

PATENT SPECIFICATION

(11)

1 555 871

1 555 871

- (21) Application No. 15108/77 (22) Filed 12 Apr 1977
(31) Convention Application No. 51/045681U (32) Filed 12 Apr 1976 in
(33) Japan (JP)
(44) Complete Specification Published 14 Nov 1979
(51) INT CL² E06B 3/46
E05D 13/02
(52) Index At Acceptance
E1J EB



(54) ROLLER ASSEMBLY AND SLIDING CLOSURE PANEL ASSEMBLY

(71) We, YOSHIDA KOGYO K.K., a corporation duly organized under the laws of Japan and existing at No. 1, Kanda Izumi-cho, Chiyoda-ku, TOKYO, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:-

This invention relates to a sliding closure panel assembly having a plurality of roller assemblies attached to the horizontal bottom rail member thereof to permit the sliding movement of the closure panel assembly along a horizontal track.

Most of the conventional roller assemblies of this general type are designed either for use with a horizontal track of an upwardly opening channel-shaped cross-section having a horizontal base with which the associated roller wheels are adapted to be in rolling engagement, or for use with a horizontal track having a longitudinal vertical flange on its upper surface on which the associated rollers are adapted to rollably ride. One form of roller assembly which could be adapted for use with both tracks is also known in which a roller frame rotatably carries a roller wheel in such a manner that the periphery of the roller wheel extends outwardly from the frame for rolling engagement with either of the horizontal base or the vertical flange. This roller assembly has been found not entirely satisfactory, however, in that, when used with the track having the longitudinal vertical flange, the roller wheel is liable to lateral movement out of rolling engagement with the vertical flange during the sliding movement of the closure panel assembly along the track. Another difficulty of the conventional roller assemblies is that they have relatively many component parts and hence are somewhat complicated in construction.

The present invention seeks to provide a

closure panel assembly having roller assemblies which permit the closure panel assembly to be adaptable for use with both an upwardly opening channeled track and a track having a vertical longitudinal flange or rail in a manner to positively guide the sliding movement of the closure panel assembly.

The invention further seeks to provide a roller assembly for use with closure panel assemblies which has a minimum number of component parts and which is sturdy in construction and inexpensive to manufacture, and is capable of easy attachment to the closure panel assemblies.

According to the invention, there is provided a sliding closure panel assembly comprising an edge member in the form of a channel opening outwardly of the assembly and having a plurality of cut outs spaced longitudinally along the edge member and extending transversely thereof, a roller assembly receivable into each of the cut outs and comprising a frame having two opposite sides between which a roller is rotatably mounted, the sides extending to a first edge beyond the roller periphery in a first direction and to a second edge short of the roller periphery in the opposite direction and mounting means on opposite ends of the frame and insertable into the channel of the edge member on opposite sides of the cut outs for retaining the roller arrangement in the associated cut out.

Preferably, a pair of end walls interconnect said side walls at their respective opposite ends, each of said end walls having in one edge a notch of U-shaped contour which is defined by a pair of lateral edges and an end edge lying therebetween, and the mounting means comprise retainers formed integrally with and extending from the end walls in opposite directions, each of the retainers being disposed intermediate the notch and the other edge of said end

50

55

60

65

70

75

80

85

90

wall. The retainers desirably frictionally engage the limbs of the channel.

The invention will now be described in greater detail, by way of example, with reference to the drawings, in which:-

Figure 1 is a perspective view of a portion of a sliding closure panel assembly provided in accordance with the present intention, showing a roller assembly just before it is mounted on the closure panel assembly;

Figure 2 is a perspective view of the roller assembly with a part broken away;

Figure 3 is a side elevation view of the roller assembly;

Figure 4 is an end view of the roller assembly;

Figure 5 is a vertical transverse cross-sectional view of the roller assembly shown in engagement with a channeled track; and

Figure 6 is a view similar to Figure 4 but showing the roller assembly in engagement with a track having a vertical flange.

Figure 1 shows part of a sliding closure panel assembly adapted to be mounted within an outer frame (not shown), installed in an opening in a building wall, for horizontal movement between an opened and a closed position, the sliding closure panel assembly here comprising a screen sash 10. The screen sash 10 comprises a rectangular frame 11 having a horizontal bottom rail member 12, a panel 13 of screening mounted within the frame 11, and a plurality of roller assemblies 14 mounted on the bottom rail member 12 and spaced along the length thereof, one of the roller assemblies 14 being shown detached from the bottom rail member 12.

The bottom rail member 12 includes a body of a generally downwardly opening channel-shaped cross-section which is made of a synthetic resin and has a pair of parallel spaced limbs 15, 15 connected by a base 16 of a C-shaped cross-section, the C being connected to the limbs 15, 15 at either side of its mouth. The bottom rail member 12 has an upwardly opening channel portion 17 formed integrally with and extending along the base 16. The channel portion 17 receives and retains a lower marginal portion of the screen panel 13. A plurality of pairs of downwardly opening opposed openings 18, 18 of an inverted U-shaped contour are formed through the arms 15, 15 respectively, in longitudinally spaced relation to provide a plurality of open areas 19 extending transversely through the bottom rail member 12 and spaced along the length thereof.

Each of the roller assemblies 14 has a hollow frame 20 of a rectangular horizontal cross-section having a pair of parallel spaced apart side walls 21, 21 of a rectangular shape and a pair of end walls 22, 22 interconnecting the side walls 21, 21 at their respective opposite ends. Each of the end walls 22, 22

has a notch 23 of U-shaped contour in one edge which is defined by a pair of parallel lateral edges 23a, 23a and an end edge 23b lying therebetween. The width of the roller frame 20 between the side walls 21, 21 is slightly greater than that of the bottom rail member 12 between the opposed arms 15, 15. The length of each of the side walls 21, 21 is substantially equal to the length of the opening 18.

Formed integrally with and extending from the end walls 22, 22 in opposite directions are a pair of retainers 24, 24 each comprising a pair of laterally spaced apart rectangular sections 24a, 24a each having its distal end portion thickened to provide an engaging portion 24b. One edge of each of the rectangular sections 24a, 24a lies flush with the end edge 23b of the notch 23 while the other edge is disposed intermediate the end edge 23b and one edge of the end wall 22 remote from the notch 23.

Each of the roller assemblies 14 has a roller wheel 25 rotatably mounted on a pin member 26 and disposed between the side walls 21, 21, the pin member 26 here comprising a rivet journaled in the side walls 21, 21 at opposite ends, and the roller wheel 25 having a peripheral groove 27. As best shown in Figures 2, 3 and 4, the periphery of the roller wheel 25 is disposed intermediate of a dimension of the roller frame 20 between the end edge 23b of the notch 23 and one edge 28, 28 of the side walls 21, 21. The periphery of the roller wheel 25 also extends outwardly beyond the other edges 29, 29 of the side walls 21, 21. The bottom of the peripheral groove 27 is also disposed outwardly of the plane of the end edge (23b).

When the screen sash 10 is to be mounted within an outer frame 30 including a horizontal sill 31 having an upwardly opening channel-shaped track 32 (Figure 5), each of the roller assemblies 14 is mounted in a respective one of the longitudinally spaced open areas 19 from below in such a manner that each of the side walls 21, 21 is snugly fitted in the respective opening 18 with the end walls 22, 22 in engagement with the opposite vertical edges 18a, 18a of the opening 18 at one of their marginal portions 22a, 22a and with the edge 28 of each of the side walls 21, 21 in alignment with the horizontal edge of the opening 18 defined by a respective one of the distal edges of the channel-shaped base 16. For attachment of each of the roller assemblies 14 to the bottom rail member 12, each pair of opposed rectangular sections 24a, 24a are first urged toward each other with a finger pressure and then are forced in between the opposed arms 15, 15 with their thickened engaging portion 24b, 24b in frictional engagement therewith. Finally the screen sash

70

75

80

85

90

95

100

105

110

115

120

125

130

one
rallel
23b
oller
21 is
70
rail
arms
walls
th of
75
ding
lirec-
each
apart
ing its
le an
ch of
flush
while
e the
wall
as a
a pin
side
com-
walls
wheel
best
ry of
diate
20
h 23
1,21.
also
dges
m of
osed
edge
105
nted
hori-
ning
h of
in a
aced
nner
ugly
the
115
pen-
ions
f the
d by
the
it of
the
of
125
ager
the
ned
en-
sash
130

10 is mounted within the outer frame 30 with the respective roller wheels 25 in rolling engagement with a horizontal base 32a of the channel-shaped track 32. Each of the roller frames 20 is made slightly less in width than the track 32 so that the roller frames 20 serve to minimize the lateral movement of the screen sash relatively to the plane of the outer frame 30, thereby facilitating the sliding movement of the sash 10 and silencing rattle noises caused by the sash 10 during the sliding movement thereof.

When the screen sash 10 is to be installed within an outer frame 33 including a horizontal sill 34 having a vertical longitudinal flange or rail 35 on an upper surface thereof (Figure 6), each of the roller assemblies 14 is first mounted in the respective open area 19 in the same manner as described above for the outer frame 30 except that the edge 29 of each of the side walls 21,21 is in alignment with the horizontal edge of the opening 18. Then, the screen sash 10 is mounted within the outer frame 33 with the roller wheels 25 riding on the vertical flange 35. The pair of notches 23,23 in the opposite end walls 22,22 loosely receive the vertical flange 35 to restrain the lateral movement of the roller wheel 25 out of rolling engagement with the flange 35, thereby positively guiding the sliding movement of the screen sash.

WHAT WE CLAIM IS:

1. A sliding closure panel assembly comprising an edge member in the form of a channel opening outwardly of the assembly and having a plurality of cut outs spaced longitudinally along the edge member and extending transversely thereof, a roller assembly receivable into each of the cut outs and comprising a frame having two opposite sides between which a roller is rotatably mounted, the sides extending to a first edge beyond the roller periphery in a first direction and to a second edge short of the roller periphery in the opposite direction and mounting means on opposite ends of the frame and insertable into the channel of the edge member on opposite sides of the cut outs for retaining the roller arrangement in the associated cut out.

2. An assembly according to Claim 1, wherein a pair of end walls interconnect the side walls at their respective opposite ends, each of said end walls having in one edge a notch of U-shaped contour which is defined by a pair of lateral edges and an end edge lying therebetween, and the mounting means comprise retainers formed integrally with and extending from the end walls in opposite direction, each of the retainers

being disposed intermediate the notch and the other edge of said end wall.

3. An assembly according to claim 2 wherein the retainers frictionally engage the limbs of the channel.

4. An assembly according to claim 2 or 3, wherein each cut out comprises a pair of opposed openings of a generally inverted U-shaped contour, and wherein the side walls of the roller frame are parallel and each has a rectangular shape.

5. An assembly according to claim 2, 3 or 4, wherein each of the retainers comprises a pair of opposed sections spaced in the transverse direction of the edge member.

6. An assembly according to any preceding claim, in which said roller frame is made of a synthetic resin.

7. An assembly according to any preceding claim for use with a horizontal track having a flat upper surface, wherein each of the roller assemblies is mounted in its respective cut out with the second edge of the side walls facing the horizontal track, for permitting the roller to rollingly engage the flat upper surface.

8. An assembly according to claim 7, wherein the width of the frame between the side walls is slightly greater than the width of the edge member between its channel limbs so that the walls project slightly laterally from the channel limbs.

9. A sliding closure panel assembly according to claim 2 or any one of claims 3 to 6 when appendent directly or indirectly thereto, for use with a horizontal track having a longitudinal vertical flange on its upper surface extending therealong, wherein the width of the notch between said lateral edges thereof is greater than that of the vertical flange but is less than that of the edge member between its channel limbs and wherein each of the roller assemblies is mounted in its respective cut out with the first edges of the side walls facing the horizontal track, for permitting said roller wheel to rollingly engage the vertical flange with said pair of notches loosely receiving the vertical flange therein.

10. A sliding closure panel assembly substantially as herein described with reference to the drawings.

11. A roller assembly substantially as described herein with reference to and as illustrated in the drawings.

For the Applicants
J. F. WILLIAMS & CO.
Chartered Patent Agents
113 Kingsway
London W.C.2.



10 is mounted within the outer frame 30 with the respective roller wheels 25 in rolling engagement with a horizontal base 32a of the channel-shaped track 32. Each of the roller frames 20 is made slightly less in width than the track 32 so that the roller frames 20 serve to minimize the lateral movement of the screen sash relatively to the plane of the outer frame 30, thereby facilitating the sliding movement of the sash 10 and silencing rattle noises caused by the sash 10 during the sliding movement thereof.

When the screen sash 10 is to be installed within an outer frame 33 including a horizontal sill 34 having a vertical longitudinal flange or rail 35 on an upper surface thereof (Figure 6), each of the roller assemblies 14 is first mounted in the respective open area 19 in the same manner as described above for the outer frame 30 except that the edge 29 of each of the side walls 21, 21 is in alignment with the horizontal edge of the opening 18. Then, the screen sash 10 is mounted within the outer frame 33 with the roller wheels 25 riding on the vertical flange 35. The pair of notches 23, 23 in the opposite end walls 22, 22 loosely receive the vertical flange 35 to restrain the lateral movement of the roller wheel 25 out of rolling engagement with the flange 35, thereby positively guiding the sliding movement of the screen sash.

WHAT WE CLAIM IS:

1. A sliding closure panel assembly comprising an edge member in the form of a channel opening outwardly of the assembly and having a plurality of cut outs spaced longitudinally along the edge member and extending transversely thereof, a roller assembly receivable into each of the cut outs and comprising a frame having two opposite sides between which a roller is rotatably mounted, the sides extending to a first edge beyond the roller periphery in a first direction and to a second edge short of the roller periphery in the opposite direction and mounting means on opposite ends of the frame and insertable into the channel of the edge member on opposite sides of the cut outs for retaining the roller arrangement in the associated cut out.

2. An assembly according to Claim 1, wherein a pair of end walls interconnect the side walls at their respective opposite ends, each of said end walls having in one edge a notch of U-shaped contour which is defined by a pair of lateral edges and an end edge lying therebetween, and the mounting means comprise retainers formed integrally with and extending from the end walls in opposite direction, each of the retainers

being disposed intermediate the notch and the other edge of said end wall.

3. An assembly according to claim 2 wherein the retainers frictionally engage the limbs of the channel.

4. An assembly according to claim 2 or 3, wherein each cut out comprises a pair of opposed openings of a generally inverted U-shaped contour, and wherein the side walls of the roller frame are parallel and each has a rectangular shape.

5. An assembly according to claim 2, 3 or 4, wherein each of the retainers comprises a pair of opposed sections spaced in the transverse direction of the edge member.

6. An assembly according to any preceding claim, in which said roller frame is made of a synthetic resin.

7. An assembly according to any preceding claim for use with a horizontal track having a flat upper surface, wherein each of the roller assemblies is mounted in its respective cut out with the second edge of the side walls facing the horizontal track, for permitting the roller to rollingly engage the flat upper surface.

8. An assembly according to claim 7, wherein the width of the frame between the side walls is slightly greater than the width of the edge member between its channel limbs so that the walls project slightly laterally from the channel limbs.

9. A sliding closure panel assembly according to claim 2 or any one of claims 3 to 6 when appendent directly or indirectly thereto, for use with a horizontal track having a longitudinal vertical flange on its upper surface extending therealong, wherein the width of the notch between said lateral edges thereof is greater than that of the vertical flange but is less than that of the edge member between its channel limbs and wherein each of the roller assemblies is mounted in its respective cut out with the first edges of the side walls facing the horizontal track, for permitting said roller wheel to rollingly engage the vertical flange with said pair of notches loosely receiving the vertical flange therein.

10. A sliding closure panel assembly substantially as herein described with reference to the drawings.

11. A roller assembly substantially as described herein with reference to and as illustrated in the drawings.

For the Applicants
J. F. WILLIAMS & CO.
Chartered Patent Agents
113 Kingsway
London W.C.2.