Nov. 24, 1953 J. W. GREIG 2,659,939

SLIDING DOOR ASSEMBLY

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FIG. 2

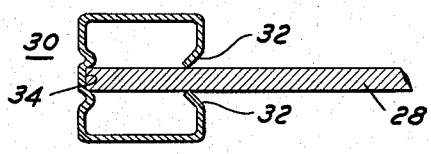
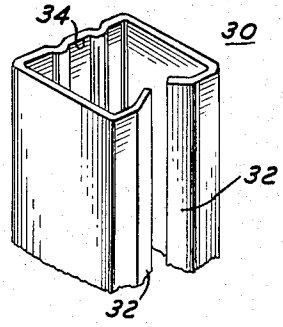


FIG. 3



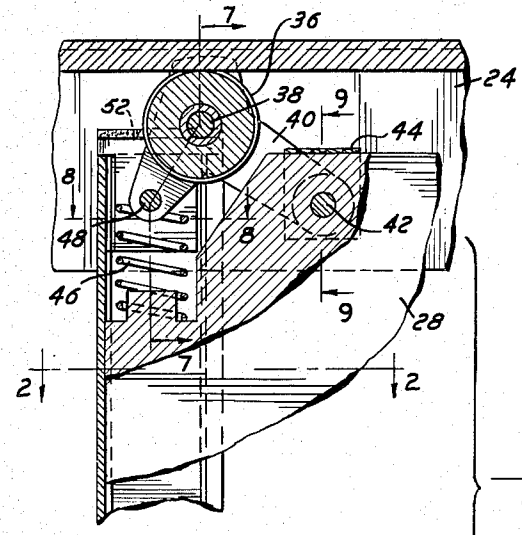


FIG. 5

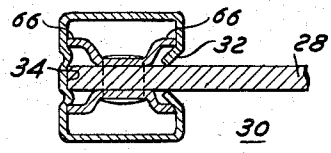


FIG. 1

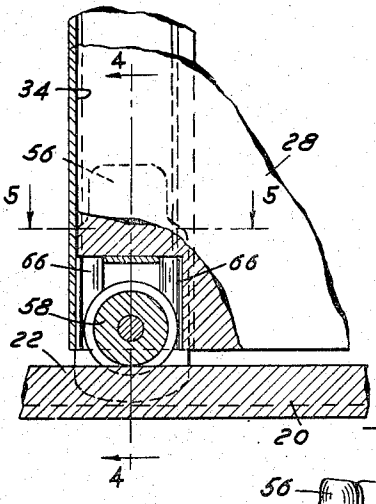


FIG. 4

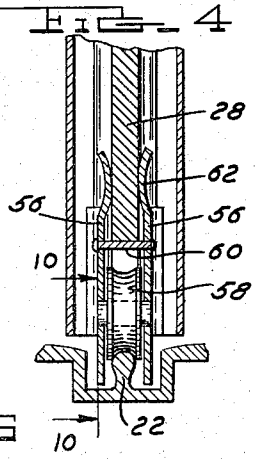
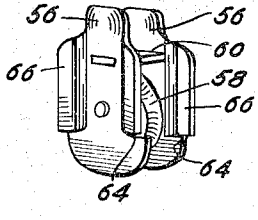


FIG. 6



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FIG. 7

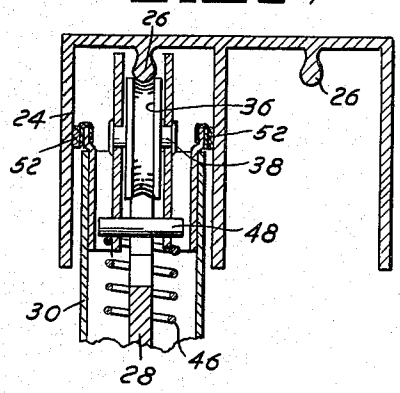


FIG. 8

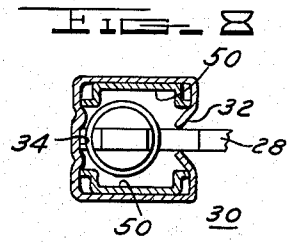


FIG. 10

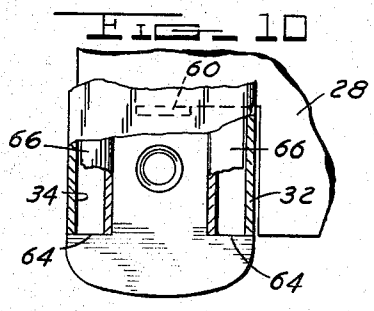


FIG. 9

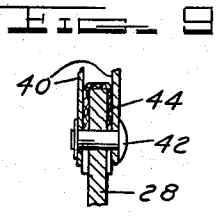


FIG. 12

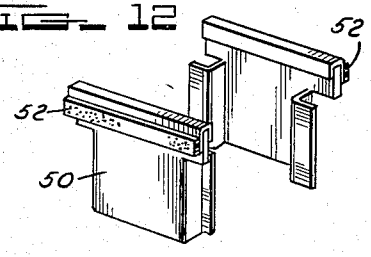
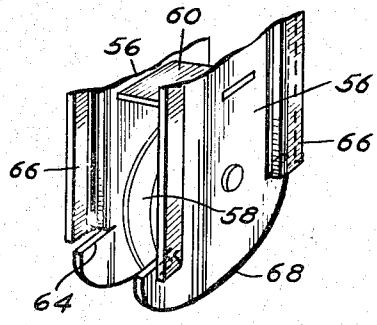


FIG. 11



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UNITED STATES PATENT OFFICE

2,659,939

SLIDING DOOR ASSEMBLY

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Application May 18, 1950, Serial No. 162,701

21 Claims. (Cl. 20—19)

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This invention relates to improvements in sliding doors, closures, panels, or the like.

The invention pertains to sliding panels of the general character illustrated in applications assigned to the assignee of this application U. S. Serial Nos. 126,983 and 138,621, filed November 14, 1949, and January 14, 1950, respectively.

Sliding panels of this general character comprise a flat panel sheet formed of any suitable material provided with a marginal tube extending along and embracing one or more margins of the sheet. The panel assembly is equipped with suitable rollers or other means whereby it is supported for easy slidable movement. Any suitable sheet material may be employed to make up the broad expanse of the panel. Composition fiberboard, such as commonly sold under the trade name "Masonite" has been successfully used. In one embodiment of the invention in a sliding door such a sheet of composition material has been provided along its two upright margins with reinforcing tubes extending along such margins and secured thereto.

This particular invention relates to an improved tube assembly secured to the margin of the panel sheet and including an improved type of tube and an improved type of slidable support associated with the tube and with the panel to support the panel assembly for slidable movement.

One object of this invention is the provision of a marginal tube for a panel sheet in the form of a split tube having resilient wall portions adapted to grippingly engage opposite sides of the panel sheet and which tube is so shaped and associated with the panel sheet as to be held against tilting or displacement thereon.

A meritorious feature resides in the provision of such a tube with an internal channel portion disposed diametrically in opposition to its split and extending parallel to the split and within which channel the edge of the panel sheet is seated.

The edges of the tube at the split are bent inwardly and grippingly engage the opposite sides of the panel sheet and hold it to its seat within the interior channel of the tube. As specifically shown, the tube is substantially rectangular in cross section and the tube wall is bent to define the channel which extends lengthwise of the tube in opposition to the split therein.

An advantage of the structure of this application is that the slidable supporting means with which the bottom of the panel assembly is provided is in the form of a roller assembly coupled

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directly with one end of the tube. These tubes are commonly formed of metal and the portions of the roller assemblies engaged therewith are likewise commonly formed of metal and there is metal to metal contact between the roller assemblies and the tubes. The construction is such that the roller assembly may be readily secured to an end of the tube and the weight of the tube taken thereon.

A meritorious feature resides in the provision of such a roller assembly which is so constructed and so associated with the tube and with the panel sheet as to support and take the weight of the tube and the panel sheet itself.

An advantage of this combined tube and roller assembly is that the roller assembly includes a pair of side frame plates between which the roller itself is rotatably supported and these side frame plates are designed to be telescopically received within one end of the tube to be frictionally securely held therein. These frame plates are so shaped that they engage opposite side walls of the tube on opposite sides of the split therein and on opposite sides of the interior channel thereof. They also engage the panel sheet within the tube and serve to position the roller assembly with respect to the panel. The roller assembly includes a bridge portion extending between the plates which bridge portion is adapted to engage an edge of the panel sheet to take the weight thereof. The side plates of the roller assembly frictionally engage with the tube so as to hold the roller assembly therein. Such side plates overlap the inwardly bent edges of the tube at the split holding them against separation.

The tube is so shaped in cross section that the side plates of the roller assembly are not only held frictionally therein but bearing plates may be frictionally inserted within an end of the tube to project outwardly therebeyond which bearing plates are provided with cushion wear portions adapted to slidably engage opposite side walls of a channel within which the panel is mounted to facilitate its slidable movement.

Other advantages and desirable features will more fully appear from the following specification, claims and accompanying drawings, wherein

Fig. 1 is a vertical section, partly broken away, through a panel assembly embodying the invention mounted between upper and lower guides for slidable travel;

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a perspective of a fragment of the improved type of tube herein shown;

Fig. 4 is a fragmentary vertical cross section taken on the line 4—4 of Fig. 1;

Fig. 5 is a fragmentary horizontal section taken on the line 5—5 of Fig. 1;

Fig. 6 is a perspective of one of the roller assemblies herein shown;

Fig. 7 is a fragmentary vertical sectional view taken on the line 7—7 of Fig. 1;

Fig. 8 is a horizontal fragmentary section taken on the line 8—8 of Fig. 1;

Fig. 9 is a vertical fragmentary section taken on the line 9—9 of Fig. 1;

Fig. 10 is a fragmentary vertical section taken on the line 10—10 of Fig. 4;

Fig. 11 is a perspective of a fragment of the roller assembly shown also in Fig. 6;

Fig. 12 is a perspective of a pair of wear plates such as shown in Fig. 7.

In the two applications hereinabove referred to there are shown slidable door assemblies mounted between upper and lower guideways for slidable travel. This particular invention relates not to the guideways but to the door assembly and particularly to improvements in the tubular asembly associated with the panel.

In Fig. 1 the sill portion of the door frame which sill extends along the floor is indicated by the numeral 20 and is provided with a rail 22 upon which the roller of the lower roller assembly is designed to rest and travel. The header of the door frame is indicated generally in Fig. 1 by the numeral 24. Such header may be provided with depending rails 26 (Fig. 7) over which the upper guide rollers mounted on the door assembly are adapted to travel.

The panel sheet itself is indicated by the numeral 28. Such panel sheet may be a sheet of composition fiberboard as, for example, "Masonite." Any suitable flat, strong, relatively rigid material may be employed. A split tube indicated generally by the numeral 30 is adapted to be secured to one margin of this panel sheet to extend along such margin. The particular split tube shown is substantially rectangular in cross section. The opposite edges 32 of the tube at the split are bent inwardly, as shown in Figs. 2, 3 and 5. The tube is formed preferably of metal or some material which provides resilient side wall portions so that the inturned edges 32 are held grippingly against opposite sides of the panel sheet.

The wall of the tube is shaped to define a channel 34 which is disposed diametrically opposite to the split and extends parallel thereto. The edge of the panel sheet is adapted to seat within this interior channel. The side walls of the channel hold the sheet seated and position the tube upon the panel against tilting thereof. The tube is therefore held upon the margin of the sheet in a secure manner and the inturned edges of the tube held the same upon the panel sheet in such a manner that seating engagement of the edge of the panel within the channel is at all times maintained.

The panel is equipped with slidable supports. At an upper corner there is a roller assembly which includes a roller 36 mounted upon a pivot 38 between a pair of angular side plates 40. A roller assembly of this general character was shown and described in my application Serial No. 126,983, above referred to. The assembly itself is swingably pivoted upon a pivot pin 42 which extends through the panel sheet. The panel sheet is provided with a reinforcement 44 through which this pivot mounting 42 extends, as shown in Fig. 1. A spring 46 acts upon the roller assembly through a pin 48 to urge the roller against the overhead track.

The upper end of the tube is shown in Figs. 1 and 7 as provided with silent slide wear plates 50 which are illustrated in detail in Fig. 12. Two of these plates are provided. Each plate is channel shaped in cross section, as shown in Figs. 8 and 12. It has marginal portions 52 adapted to engage opposite side walls of the tube, as shown in Fig. 8, so as to hold the plate frictionally therein. Each plate has an outwardly offset upper portion carrying a cushion wear strip 54 which, as shown in Fig. 7, is adapted to slidably engage the opposite sides of the overhead channel within which the door assembly travels.

The lower end of the tube is equipped with a roller assembly which is telescopically received therein. This roller assembly frictionally engages the tube interiorly and maintains its position thereon. This roller assembly is shown particularly in Figs. 4, 6 and 11. It comprises a pair of side plates 56. Between these side plates is journaled a roller 58. A bridge member 60 extends between these side plates spaced from the roller. Each side plate is so shaped that the upper ends of the plates, as shown in Fig. 4 at 62, grippingly engage opposite sides of the panel sheet 28 to align the roller parallel with the panel. The bottom edge of this panel sheet is adapted to rest upon the bridge 60 of the roller assembly, as shown in Fig. 4. The weight of the panel sheet is therefore taken upon the roller assembly. The thrust of the roller, however, is not against the panel sheet itself so much as it is against the end of the tube.

It will be noted that the side plates 56 are provided with shoulders 64 and these shoulders engage the end of the tube as seen in the drawing. The side plates have marginal portions 66 which are bent outwardly out of the plane of the plates and away from the roller. These marginal portions 66 are adapted to overlap the side walls of the channel 34 and the inturned edges 32 of the tube, as shown particularly in Fig. 5.

The roller assembly is so formed that it constitutes a tight fitting frictional engagement within the end of the tube and the wings or marginal portions 66 hold the inturned edges 32 of the tube against separation. Through engaging over the inturned edges and the side walls of the channel the roller assembly is positioned within the tube with respect to the tube and with respect to the panel sheet itself and still without imposing a localized stress upon the sheet. The side plates extend downwardly beyond the roller providing what might be termed a runner portion 68 which serves to maintain the trackway on opposite sides of the rail 22 free from obstructing deposits. This same purpose is obtained by the upstanding portions of the rollers.

What I claim is:

1. In combination, a split tube having its edges at the split bent inwardly of the tube and having its wall diametrically opposed to the split shaped to provide an inwardly open channel extending parallel to the split, a flat panel having one marginal portion received within the tube with the edge of such portion seated within said inwardly open channel, the inwardly bent edges of the tube at the split grippingly engaging opposite sides

of the panel holding the edge thereof to its seat within said channel, said marginal portion of the panel having a thickness substantially less than the transverse inside dimension of the tube normal to the plane of the panel.

2. A marginal tube for a panel comprising a split resilient wall tube having a portion of its wall shaped to define a channel opening inwardly of the tube and extending lengthwise thereof substantially diametrically in opposition to the split, the width of said channel being less than the width of the side wall of the tube within which the channel is formed, the opposite edges of the tube at the split being bent inwardly of the tube toward the side walls of the channel and the walls of the tube terminating at the split being resilient.

3. In combination, a split resilient wall tube having its edges at the split bent inwardly of the tube and having its wall diametrically opposed to the split shaped to provide an inwardly open channel extending parallel to the split, a flat panel having one marginal portion received within the tube with the edge of such portion seated within said inwardly open channel, the inwardly bent edges of the tube at the split grippingly engaging opposite sides of the panel holding the edge thereof to its seat within said channel, and a roller assembly comprising a pair of opposed complementary side plates having a roller rotatably supported therebetween and provided with a bridge portion extending between the plates spaced above the roller, said roller assembly side plates telescoped within one end of the tube and over a marginal portion of the panel grippingly engaging the same with said bridge portion of the assembly bearing against an edge of the panel within the tube and adapted to serve as a support for the panel.

4. In combination, a split resilient wall tube having its edges at the split bent inwardly of the tube and having its wall diametrically opposed to the split shaped to provide an inwardly open channel extending parallel to the split, a flat panel having one marginal portion received within the tube with the edge of such portion seated within said inwardly open channel, the inwardly bent edges of the tube at the split grippingly engaging opposite sides of the panel holding the edge thereof to its seat within said channel, and a roller assembly comprising a roller rotatably supported between a pair of side frame plates, said side frame plates having shoulder portions telescoped within one end of the tube and with said shoulder portions bearing against the end of the tube, said frame plates having marginal portions bent out of the plane of the shoulder portions and engaging the wall of the tube on opposite sides of the split and on opposite sides of the channel.

5. In combination, a split resilient wall tube of substantially rectangular cross section having its edges at the split bent inwardly of the tube and having its wall diametrically opposed to the split shaped to provide an inwardly open channel extending parallel to the split, a flat panel having one marginal portion received within the tube with the edge of said portion seated within said inwardly open channel, the inwardly bent edges of the tube at the split grippingly engaging opposite sides of the panel holding the edge thereof to its seat within said channel, and a roller assembly comprising a pair of opposed complementary side frame plates having a roller rotatably supported therebetween, said plates having portions bent outwardly away from the roller, said roller assembly telescoped into an end of the tube with said portions frictionally engaging the wall of the tube on opposite sides of the split, said plates having shoulder parts offset said portions and abutting the end of the tube on opposite sides of the split when the assembly is telescoped into the tube.

6. In combination, a longitudinally split tube having its edges at the split bent inwardly of the tube and having its wall diametrically opposed to the split provided with inwardly projecting lengthwise extending parallel panel-engaging means spaced apart to engage opposite sides of a marginal portion of a panel received within the tube through the split, a flat panel having one marginal portion received within the tube through the split with the edge of said portion seated between said parallel spaced panel-engaging means, the inwardly bent edges of the tube at the split engaging opposite sides of the panel and the edge of the panel seated between said engaging means, and a roller assembly comprising a pair of opposed complementary side frame plates having a roller rotatably supported therebetween, said roller assembly telescoped into an end of the tube with the marginal portions of the plates engaged over the inwardly bent margins of the tube on opposite sides of the split and engaged over the parallel spaced panel engaging means holding the assembly within the tube.

7. In combination, a split resilient wall tube of substantially rectangular cross section having its edges at the split bent inwardly of the tube and having its wall diametrically opposed to the split provided with two rows of spaced parallel panel-engaging means substantially in line with the margins of the tube at the split, a flat panel having one marginal portion received within the tube with the edge of said portion seated between said two rows of means, the inwardly bent edges of the tube at the split grippingly engaging opposite sides of the panel, and a roller assembly comprising a pair of opposed complementary side frame plates having a roller rotatably supported between said plates and having opposed marginal portions offset outwardly, said roller assembly telescoped into an end of the tube with said outwardly offset portions of the plates engaged over the inwardly bent margins of the tube on opposite sides of the split and engaged over said two rows of means holding the assembly within the tube, said plates having parts adapted to abut the end of the tube adjacent to said means and adjacent to the inwardly bent edges of the tube at the split, a pair of complementary wear plates channel-shaped in cross section telescoped within the opposite end of the tube, said plates having offset marginal portions engaged over the inwardly bent margins of the tube on opposite sides of the split and engaged over said two rows of means, said plates having end portions overhanging the end of the tube and projecting therebeyond and provided with exterior wear portions.

8. In combination, a split resilient wall tube having its edges at the split bent inwardly of the tube, a flat panel having one marginal portion received within the tube with the tube extending along over said margin of the panel, the inwardly bent edges of the tube at the split grippingly engaging opposite sides of the panel, a roller assembly comprising a roller rotatably supported between a pair of side plates, said assembly telescoped into one end of the tube with the side

plates of the assembly having portions overlapping the two inwardly bent edges of the tube at the split to restrain spreading apart of said edges.

9. In combination, a split resilient wall tube having its edges at the split bent inwardly of the tube and having a portion of its wall shaped to define a channel extending lengthwise of the tube diametrically in opposition to the split, a flat panel having one marginal portion received within the tube with an edge of such portion seated within said channel, the inwardly bent edges of the tube at the split grippingly engaging opposite sides of the panel, a roller assembly comprising a roller rotatably supported between a pair of side plates, said assembly telescoped within an end of the tube with the side plates of the assembly overlapping and grippingly engaging opposed sides of the flat panel positioning the assembly with respect to the panel.

10. In combination, a split resilient wall tube having its edges at the split bent inwardly of the tube and having a portion of its wall shaped to define a channel extending lengthwise of the tube diametrically in opposition to the split, a flat panel having one marginal portion received within the tube with the tube extending along over such margin of the panel and with an edge of such portion seated within the channel, the inwardly bent edges of the tube at the split grippingly engaging opposite sides of the panel, a roller assembly comprising a roller rotatably supported between a pair of side plates having a bridge portion extending therebetween spaced from the roller, said assembly telescoped into the end of the tube with the side plates grippingly engaging opposite sides of the panel within the tube and with said bridge portion bearing against the edge of the panel.

11. A marginal tube for a panel, said tube being substantially rectangular in cross section and having one side wall provided with a split extending lengthwise of the tube substantially along the mid line of said wall, the opposite margins of the tube at the split being bent inwardly of the tube, the opposite side walls of the tube terminating at the split being resilient, that wall portion of the tube opposite to the split being provided with linearly extending substantially parallel spaced apart panel-engaging means projecting inwardly of the tube substantially on a line with the edges of the tube at the split and adapted to engage opposite sides of a panel received through said split and seated against the opposite side wall of the tube, said tube having an internal transverse dimension between opposed un-split side walls substantially greater than the width of the split.

12. A marginal tube for a panel comprising a split resilient wall tube having a portion of its wall substantially diametrically opposed to the split bent inwardly providing linearly extending substantially parallel spaced apart beads projecting inwardly of the tube and adapted to engage opposite sides of the marginal portion of a panel received within the tube through the split.

13. In combination, a tube substantially rectangular in cross section and having one side wall provided with a split extending lengthwise thereof substantially on the mid line of said wall, the opposite margins of the tube at the split being bent inwardly of the tube and the opposite side walls of the tube terminating in the inwardly bent margins being resilient, that side wall of the tube opposed to the split being bent inwardly providing two beads projecting inwardly of the tube in spaced parallel relation substantially on a line with the edges of the tube at the split, and a flat panel having one marginal portion received within the split with the edge of the panel seated against that side wall of the tube opposed to the split between said panel-engaging beads, said inwardly bent margins of the tube grippingly engaging opposite sides of the panel.

14. In combination, a split tube having its edges at the split bent inwardly of the tube and tensioned toward each other, said tube provided substantially diametrically opposed to the split with two parallel spaced apart rows of panel-engaging means, a flat panel having a marginal portion received through the split with its edge seated against the tube between said two rows of means, and a pair of complementary guide plate members telescoped within an end of the tube with the opposed marginal portions of the plates engaged with said inwardly bent edges of the tube at the split and engaged with the two rows of panel-engaging means opposed to the split retaining said plates within the tube.

15. A door structure as defined in claim numbered 14, characterized in that one of said plates is received within the end of the tube on one side of the panel and the other of said plates is received within the same end of the tube on the opposite side of the panel, and each plate has a portion which overhangs the end of the tube and is provided with a cushion wear portion which projects laterally beyond the tube.

16. A sliding door as defined in claim numbered 14 characterized in that said plates have portions which overhang opposite sides of the end of the tube and are provided with cushion wear strips which project laterally beyond the opposite outer faces of the tube.

17. A sliding door as defined in claim numbered 6 characterized in that said plates have portions which straddle a margin of the panel within the tube and grippingly engage opposite faces of said panel.

18. In a sliding door, a flat panel, a split tube extending along over and embracing the margin of the panel, a roller assembly consisting of a roller journaled between a pair of side plates, said side plates having spaced complementary portions telescoped into one end of the tube straddling a margin of the panel within the tube grippingly engaging the opposite sides of the panel.

19. In a sliding door of the character defined in claim numbered 18 and having a roller assembly comprising side plates as defined in said claim, said side plates having portions engaging opposite sides of the interior of the tube on opposite sides of the panel detachably securing the roller assembly within the end of the tube.

20. In a sliding door of the character defined in claim numbered 18 and having a roller assembly comprising side plates as defined in said claim, said side plates having oppositely projecting marginal portions engaging opposite sides of the interior of the tube, two of said marginal portions engaging the interior wall of the tube along opposite sides of the split.

21. A sliding door of the character defined in claim numbered 18 wherein that portion of the wall of the tube opposite to the split is shaped interiorly to define panel engaging means which engages opposite sides of the panel along the margin thereof and the side plates of the roller assembly are provided with oppositely projecting marginal portions engaging said panel engaging

means and engaging opposite marginal portions of the tube on opposite sides of the split positioning said roller assembly within the tube.

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