, wherein the connecting member of the frame member has an inverted U-shape and end portions extending outwardly transversely from the free ends thereof, the connecting member being disposed, in the first portion of the second guide channel of the frame member with its end portions



11

supported on the surfaces of the guide rails opposite the said one side, the end portions of the connecting member having an opening therethrough for receiving a screw therein.

7. A system as claimed in claim 6, including a pair of screws for the connecting member each having a head and extending through a respective end portion opening, through the space defined by the opposing edges of the said guide rails, and threadably engaging the groove formed in the slide piece for releasably clamping the connecting member and slide piece against the guide rails for immobilizing the connecting member, the heads of the screws being accessible without interference from a door received in the first guide channel for enabling convenient adjustment of the position of the connecting member relative to the door to achieve proper engagement of the said support means projecting therefrom with the engaging member.

8. A system as claimed in claim 5, 6 or 7, including a mounting plate detachably secured to the outer surface of the intermediate portion of the connecting member and having a pivot pin consisting the support means projecting therefrom for defining a pivot axis of the door and adapted to be received and journaled in the engaging member.

9. A system as claimed in claim 5, 6 or 7, including a mounting plate detachably secured to the outer surface of the intermediate portion of the connecting member, the mounting plate being of at least two arms substantially at right angles thereto, the support means comprising a cylindrical member mounted on one arm of the mounting



plate to enable the door to move in a direction parallel to the longitudinal axis of the engaging member along which the support member is arranged to move.

10. A door mounting system substantially as hereinbefore described with reference to, and as illustrated in, Figs. 2 to 4; or Fig. 5 of the accompanying drawings.

---