

SPECIFICATION

Multi-panel sliding doors and components therefor

5 This invention relates to multi-panel sliding doors or the like; and parts and components therefor. Typical of this kind of assembly are sliding doors having one fixed panel and a series of sliding panels which, when fully extended, close a shower compartment
10 off. The invention will be described below with reference to such a sliding door though it may clearly apply to other structures such as sliding windows or partitions.

In this type of assembly, the sliding panels are
15 usually suspended on rollers running in a channel on the frame. Adjustment of the height of the roller above the panels is necessary to compensate for slight differences in the frame construction and installation.

20 According to the present invention, there is provided a roller carriage for multi-panel sliding doors or the like including a substantially L-shaped body, a rocker arm pivotally mounted on the body, the rocker arm being generally C-shaped to provide two
25 arms, one on each side of the pivotal mounting, a cam surface on one arm of the rocker arm, a roller rotatably mounted on the other arm of the rocker arm and adjustment means on the body engaging the cam surface to vary the distance of the roller
30 from the body, the L-shaped body having two legs one adapted to engage and support a top rail and the other adapted to engage and support a stile of a panel butt-jointed together in a spaced relationship.

The invention also provides a roller carriage
35 wherein the body is adapted to engage a rail and a stile of a panel butt-jointed together in a spaced relationship.

To enable the invention to be more fully understood, a preferred embodiment will now be described with reference to the accompanying drawings in which:-

Figure 1 is a horizontal view of a sliding door for a shower compartment;

Figure 2 is a vertical sectional view of a sliding
45 door;

Figure 3 is a side view of the roller carriage parts being shown in dotted lines for clarity;

Figure 4 is a perspective view of a guide corner support which forms the specific subject matter of
50 our copending divisional patent application No. 7941263; and

Figure 5 is a perspective view of a stop corner support.

The sliding door has a front wall 10 with a first side
55 frame 11 fixed to a wall 12, and a second side frame 13 connected to an end wall 14 of the door by an extruded jointpiece 15. The side frames 11, 13 are interconnected by a sill frame 16 and head frame 17. The sill frame 16 has an outer vertical flange 18; an
60 inner vertical flange 19 and crosspiece 20. The outer flange 18 is terminated by an inverted channel section 21.

The headframe 17, of inverted channel section, has an outer vertical flange 22a and an inner vertical
65 flange 22b. The flanges 22a, 22b are provided with

channel tracks 23, 24 respectively and outer flange 22a is terminated by an turned lip 25. Anti-jumpoff rails 17a, 17b are provided above the channel tracks 23, 24 respectively.

70 The sliding door has a fixed inner panel 26, a sliding centre panel 27 and sliding outer panel 28, each fitted with a pane of reinforced or toughened glass 29 held in position by a suitable P.V.C. or rubber sealing strip 30.

75 As shown in Figure 1, the stiles 31 of the panels 26, 27, 28 are substantially U-shaped channels with inner flanges 32 spaced intermediate of the legs of the stiles.

The rails 33 of the panels 26, 27, 28 are shown in
80 Figure 2 and are substantially H-shaped in cross-section having a cross-piece 34 provided with groove 35.

The stiles 31 and rails 33 are preferably formed from aluminium extrusions cut to the required
85 length.

The sliding centre panel 27 and sliding outer panel 28 are supported by rollers 36 which run in the channel tracks 23, 24 of the head frame 17. The rollers 36 are mounted on roller carriages 37 fitted at
90 the upper corners of the sliding panels 27, 28 in the manner to be hereinafter described.

Referring to Figure 3, each roller carriage 37 has a body 38 with an aperture 39 therethrough. The body 38 is substantially L-shaped in that it has two legs, one adapted to engage and support the top rail of the panel and the other adapted to engage and support a stile of the panel with the rail and stile being butt jointed together in a spaced relationship by means of the body 38. A generally C-shaped
100 rocker arm 40 is pivotally mounted in the aperture 39 on stub axles 41. The roller 36 is rotatably mounted on a block 42 via ball bearings (not shown) running in a ball race in the block 42. The block 42 is removably mounted on the free end of the rocker arm 40 via screw 43. The roller 36 can be mounted
105 on either side of rocker arm 40 as required.

The other end of rocker arm 40 has an outer cam surface, 44 which is engaged by a screw 45 threaded through a hole in one end of the body 38. As the
110 screw 45 is rotated to extend further into the aperture 39, it engages the cam surface 44 and causes the rocker arm 40 to rotate and thereby move roller 36 toward the sliding panels 27, 28 thereby effectively raising the sliding panels 27, 28 relative to
115 the head frame 17.

The corners of sliding panels 27 and 28 are butt jointed. The body 38 of the roller carriage 37 provides a block to support the butt area and space the respective top rail and stile to prevent the
120 tendency of splaying of these components as they are secured together.

Waisted portion 38a of the body 38 engages in the rail 33 adjacent groove 35, with downward flanges 46 on the waisted portion 38a engaging the end of the cross-piece 34 of the rail 33. A screw 47 passes
125 through a hole 48 in the body 38 and engages in the groove 35. The upper edges of the rail 33 engage the stepped portion joining the body 38 and its waisted portion 38a.

130 The stile 31 engages in a socket 49 in the

underside of the body and is engaged at its sides by body flanges 50. The inner edges of the stile 31 are aligned with the forward edges of the downward flanges 46 on the body 38, and thereby engages the end of the rail 33.

A screw 51 passes through a hole in the rear of the body, through the stile 31 and engages in groove 35 of the rail 33. When the screw 51 is tightened, relative movement of the stile 31 and rail 33 is

prevented by the downward flanges 46.

Figure 4 shows a guide corner support 52. One of these supports 52 is fitted to the bottom corner of fixed panel 26 and sliding centre panel 27 adjacent panels 27 and 28 respectively, while both lower corners of sliding panel 28 are fitted with the guide support 52.

The guide support 52 has a pair of side walls 53 joined by an end wall 54 to form a cavity into which block 55 extends. The cavity is dimensioned to allow the stile 31 to fit snugly therein.

Apertured saddle 56 is provided intermediate of the block 55 and has a hole 56a therethrough. In use, the forward face of the block 56 engages the cross-piece 34 of lintel 33 in the same manner as the downward flanges 46 on roller carriage 37. Ribs 57 are provided adjacent the saddle 56 at the free end of the block 55. The ribs 57 are dimensioned to fit between the side walls and the groove 35 of the lintel 33.

A tapered slot 58 is provided in the underside of the block between legs 59 and terminates in face 60.

A tongue 61 is provided adjacent one of the side faces 53 and is connected thereto by a horizontal piece 62.

In use, a screw 63 passes through a hole (not shown) in end wall 54, the stile 31, the hole 56a in block 56 and into the groove 35 in lintel 33.

Stop corner support 64 (FIG. 5) has many common features with guide corner support 52 and like numerals have been used to indicate these. The stop corner support 64 has only one side wall 53 and does not include the tongue 61 or the horizontal piece 62.

Stop corner supports 64 are provided on both upper corners of fixed panel 26, the lower corner of fixed panel 26 spaced from sliding panel 27 and on sliding panel 27 adjacent fixed panel 26.

The outer sliding panel 28 is provided with a handle 65 to enable sliding panels 27, 28 to be moved along the head frame 17.

The body 66 of the handle is substantially U-shaped in cross-section and is engaged in a stile 31. The body 66 is of the same thickness as the sealing strip 30 and engages the glass 29 (no sealing strip 30 being provided over the length of the body 66). The handle 65 has an outer grip 67 and an inner grip 68.

The shower screen is assembled as shown in Figures 1 and 2, using the roller carriage 37 (Figure 3), guide corner supports 52 (Figure 4) and stop corner supports 64 (Figure 5) as described.

The rollers 36 of the sliding outer panel 28 engage in channel track 23, having anti-jumpout track 17a overlying the roller. Similarly, rollers 36 of the sliding centre panel 27 engage in channel track 24 and are retained therein by anti-jumpout track 17b.

The tongues 61 of the guide corner supports 52 of

the sliding outer panel 28 are engaged in the inverted channel section 21 of the sill frame and can move freely therealong.

The tongue 61 of the guide corner support 52 on sliding centre panel 27 is engaged in the lower slot formed by the lower rail 33 of sliding outer panel 28 and is freely movable therealong. Similarly the tongue 61 of the guide corner support 52 on fixed inner panel 26 is engaged in the lower slot of lower rail 33 of sliding centre panel 27.

At the limit of the relative longitudinal movement of the sliding panels 27, 28, the tongue 61 on sliding centre panel 27 engages in slot 58 of one of the guide corner supports 52 on sliding outer panel 28 and strikes face 60. Further relative longitudinal movement of the panels 27, 28 is prevented. As the slots 58 are dimensioned to provide minimal clearance for the tongue 61, virtually no lateral movement between the panels 27, 28 is possible.

Similarly, at the limit of the relative longitudinal movement of the fixed inner panel 26 and sliding centre panel 27, the tongue 61 on the guide corner support 52 of fixed inner panel 26 is engaged in slot 58 against face 60 of either the guide corner support 52 or stop corner support of sliding centre panel 27.

Therefore, at the limit positions in the travel of the sliding panels 27, 28, their respective tongues 61 are engaged in the slots 58 to prevent any further longitudinal travel or any relative lateral movement.

To adjust the relative height of the sliding panels 27, 28 to head frame 17, the screws 45 in the roller carriages are rotated to vary their extension into the aperture 39 in the roller carriage 37. As previously described, as the screws 45 extend a greater distance into the aperture, their engagement with cam surface 44 causes the rocker arm 40 to rotate and roller 36 to move downwards towards the sliding panels 27, 28, thereby raising the panels 27, 28 relative to the head frame 17. As the screws 45 are readily accessible to the workmen, he can adjust the height of the rollers 36 on the sliding panels 27, 28 while the panels are installed in the shower screen.

Various changes and modifications may be made to the preferred embodiment herein described without departing from the scope of the present invention hereinafter defined in the appended claims. As recited above, this invention may be applied to multi-panel sliding doors or windows, partitions or the like where one of the panels may be fixed.

CLAIMS

1. A roller carriage for a multi-panel sliding door or the like including a substantially L-shaped body, a rocker arm pivotally mounted on the body, the rocker arm being generally C-shaped to provide two arms, one on each side of the pivotal mounting, a cam surface on one arm of the rocker arm, a roller rotatably mounted on the other arm of the rocker arm and adjustment means on the body engaging the cam surface to vary the distance of the roller from the body, the L-shaped body having two legs one adapted to engage and support a top rail and the other adapted to engage and support a stile of a panel butt-jointed together in a spaced relationship.



underside of the body and is engaged at its sides by body flanges 50. The inner edges of the stile 31 are aligned with the forward edges of the downward flanges 46 on the body 38, and thereby engages the end of the rail 33.

A screw 51 passes through a hole in the rear of the body, through the stile 31 and engages in groove 35 of the rail 33. When the screw 51 is tightened, relative movement of the stile 31 and rail 33 is prevented by the downward flanges 46.

Figure 4 shows a guide corner support 52. One of these supports 52 is fitted to the bottom corner of fixed panel 26 and sliding centre panel 27 adjacent panels 27 and 28 respectively, while both lower corners of sliding panel 28 are fitted with the guide support 52.

The guide support 52 has a pair of side walls 53 joined by an end wall 54 to form a cavity into which block 55 extends. The cavity is dimensioned to allow the stile 31 to fit snugly therein.

Apertured saddle 56 is provided intermediate of the block 55 and has a hole 56a therethrough. In use, the forward face of the block 56 engages the cross-piece 34 of lintel 33 in the same manner as the downward flanges 46 on roller carriage 37. Ribs 57 are provided adjacent the saddle 56 at the free end of the block 55. The ribs 57 are dimensioned to fit between the side walls and the groove 35 of the lintel 33.

A tapered slot 58 is provided in the underside of the block between legs 59 and terminates in face 60.

A tongue 61 is provided adjacent one of the side faces 53 and is connected thereto by a horizontal piece 62.

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Stop corner support 64 (FIG. 5) has many common features with guide corner support 52 and like numerals have been used to indicate these. The stop corner support 64 has only one side wall 53 and does not include the tongue 61 or the horizontal piece 62.

Stop corner supports 64 are provided on both upper corners of fixed panel 26, the lower corner of fixed panel 26 spaced from sliding panel 27 and on sliding panel 27 adjacent fixed panel 26.

The outer sliding panel 28 is provided with a handle 65 to enable sliding panels 27, 28 to be moved along the head frame 17.

The body 66 of the handle is substantially U-shaped in cross-section and is engaged in a stile 31. The body 66 is of the same thickness as the sealing strip 30 and engages the glass 29 (no sealing strip 30 being provided over the length of the body 66). The handle 65 has an outer grip 67 and an inner grip 68.

The shower screen is assembled as shown in Figures 1 and 2, using the roller carriage 37 (Figure 3), guide corner supports 52 (Figure 4) and stop corner supports 64 (Figure 5) as described.

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The tongue 61 of the guide corner support 52 on sliding centre panel 27 is engaged in the lower slot formed by the lower rail 33 of sliding outer panel 28 and is freely movable therealong. Similarly the tongue 61 of the guide corner support 52 on fixed inner panel 26 is engaged in the lower slot of lower rail 33 of sliding centre panel 27.

At the limit of the relative longitudinal movement of the sliding panels 27, 28, the tongue 61 on sliding centre panel 27 engages in slot 58 of one of the guide corner supports 52 on sliding outer panel 28 and strikes face 60. Further relative longitudinal movement of the panels 27, 28 is prevented. As the slots 58 are dimensioned to provide minimal clearance for the tongue 61, virtually no lateral movement between the panels 27, 28 is possible.

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Therefore, at the limit positions in the travel of the sliding panels 27, 28, their respective tongues 61 are engaged in the slots 58 to prevent any further longitudinal travel or any relative lateral movement.

To adjust the relative height of the sliding panels 27, 28 to head frame 17, the screws 45 in the roller carriages are rotated to vary their extension into the aperture 39 in the roller carriage 37. As previously described, as the screws 45 extend a greater distance into the aperture, their engagement with cam surface 44 causes the rocker arm 40 to rotate and roller 36 to move downwards towards the sliding panels 27, 28, thereby raising the panels 27, 28 relative to the head frame 17. As the screws 45 are readily accessible to the workmen, he can adjust the height of the rollers 36 on the sliding panels 27, 28 while the panels are installed in the shower screen.

Various changes and modifications may be made to the preferred embodiment herein described without departing from the scope of the present invention hereinafter defined in the appended claims. As recited above, this invention may be applied to multi-panel sliding doors or windows, partitions or the like where one of the panels may be fixed.

CLAIMS

1. A roller carriage for a multi-panel sliding door or the like including a substantially L-shaped body, a rocker arm pivotally mounted on the body, the rocker arm being generally C-shaped to provide two arms, one on each side of the pivotal mounting, a cam surface on one arm of the rocker arm, a roller rotatably mounted on the other arm of the rocker arm and adjustment means on the body engaging the cam surface to vary the distance of the roller from the body, the L-shaped body having two legs one adapted to engage and support a top rail and the other adapted to engage and support a stile of a panel butt-jointed together in a spaced relationship.



2. A roller carriage as claimed in claim 1, wherein the rocker arm is pivotally mounted in an aperture in the body on a pair of stub-axes and the adjustment means comprises a screw screw-threadably mounted in the body and extending into the aperture to engage the cam surface.
3. A roller carriage as claimed in claim 1 or 2, wherein the one leg of the body has a waisted portion for engagement in a groove in the top rail when assembled thereto, shoulders defining the waisted portion being adapted to be engaged by edges of the rail when assembled thereto.
4. A roller carriage as claimed in any one of claims 1 to 3, wherein the other leg of the body comprises body flanges defining a socket for the receipt of a stile.
5. A panel comprising a stile and a lintel joined together by assembly with a carriage as claimed in any preceding claim.
6. A multi-panel sliding door assembly including a frame, a roller track on said frame, a first panel fixed in said frame and at least one sliding panel slidably mounted in the frame, the sliding panel comprising a top rail and a pair of stiles joined together by assembly with a pair of roller carriages, each roller carriage being as claimed in any one of claims 1 to 4 with the rollers thereof engaging said roller track.
7. A roller carriage for multi-panel sliding doors or the like constructed and arranged substantially as hereinbefore described with reference to and as illustrated in Figure 3 of the accompanying drawings.
8. A multi-panel sliding door assembly constructed and arranged substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.