A shower stall door is fastened to a pivot pole between the center of the door and one edge of the shower stall. On pivoting the door on its pivot pole, which is outside the door, a substantially waterproof and water-deflecting construction results when the door is closed.

6 Claims, 8 Drawing Figures
PIVOTED SHOWER STALL DOOR

This is a continuation, of application Ser. No. 143,420, filed May 14, 1971.

BACKGROUND OF THE INVENTION

Doors for shower stalls have presented some problems, particularly with modern molded shower stalls or shower enclosures, which often do not have rectangular corners. In the past doors have usually been hung on one side. This creates problems, especially with heavy doors, such as glass doors. The jambs on which the door swings requires fairly heavy construction and often creates a problem in installation, especially with molded shower stalls or shower enclosures, which are becoming increasingly more popular. An even more serious problem is created by the necessity for preventing leakage of water from the shower to flow out onto the bathroom floor. The leakage problem is made more difficult because with the ordinary type of door it is difficult to maintain a suitable closure at the bottom. Of course with practically any shower enclosure there is no room to open the door inwardly, and any slight misalignment or provision for sagging can result in a gap between the bottom of the door and the raised sill of the shower enclosure. Any gap of significant size can permit water from the shower to flow out on the bathroom floor. Also, there is a considerable problem presented by the door hinge to the jambs, which must be tight all the way up as otherwise water can leak out, especially as this side of the door is generally opposite the wall in which the shower head is mounted and therefore there is a considerable force of water against this side when, as is often the case, the shower head is adjusted so that the shower has considerable horizontal extent, which is desired by many users.

Another type of door is in extensive use, particularly with larger enclosures where, for example, the shower may be combined with a built-in-tub. This type of door is a double sliding door and can be made quite watertight. It also does not present any sagging problem. However, the tracks, which are generally in the form of aluminum or other metal channels, have edges which, although not sharp, are very uncomfortable if stepped on in getting into the shower or leaving it. This can be quite painful and may even sometimes result in minor injury. Also, of course, the sliding doors, which are used very extensively on enclosures which include a built-in-bathtub, are not usually suitable for shower stalls as generally the opening is not sufficient to permit sliding doors, which, after all, present only half the width of the opening for entering or leaving the shower. All in all the shower enclosure doors which have been used hitherto are not a perfect solution to the problem, and it is with an improved type of door, especially useful for molded shower stalls, that the present invention deals.

SUMMARY OF THE INVENTION

The doors of the present invention fit on the inside of a pivot post which is off center, and so when the door is opened leave sufficient room for entrance and egress, whereas sliding doors, for example, would restrict the opening unduly. The door proper, which presents a single unbroken surface on its inside, cannot sag because it is attached to the pivot pole in several places, and the fact that the door pivots with part of it swinging into the enclosure and part of it swinging out makes sagging practically impossible with light doors, such as, for example, those of plastic sheets, and even with heavier material, such as glass, reduces the sagging problem so greatly that for practical purposes it no longer presents any serious problem.

The pivoting door with the pivot pole outside of the door proper also provides almost complete protection against any water leakage, especially at the far edge of the door, that is opposite the shower head, which, when the door is closed, is on the inside of a flange or molding of the enclosure. Any water striking the door, even with considerable force if the shower head has been turned to project the shower somewhat forward, is deflected by the unbroken surface of the door and thrown back into the enclosure, thus eliminating substantially, and in most cases completely, any problem of water leakage.

With most mechanical constructions a great improvement in one characteristic is often somewhat offset by some disadvantages, which may be increased cost of installation or other drawbacks. In the present case the advantages of watertightness, sag elimination, and the like are obtained with a very inexpensive construction, particularly in the case of molded enclosures where the mountings for the pivot pole can either be integral or, if separate mountings are used, which is often desirable, the enclosure provides simply and inexpensively for mounting holes, such as threaded holes. Also, as will be more apparent in the description of a typical example below, installation is very simple and with lighter doors is even practical for installation by a single man, which is an important advantage as more and more the cost of labor becomes of predominant importance. Another accompanying advantage is that the construction does not produce sharp or rough edges and lends itself to a smooth and attractive appearance.

Mountings for the pivot pole, which of course turns with the door itself, require quite simple constructions. The top mounting requires only a hole into which a short, round extension on the pivot pole proper is inserted. In a preferred form of the invention practically all of the weight of the door and pivot pole is supported by the bottom of the pivot pole and its mounting. This can be a plain bearing surface because there is no substantial binding force as in a door hinged at one side. In a more specific aspect of the invention there is, however, included a special form of the bottom of the pivot pole and its mounting. In addition to the projection which extends into a hole as in the top, there are rollers attached to the bottom of the pivot pole, preferably a pair, and the bottom mounting is provided with shallow, rounded indentations placed so that the rollers permit the pole to drop slightly as they roll into an indentation and hold the door in its two extreme positions, that is to say, fully opened and fully closed. The indentations are so shallow that it is not necessary for the projection at the top of the pole to project any large distance into the opening in the top mounting plate. It need only be sufficiently long to permit the very slight dropping of door and pole when the rollers roll into the shallow indentations. At the same time, the rollers prevent binding and carry the whole weight of the door and pivot pole with little or no friction and no binding. This makes the door very easy to swing to its open or closed position and is an added advantage of this spe-
cial and preferred construction. As far as effort of moving the door is concerned, the problem is not serious even without rollers, but the rollers do make opening and closing still less effort.

It will be noted that the door proper is inside the enclosure edge at least at the far side, and this permits one of the major features of the present invention, namely the deflection of the shower. It is usually desirable to prevent the door from pivoting beyond the fully opened position, and for this purpose it is usually desirable to have a resilient stop screwed into a suitable threaded hole in the bottom mounting for the pivot pole. This stop is not essential in the preferred form where rollers and shallow depressions produce a detent-like action but is normally desirable, and as it does not add anything significant to the cost and makes careless or violent opening of the door beyond its fully opened position impossible, it is a desirable though less important additional feature. The protection against undue opening of the door or too violent an opening is of particular significance when the shower is used by children, who are often less careful in opening doors.

It will be noted that the far edge of the door when completely closed does not have to actually touch the inside of the side molding because the full extent of the door will deflect any water striking it. With plastic doors, such as heavy acrylic sheets, the plastic is sufficiently soft so that even if it transiently touched the molding, no scratching would result. With harder doors, such as glass doors, if desired, small patches of resilient material top and bottom may either be attached to the door or to the side molding when this additional protection is felt to be worthwhile.

The door is ordinarily provided with a handle on both sides which can readily be mounted with through bolts as will be shown in the more specific description below. This handle also preferably is provided with an extension having a resilient portion contacting the outside of the enclosure molding. This is a desirable additional feature though not absolutely essential.

It is an advantage of the present invention that various readily available materials can be used both for door pivot pole and its top and bottom mountings. While it is possible with very light doors, such as, for example, shower acryllic doors, to use plastic for the pivot pole, usually it is preferred to use a hollow aluminum or other metal extrusion which can be polished and present an attractive external appearance. When metals other than aluminum are used, it is often desirable to plate the outside of the pivot pole with a decorative plating, such as chrome plating. In the case of aluminum it is, of course, also possible to anodize the aluminum, which permits a further possibility for decorative color.

Usually the top and bottom mountings are of metal, although of course they can be integrally molded into a shower enclosure. This is a relatively inexpensive construction and so detachable metal plates are preferred. The rollers, of course, may be of any material that is suitable and may, if desired, have a soft periphery, such as an elastomer. With plastic rollers, such as, for example, nylon rollers, the roller can be all of the same material.

It is possible to have the pivot pole so accurately dimensioned with respect to an enclosure opening that it can be installed by sliding the extension at the top of the pole into the opening of the corresponding fitting sufficiently far so that the bottom extension of the pole can be dropped into the mating hole on the bottom fitting. However, it is easier to install the door after it has been fastened to the pivot pole by first introducing the extension into the hole in the bottom mounting; the door then resting on its rollers. Adjustment at the top can be effected by having the extension movable in the hollow pivot pole and clamping, for example by threaded bolts and a slot. This permits mounting the door and pivot pole first into the bottom mounting, holding it perfectly upright, sliding the extension into the top mounting, and then clamping it there. This is the preferred form for mounting the door and pivot pole and has the additional advantage that it permits a little greater adjustment than would otherwise be possible. As with most shower enclosure doors, the door does not extend all the way up the enclosure as the shower head is somewhat below the top and the shower is directed down. This also permits better ventilation and quicker drying after a shower has been taken. In such a more or less standard dimensioning of the door, the pivot pole, of course, extends above the top of the door.

The most important field of utility of the door of the present invention is in shower enclosures, and this is what will be described as a specific and preferred illustrative embodiment. However, it should be noted that it is possible to use the construction of the present invention for doors for other uses, for example closet doors. In such cases usually the door will extend to the end of the pivot pole at the point where the extension into the top fitting protrudes. Also, for other uses, such as, for example, closet doors, other materials are often preferable, such as wood, with or without ventilating louver construction, and the like. It is an advantage of the present invention that the door can be of any desired material, and this adds to the versatility of the invention. Of course when used in closets or other similar locations, the important feature of shower deflection is not encountered. However, the smooth, uniform inner surface of the door is still of advantage as it prevents catching garments or other articles in the closet. If used on doors leading to the outside, a field of utility for which the present invention is not as well suited, suitable weather stripping of edges is needed. Therefore, even outside doors are not excluded from the broader aspects of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of a shower enclosure with the door closed;
FIG. 2 is a vertical section along the line 2—2 of FIG. 1;
FIG. 3 is a horizontal section along the line 3—3 of FIG. 1;
FIG. 4 is a detail of the top of the pivot pole;
FIG. 5 is a section through the top of the pivot pole and its mounting in the enclosure top;
FIG. 6 is a plan view of the bottom mounting showing the bottom of the pivot pole in place;
FIG. 7 is a side view of the bottom of the pivot pole mounting and a portion of the enclosure floor, and
FIG. 8 is a plan view of the top of the door showing mounting to the pivot pole exploded.
DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGS. 1 and 2 show the enclosure 20 with a recessed pocket 1 in the top threshold of the enclosure and a similar recessed pocket 2 in the bottom threshold. A door 7 is attached to a pivot pole 6, which in FIG. 1 is shown with a top mounting bracket 3 and bottom mounting bracket 4 and with pivot pole insert 17 at the bottom and an adjustable pivot pole insert 14 at the top. These inserts extend through holes in the top and bottom mounting brackets and into the recessed pockets in the top and bottom thresholds. In order to avoid confusing the small scale of the drawing in FIG. 1, the details of the pivot pole, including adjustment of the top pivot pole insert and rollers on the bottom of the pivot pole are omitted. This construction will be seen clearly in FIGS. 4 and 5 for the top pivot insert and FIGS. 6 and 7 for the bottom bracket. The more detailed construction will be described below in conjunction with these figures.

FIG. 1 shows a handle 12 on a door with a jamb stop 13 and also shows projections 23 and 24 at the bottom of the molded enclosure 20 which fit into the building wall construction, (not shown). A shelf for soap and other articles is shown at 22 in full in FIG. 2 and in phantom in FIG. 1.

FIG. 3, which is a horizontal section looking down, shows the bottom 19 of the enclosure with a drain 21. One corner is shown broken away so that the projections 23 and 24 can also be seen in this figure.

FIG. 8 is a top plan view of the door showing the handle 12 and also shows the mounting of the jamb stop 13 and of the door to the pivot pole 16, these attachments being shown exploded. The jamb stop 13 is fastened to the handle 12 with a short screw 25, and the door is fastened to the pivot pole 6 by a longer screw 10 passing through a plastic cap 9 on one side of the door and a rubber washer 8 between the door and the pivot pole. The head of the screw 10 is concealed by a decorative plastic insert 11 which fits into the plastic cap 9 in the recess shown in phantom in the figure.

FIGS. 4 and 5 illustrate the mounting of the top of the pivot pole 6. In FIG. 5 the bracket 3 is shown attached to the upper threshold of the enclosure by screws 26, which are shown in exploded form in the figure. The pivot pole insert 14 slides in the hollow pivot pole 6 and is clamped in the position for the right amount of extension of the pin on the end of the insert through the hole in the top mounting bracket 3 by means of two screws 28 which pass through a slot 15 into threaded holes 27. As with the screws 26, the screws 28 are shown in exploded form. The slot 15 and the heads of the screws 28 can be seen more clearly in FIG. 4, which shows the insert 14 clamped at approximately its highest point.

FIGS. 6 and 7 are details of the bottom mounting bracket 4 and the mounting of the pivot pole 6 therein. It will be seen that there is a pair of rollers 16 mounted in the bottom of the pivot pole 6. They extend slightly below the end of the pivot pole but not below its insert 17, which passes into a hole 29, which can be seen in FIG. 6. FIG. 7 shows in exploded form the fastening of the bottom mounting bracket 4 to the bottom threshold of the enclosure. The fastening is by screws 30, shown exploded, which are of different lengths because of the slope of the bottom of the enclosure, which can be clearly seen in FIG. 7. These screws pass through three of the holes 31 at the corners of the bracket 4, as can be seen in FIG. 6. In the fourth hole there is a threaded door stop pin 5, the top of which is of elastic material. The bottom bracket 4 is provided with two pairs of shallow indentations 18 into which the rollers 16 drop when the door is either fully opened or fully closed. In FIG. 6 the door is shown in an intermediate position; and in FIG. 7, which shows the pivot pole just being inserted into the bracket 4, the rollers 16 are still above the level of the bracket. When the door is either fully opened or fully closed the rollers 16 drop into the indentations 18 and act as detents. The indentations are quite shallow and when the rollers drop into the indentations the pivot pole 6 drops only a short distance and the upper insert 14 is clamped in a position so that its pin does not drop out of the hole in the upper bracket 3 when the rollers are in their indentations 18. The jamb stop 13 strikes the jamb of the molding, as can be clearly seen in FIGS. 1 and 2.

I claim:

1. A shower stall door and enclosure opening construction comprising in combination,
   a. a door having a single unbroken surface on its inside which door extends to the bottom of the enclosure opening but not to the top of the enclosure opening,
   b. a vertical unitary pivot pole attached to the door on its outside at a point part way between the center of the door and one edge, said pivot pole having extension pins at top and bottom and said pivot pole extending above the top of the door,
   c. top and bottom mounting brackets attached to the walls of the enclosure opening and provided with central holes registering with the pins at the ends of the pivot pole, and
   d. handle and jamb stop elements attached to the edge of the door furthest from the pivot pole, whereby the door can be pivoted with the wider portion swinging out and the narrower portion swinging in.

2. A pivoted door construction according to claim 1 in which the bottom end of the pivot pole is provided with a pair of rollers extending beyond the end and rolling on the bottom mounting bracket.

3. A pivoted door construction according to claim 2 in which a resilient door stop is mounted in the bottom mounting bracket positioned to encounter the door when fully opened.

4. A pivoted door construction according to claim 3 in which the bottom mounting bracket is provided with a shallow depression into which the rollers drop when the door is fully opened or fully closed and provide a detent action.

5. A door construction according to claim 1 in which the pivot pole is hollow and provided with a sliding insert at the top carrying the pin and means for clamping this insert.

6. A door construction according to claim 2 in which the pivot pole is hollow and provided with a sliding insert at the top carrying the pin and means for clamping this insert.

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