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3,461,466

MULTIDOOR SHOWER ENCLOSURE

Filed April 10, 1967

2 Sheets-Sheet 1

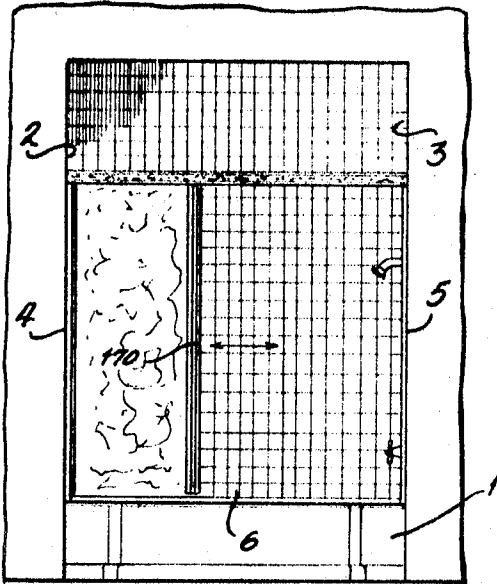


FIG. 1

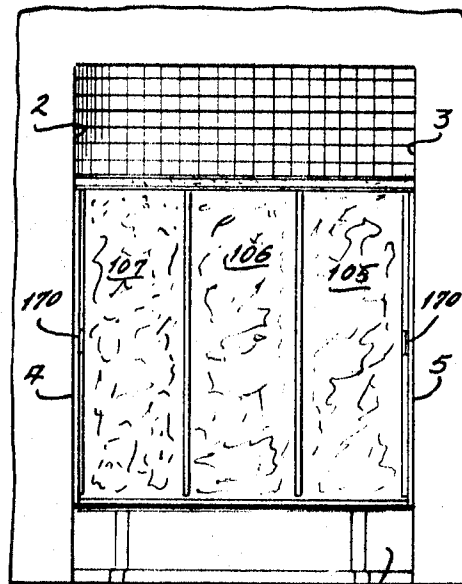


FIG. 2

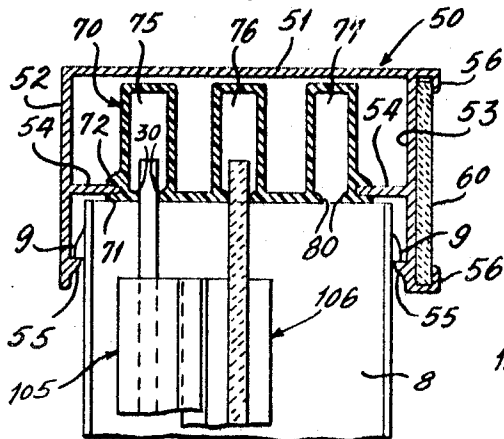


FIG. 5

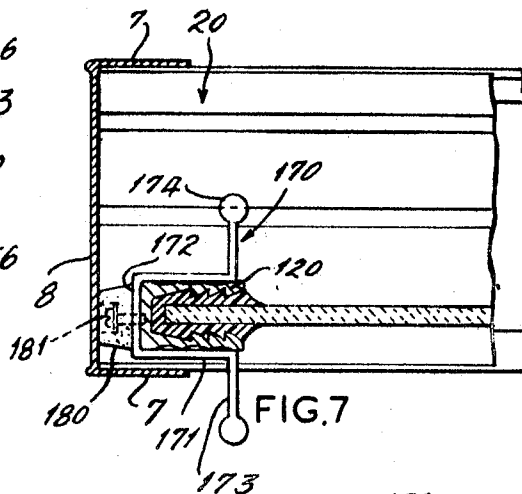


FIG. 7

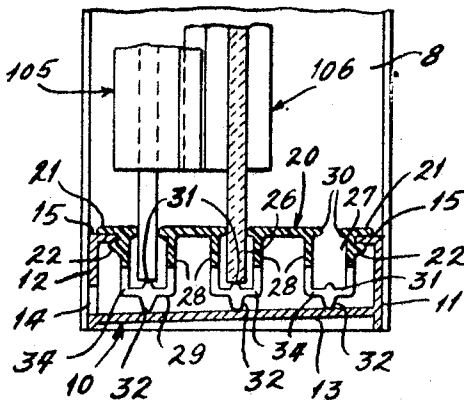


FIG. 6

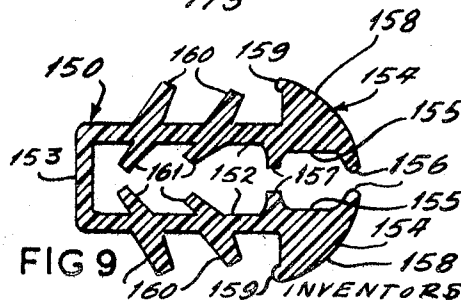


FIG. 9

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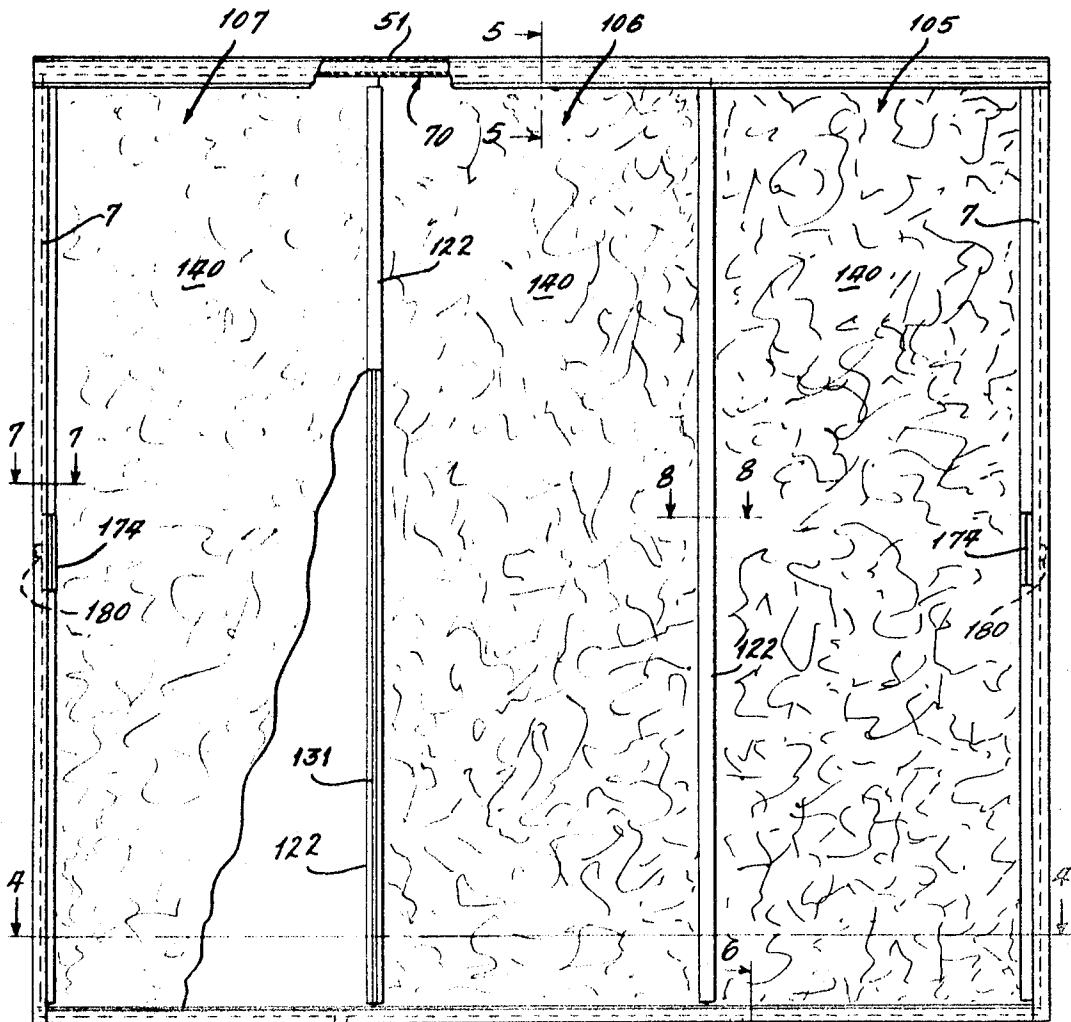


FIG. 3

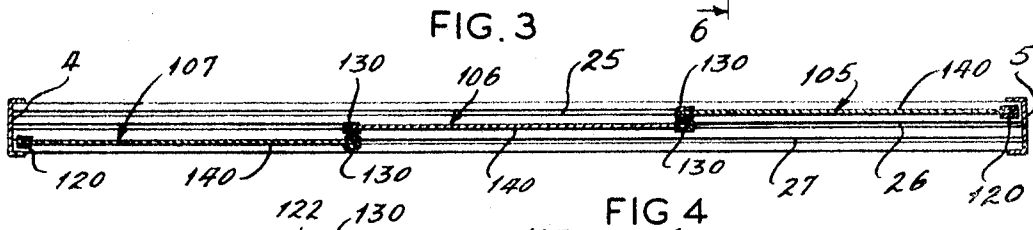


FIG. 4

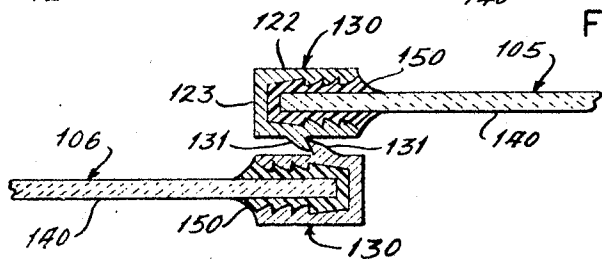


FIG. 8

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MULTIDOOR SHOWER ENCLOSURE

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6 Claims

ABSTRACT OF THE DISCLOSURE

A three panel tub door system with a tub rail, top rail, wall jambs connecting the tub rail and top rail, a polyvinyl chloride (PVC) extruded tub rail runner mounted on the tub rail and a top rail runner mounted on the top rail, and three doors which include a relatively thin panel, slidably mounted within and between the tub rail runner and the top rail runner in three separate channels. Each door has along two long edges of its panel a stile at least one of which has a projecting lip which engages a complementary lip of a contiguous door stile. The stiles end short of the bottom edge of the door panel and the door panel rests for sliding on the bottom surface of the tub runner. The stiles are mounted on the panel edges by means of an extruded PVC spline with serrations complementary to serrations on inside surfaces of the stiles.

The tub rail and jamb members are cemented to wall and tub surfaces. The tub rail runner and top rail runner are arranged to snap into the tub rail and top rail respectively. A fascia panel is mounted in channels in the top rail.

A snap fit door handle is adapted to embrace the door stile. The doors are invertible, hence reversible for either right or left hand installation.

Background of the invention

Most tub and shower door installations now known have either a hinged door or a single or double sliding door, in either case generally made of glass. Such assemblies have required self-supporting heavy frames and have not lent themselves to the kind of easy installation which would encourage home owners to attempt their assembly or installation.

One of the objects of this invention is to provide a tub or shower enclosure which is so easily assembled and installed as to enable even the unskilled to assemble and install it.

Another object is to provide such an assembly which is economical to produce, light in weight, sturdy, attractive in appearance, and easy to maintain.

Still another object is to provide such an assembly which as applied to a tub, makes entry to the tub, and cleaning of the tub easier than enclosures known heretofore.

Other objects will become apparent to those skilled in the art in the light of the following description and accompanying drawings.

Summary of the invention

In accordance with this invention, generally stated, a multidoor enclosure is provided which includes a bottom rail, a top rail, wall jambs extending vertically between the bottom rail and top rail, a bottom rail runner on the bottom rail, a top rail runner on the top rail, each of the runners having a multiplicity of parallel channels for a multiplicity of doors slidably mounted within and between the bottom rail runner and top rail runner. Each of the doors is journaled for sliding in a different channel. Each of the doors includes a relatively thin panel and, along each of the two long edges, a stile. At least one of the

stiles on each panel has a projecting lip adapted to engage a complementary lip of a contiguous door stile. The stiles end short of the edges of the door panel and the door panel rests for sliding on a channel bottom-defining surface of the bottom runner. In the illustrative embodiment shown and described, the bottom rail is a tub rail and the bottom runner, a tub runner, and the rails and runners are made separately and assembled when the enclosure is assembled in place.

In the preferred embodiments, the two runners are made of a slick surfaced plastic and are constructed to snap into the two rails. The door panels are also made of plastic which has a low coefficient of friction with the plastic of which the runners are made.

The stiles are mounted on the channels by means of a resilient spline which embraces the edges of the panel and is in turn embraced by the stile, and is made with serrations which are complementary to serrations on the inner surface of the stiles. A handle is made for a snap fit with the stiles. The stiles terminate short of the end edges of the panels, so that the stiles do not engage the runners, and the doors can be inverted to adapt to either right hand or left hand installation. A fascia strip is mounted in a channel in the top rail.

The bottom or tub rail and the two jambs are adapted to be cemented to permanent wall and tub or floor structures.

The entire assembly is adapted to be installed without the use of tools, and in a few minutes. The assembly can be adjusted to various different spaces, both as to height and length, with no more than a simple hacksaw.

Brief description of the drawing

In the drawing, FIGURE 1 is a view in front elevation of a bath tub-shower combination equipped with one illustrative embodiment of three door tub enclosure of this invention, with the doors in open position;

FIGURE 2 is a view in front elevation of the installation shown in FIGURE 1, with the doors closed;

FIGURE 3 is an enlarged view in front elevation, partly broken away, of the assembly shown in FIGURE 2;

FIGURE 4 is a sectional view taken along the line 4-4 of FIGURE 3

FIGURE 5 is a sectional view taken along the line 5-5 of FIGURE 3;

FIGURE 6 is a sectional view taken along the line 6-6 of FIGURE 3;

FIGURE 7 is a sectional view taken along the line 7-7 of FIGURE 3;

FIGURE 8 is a sectional view taken along the line 8-8 of FIGURE 3; and

FIGURE 9 is a cross-sectional view of one embodiment of spline member, much enlarged.

Description of the preferred embodiments

Referring now to the drawing for one illustrative embodiment of enclosure assembly of this invention, reference numeral 1 indicates a bathtub built into a niche defined at its ends by vertical walls 2 and 3, which face one another at the head and foot ends, respectively, of the tub. A shower head projects from the wall 3.

A left jamb 4, in the form of a wide channel defined by sides 7 and a web 8, has its lower end resting on the upper, outer edge of the tub 1, and is cemented, by means of an appropriate adhesive, to the wall 2. A right jamb 5 identical to the left jamb 4, is aligned opposite the left jamb 4, and cemented to the wall 3, with its lower end resting on the rim of the tub 1. A tub rail 10 is of a width snugly to fit between the sides 7 of the jambs 4 and 5, and of a length to fit within the embrace of the jambs at both ends. The tub rail can be cemented along the rim of the tub, or at its ends to the sides of the jambs, or it

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can be press fit into place between the jambs or firmly mounted in any other suitable way. The tub rail includes parallel side walls 11 and 12, a pair of flanges 15 projecting inwardly, toward one another, from the top edges of the walls 11 and 12, and a bottom 13 which slopes downwardly from the wall 11 to the wall 12 as shown particularly in FIGURE 6. The wall 12 has a number of drainage ports 14 at the level of the bottom 13.

A tub rail runner 20, of the same length as the rail 10, is mounted between the flanges 15 of the walls 11 and 12, and rests on the upper surface of the bottom 13. As is seen most clearly in FIGURE 6, the runner 20 is provided at each side with a pair of continuous, longitudinally running spaced lips 21 and 22, the upper, outer lip 21 being the wider. Between them, the lips 21 and 22 define a groove, to admit the inner edge of the flange 15. The runner 20 has three parallel channels 25, 26, and 27, defined by side walls 28, bottom walls 29, and sealing beads 30. For each channel, a bearing rib 31 extends lengthwise along the upper surface of the bottom wall 29, and a supporting rib 32 extends along and projects downwardly from the bottom wall 29. The supporting rib 32 of the channel 25 is deeper than the supporting rib 32 of the channel 26, which in turn is deeper than the supporting rib 32 of the channel 27, so that the channels, which are of the same depth, are supported uniformly by the sloping bottom 13, even though the upper surface of the runner 20 is substantially horizontal. The channels 25, 26, and 27 are provided with drain slots 34, spaced along their length.

The runner 20, in the illustrative embodiment shown, is made of polyvinyl chloride, and, while it is not limber, it has sufficient resilience to permit the runner to be snapped into the rail. It will be noted that the lips 22 are chamfered along their lower edges, to help cam the lip 22 past the inner edge of the flange 15 on the walls 11 and 12, when the runner 20 is pushed down.

An upper rail 50 extends between and rests on the jambs 4 and 5. The top rail 50 has an upper wall 51, an inner side wall 52, an outer side wall 53, inwardly projecting shelves 54 aligned with one another and projecting inwardly from the walls 52 and 53 at a distance from the outer edge of the walls, and a splay rib 55 on the inside surface of the walls 52 and 53, near but a short distance in from the outer edge of the walls. The outside wall 53 has along both of its long edges, L shaped channel-defining angles 56, between which, and within the compass of which, a fascia strip 60 is slidably mounted.

A top rail runner 70 has lips 71 and 72, which define between them a groove which receives the inner edges of the shelves 54. As in the case of the lip 22, the lip 72 is beveled to permit the runner 70 to be snapped into the rail 50 by pushing the runner toward the wall 51, as will be evident from an inspection of FIGURE 5. The runner 70 has three channels, 75, 76 and 77, parallel to and aligned vertically with channels 25, 26 and 27 respectively of the tub rail runner 20. However, the channels 75, 76, and 77 are substantially deeper than channels 25, 26, and 27. The mouths of the channels 75, 76, and 77 are defined by guide beads 80.

An emboss or catch 9 is lanced out and projects outwardly from each of the side walls 7 of the jambs 4 and 5, as shown in FIGURE 5. The splay ribs 55 are positioned and spaced to snap over the catches 9 and engage the lower edge of the catches, to hold the top rail 50 in position.

Referring now to FIGURES 1-4, and particularly the latter figure, three doors 105, 106, and 107 are removably and slidably mounted in and between the channels 25 and 75, 26 and 76, and 27 and 77 respectively. Doors 105 and 107 can be identical in structure. Each has a leading or handle stile 120 and a following, lip stile 130. The door 106 has two lip stiles 130, one of which is so mounted that a lip 131 projects from one side of the door, the other, from the other side of the door, as shown particularly in

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FIGURE 4. Both the leading stiles 120 and the lip stiles 130 are open channels with side walls 122 and a web 123. The inside surfaces of the side walls 122 are serrated.

The stiles 120 and 130 are mounted on relatively thin plastic decorative panels 140 by means of plastic splines 150.

Each of the splines 150, in the illustrative embodiment shown, consists of a channel member with side legs 152, a web 153 connecting the side legs at one of their ends, and a head 154 on each of the side legs along the edge opposite the web 153. The heads 154 have mouths 155, defined by outer lips 156 and inner lips 157 which face one another, and a quarter round moulding part 158, extending from the outer lip 156 outwardly to a sealing bead 159. On the outside of each of the legs 152, are fins 160, which project away from the leg 152 in a direction toward the sealing beads 159. On the inside of the legs 152, are fins 161 which project inwardly from the legs 152 in a direction away from the head 154.

A handle 170 is mounted on the leading stile 120 of both of the doors 105 and 107. In the embodiment shown, which is the preferred embodiment, the stiles 120 are symmetrical about the long center line of the web, and have on both long side surfaces flutes, running lengthwise of the stile. The handle 170 has a U shaped channel part, made up of legs 171 and a connecting web 172, wings 173 extending outwardly from the edges of the legs 171 and a cylindrical finger boss 174 extending along the outer edges of the wings 173. The span of the web 172 and the spring of the legs 171 are such as to provide a snap fit of the handle 170 on the stile 120, as shown in FIGURE 7. However, because it is desirable to provide a resilient bumper 180 in any case, the web 172 is drilled, and the stile web is tapped to receive a screw 181, which serves to hold the bumper 180 and to give additional assurance that the handle 170 will not move axially of the stile 120.

It can be seen that every part of the enclosure assembly illustrated and described except the bumper 180 and its screw 181, can be extruded. The rails, jambs, stiles, and handles, are, in this embodiment, extruded from aluminum. The decorative panels and the fascia strip are preferably extruded from acrylic or polystyrene resin, and the runners and splines are preferably extruded from polyvinyl chloride, the runners from a so-called rigid PVC and the splines from what is described as 60 durometer Shore A vinyl.

In the installation and assembly of the system illustrated and described, if the length of the tub and the height to which the enclosure is to rise are standard, the doors 105, 106, and 107 can be pre-assembled to the extent of mounting the stiles 120 and 130 and the handles and bumpers. To this end, the spline 150 can be mounted on the edge of the panel, and the stile forced down over the spline until the serrations of the stile clear the complementary fins 160 of the spline, at which point the sealing beads 159 will engage the outer edge of the legs of the stile, sealing against the outer edge, and tending to rock the lips 156 into tight engagement with the panel. The stiles are all centered with respect to the vertical height of the panels, and end short of the top and bottom edges of the panels by an amount a little greater than the depth of the channels 75, 76, and 77 in the top rail runner 70. The panels themselves are of a height greater than the distance from the top of the bearing rib 31 of the tub runner to the mouth of the channels of the top runner, and less than the distance from the mouth of the channels of the tub runner to the inner surface of the web of the corresponding channels of the top runner.

If the handles 170 have not been installed, they are now merely snapped over the stiles 120 with the hole in the handle web aligned with the tapped hole in the stile, and the bumper 180 is mounted by means of the screw 181. As has been indicated, this is ordinarily done before the assembly is shipped, because the length of bathtubs

is generally a standard length and the doors accommodate themselves automatically to small variations in total span. However, it can be seen that for special installations, one or more of the panels can be trimmed with a saw, and a stile mounted at the site of installation. Similarly, most installations will be of a standard height, but if a lesser height is desired, the panels and stiles can be cut off very easily and the stiles then mounted at the site.

In installing the assembly, adhesive is placed on the back of the web of the jambs, and the jambs are cemented to the walls, with the emboss or catch at the upper end. The tub rail and runner are cut, if necessary, to fit snugly between the jambs, and the rail is adhered to the tub by means of adhesive, with the drain openings to the inside of the tub. The tub rail runner is then snapped in, with the longest of the supporting ribs on the drain side of the tub rail. The wall to wall span between the jambs at the top of the jambs is then measured, and, if necessary, the top rail, top rail runner and fascia strip are cut to fit the span. The top rail runner is snapped into the top rail, the fascia strip is slid into its channel from one end of the rail, and the top rail assembly is snapped into place on the tops of the jambs, with the splay ribs snapping under the catches.

The doors are then mounted in their respective channels by inserting the upper edge of the panel of the door into the appropriate top rail runner channel and moving the panel up until the lower edge of the panel clears the top of the tub runner, when the panel can be moved to align with the appropriate lower channel and permitted to drop down until the bottom edge of the panel rests on the bearing rib. The lapping arrangement of the panels is shown clearly in FIGURE 4. It can be seen that since the stiles are mounted symmetrically lengthwise of the panels, the panels can be inverted, to accommodate a shower head at either end. The overlap of the doors should be in the direction in which the shower head is projecting. For example as viewed in FIGURE 4, if the shower head is above the figure it would project from the right toward the left. The tub rail runner is preferably given an initial lubrication with a silicone lubricant.

Numerous variations in the construction of the enclosure of this invention, within the scope of the appended claims, will occur to those skilled in the art in the light of the foregoing disclosure. Merely by way of example, the bottom rail and bottom rail runner can be made as one extruded plastic part, as can the top rail and top rail runner. A fascia strip can be provided on both sides. The enclosure may be adapted to other uses besides that of a tub enclosure. These are merely illustrative.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. In a multi-door tub enclosure wherein the doors are made up of relatively thin panels and stiles mounted on long edges of said panels, the improvement comprising stile means U-shaped in cross section having side walls and a connecting web, inside surfaces of said side walls being serrated, and spline members, made of resilient material, said spline members being U-shaped in cross section with side legs embracing an edge of a panel, a connecting web, and a head extending along the outer edge of each side leg, said head having an outwardly projecting shoulder member with a sealing bead on its outer edge and a mouth defined by spaced inwardly extending lips, said side legs having outwardly extending fins projecting toward said head and inwardly extending fins projecting away from said head, said outwardly extending fins being located complementarily to said stile serrations and said head being located to bear against the outer edges of the stile legs whereby to rock said head about the inner lip to force the outer lip into tight engagement with the panel.

2. A multi-door tub enclosure comprising a tub rail

having side walls, inwardly projecting flanges on said side walls, and a sloping bottom; a top rail; wall jambs extending vertically between said tub rail and said top rail at the ends thereof; a tub rail runner mounted on said tub rail, having outwardly projecting upper and lower lips embracing said flanges; a top rail runner mounted on said top rail and aligned with said tub rail runner, each of said runners having a multiplicity of channels, and a multiplicity of doors which includes a relatively thin panel, slidably mounted within and between said tub rail runner and top rail runner, each of said doors being journaled for sliding in a different channel of said runners, each of said doors having along each of two long edges of its panel a stile at least one of which stiles has a projecting lip adapted and positioned to engage a complementary lip of a contiguous door stile, said stiles ending short of the bottom edge of the door panel on which they are mounted and the said door panel resting for sliding on a channel bottom defining surface of the tub runner.

3. A multi-door tube enclosure comprising a tub rail, a top rail, wall jambs extending vertically between said tub rail and said top rail at the ends thereof, a tub rail runner mounted on said tub rail, a top rail runner mounted on said top rail and aligned with said tub rail runner, each of said runners having a multiplicity of channels and each of the tub runner channel bottom walls having an upwardly projecting bearing rib, and a multiplicity of doors which include a relatively thin panel, slidably mounted within and between said tub rail runner and top rail runner, each of said doors being journaled for sliding in a different channel of said runners, each of said doors having along each of two long edges of its panel a stile at least one of which stiles has a projecting lip adapted and positioned to engage a complementary lip of a contiguous door stile, said stiles ending short of the bottom edge of the door panel on which they are mounted and the said door panel resting for sliding on a channel bottom defining surface of the tub runner.

4. The improvement of claim 2 wherein each of the tub runner channel bottom walls has a downwardly extending supporting rib, the channels being of uniform depth and the ribs being of different heights, whereby the ribs all rest on the sloping bottom of the tub rail when the bottom walls of the channels are in a horizontal plane.

5. The improvement of claim 2 wherein the lower lips are chamfered on their under surface and the runner is sufficiently flexible to permit the lower lips to cam over the flanges and snap into place below the flanges when the lips embrace the flanges.

6. The enclosure of claim 2 wherein the top rail has an outer side wall and facing upper and lower angles projecting from the upper and lower edges thereof to define with the face a channel, and a fascia strip slidably mounted in said channel.

References Cited

UNITED STATES PATENTS

2,197,385	4/1940	Ricken	4-149
2,850,089	9/1958	Burke	160-202
2,851,695	9/1958	Dietrich	4-154
3,074,077	1/1963	Taubman	4-149
3,102,581	9/1963	Kuehanowski	160-196
3,111,208	11/1963	Grossman	4-149
3,348,603	10/1967	Ford	160-202

FOREIGN PATENTS

540,444	5/1957	Canada.
575,102	5/1959	Canada.
656,549	1/1963	Canada.

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