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119, 359, 360, 467; 4/148

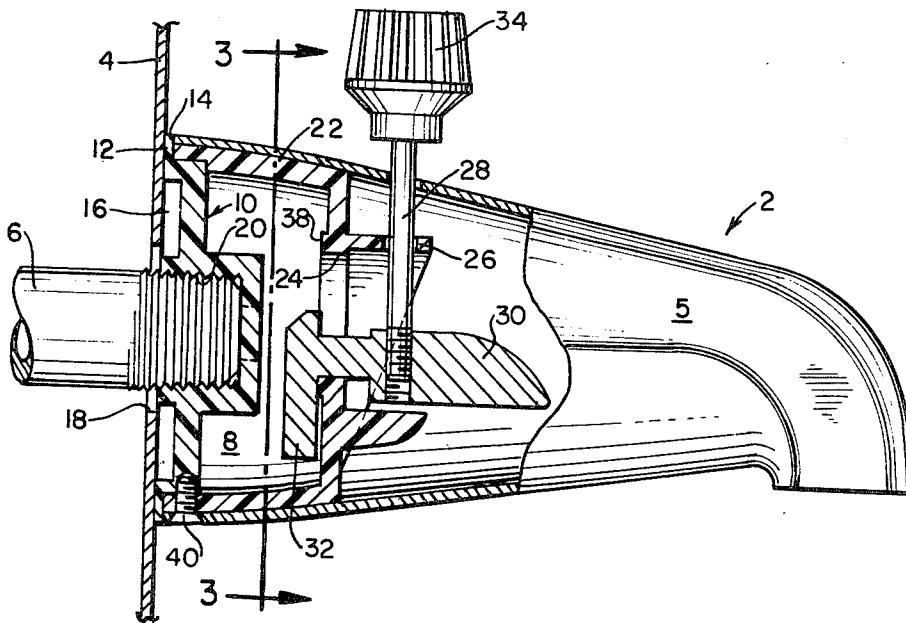
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[54] **DIVERTER SPOUT WITH PLASTIC PRESSURE CHAMBER**
9 Claims, 3 Drawing Figs.

[52] U.S. Cl..... 137/359,
137/467, 137/360
[51] Int. Cl..... F16k 31/44

ABSTRACT: A spout for diverting the flow of fluid has a plastic pressure chamber which is inserted into the fluid input end of the spout housing and which coacts with a diverter valve to prevent the flow of fluid through the spout housing.



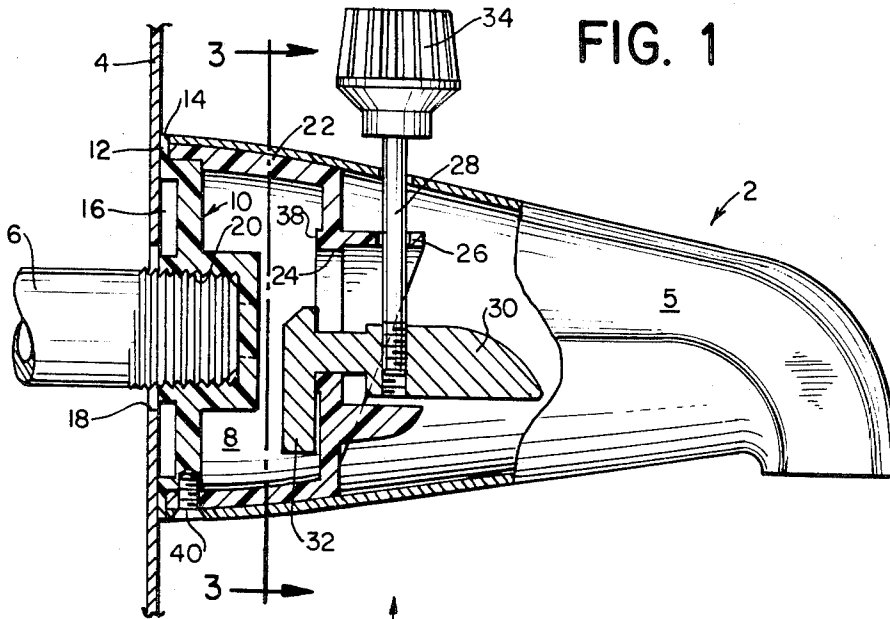


FIG. 1

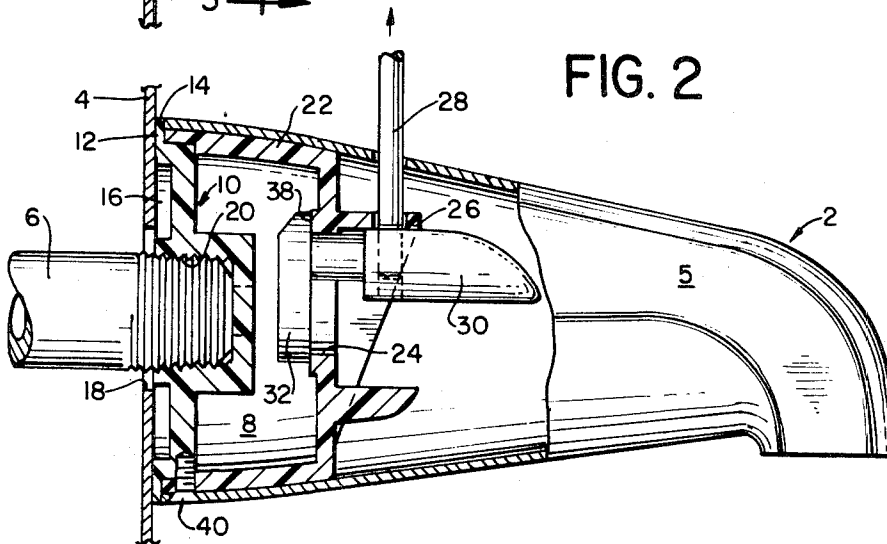


FIG. 2

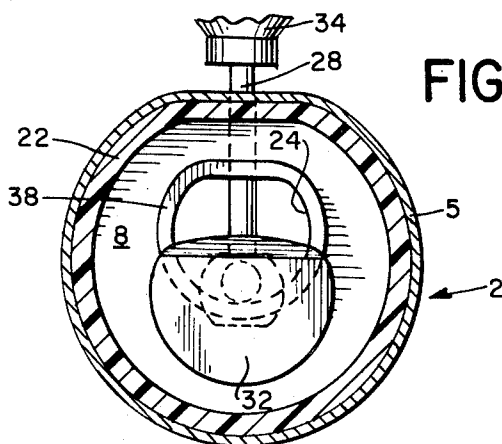


FIG. 3

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DIVERTER SPOUT WITH PLASTIC PRESSURE CHAMBER

A diverter spout is a conventional bathroom fixture which is usually mounted on a bathtub for diverting the flow of water away from the spout to an overhead shower fixture by a simple adjustment. The conventional diverter spout is composed of a corrosion-resistant metal housing and has a valve mechanism adjacent the fluid input end of the spout which includes a pressure chamber and a movable diverter valve which coacts with the pressure chamber to prevent the flow of fluid through the spout. In the conventional diverter spout, the pressure chamber has characteristically been cast of the same metal as the spout. Since the pressure chamber must be composed of highly corrosion-resistant material because of its extensive exposure to water and its movable parts, it has heretofore been customary to cast the entire diverter spout including the spout housing and the pressure chamber from a highly corrosion-resistant material, such as brass. This conventional diverter spout is relatively expensive to manufacture since the entire diverter spout is composed of an expensive corrosion-resistant metal.

It is accordingly an object of this invention to provide a diverter spout which is relatively easy and inexpensive to manufacture.

It is a further object of this invention to provide a diverter spout in which the spout housing component and the pressure chamber component are composed of different materials each suitable to the respective component function and are separately fabricated.

This invention provides a diverter spout which has a pressure chamber molded from plastic which is inserted into the fluid input end of the spout. Since it is not necessary to cast the diverter spout's pressure chamber, all that remains to be cast is the spout's housing, which is a relatively easy casting to manufacture. Furthermore, since the pressure chamber and the diverter spout housing are separately manufactured, it is not necessary that the diverter spout housing be composed of a material which is as highly corrosion-resistant as brass or the like. The spout housing (not being exposed to wear of movable parts) may be composed of a material which is corrosion-resistant to a lesser degree than the material which composes the pressure chamber and be treated with a noncorrosive coating. This considerably reduces the expense of materials involved in manufacturing the diverter spout.

Another feature of this invention is that the plastic pressure chamber insert has a lip which extends over the rim of the metal spout housing and prevents the rim of the housing from scuffing the surface against which the diverter spout is mounted.

These and other objects and features of this invention will be more readily understood and appreciated by reference to the following description and drawings of which:

FIG. 1 is a side elevational view partially cut away of the diverter spout of this invention illustrating the diverter valve in an open position;

FIG. 2 is a side elevational view partially cut away of the diverter spout of this invention illustrating the diverter valve in a closed position; and

FIG. 3 is a cross-sectional view of the diverter spout illustrated in FIG. 1 taken along the lines 3-3.

Referring now to FIGS. 1 and 2, a diverter spout 2 is illustrated mounted on a wall 4. A fluid input pipe 6 is threaded into the pressure chamber 8 of the diverter spout so that fluid may flow through the spout when the diverter valve is in an open position as illustrated in FIG. 1. The pressure chamber 8 is composed of a first member 10 which is substantially circular in cross section and the outer diameter of which is approximately equivalent to the outer diameter of the opening in the spout housing 5 directly adjacent the wall 4. The outer rim 12 of the first member 10 forms a lip against which the outer rim 14 of the diverter spout housing 5 seats. Since the diverter spout housing 5 is composed of metal and the pressure chamber 8 is composed of plastic, the outer rim 12 of the pressure chamber's first member 10 prevents the

diverter spout housing from scuffing the wall 4 against which the spout is mounted. Inwardly from the outer rim 12 of the pressure chamber's first member 10 is a circular-shaped recessed cavity 16 which is suitable for packing with a sealing material to prevent the leakage of fluid from between the outer rim 12 and the wall 4.

The fluid input pipe 6 extends through an opening 18 in the wall 4 and engages the threaded portion 20 of the first member 10 in order to deliver fluid to the pressure chamber 8.

The first member 10 of the pressure chamber 8 is ultrasonically welded to the second member 22 of the pressure chamber 8 along the border formed by the inner surface of the outer rim 12 of the pressure chamber's first member 10. The ultrasonic weld assures the integrity of the joint between the pressure chamber's first and second member and prevents any leakage of fluid from the pressure chamber. The pressure chamber's second member 22, which is also substantially circular in cross section, tapers slightly so that the pressure chamber 8 fits snugly within the tapering spout housing 5. The outermost surface of the pressure chamber's second member 22 engages the inner surface of the spout housing 5.

A shoulder 26, which extends horizontally from the pressure chamber's second member 22, has an opening therein through which valve stem 28 extends. The valve stem is threaded into a diverter valve 30 which may preferably be composed of a highly corrosion-resistant metal, such as bronze. The diverter valve 30 is formed so that the valve disc 32 is positioned directly adjacent the opening 24 in the pressure chamber 8. A knob 34 which is attached to the valve stem permits the diverter valve 30 to be manually lifted so that the valve disc 32 seals the opening 24 in the pressure chamber 8, as illustrated in FIG. 2.

In operation, the diverter valve 30 is usually in the open position illustrated in FIG. 1 to permit fluid from input pipe 6 to flow through the opening 24 in the pressure chamber 8 and through the spout housing 5. The weight of the diverter valve 30 keeps it in a normally open position when there is no water pressure at pipe 6. When it is desired to divert the flow of fluid in input pipe 6 to an overhead shower fixture or other destination, the diverter valve 30 is moved upwardly by raising knob 34 to the position illustrated in FIG. 2 so that the valve disc 32 covers the opening 24 in the pressure chamber. The pressure of the fluid entering the pressure chamber through the input pipe 6 is sufficient to overcome the downward gravitational force on the diverter valve 34 and hold the valve disc 32 against the valve seat 38 formed by the pressure chamber's second member so that the valve disc covers the pressure chamber opening 24. Since there is no outlet for the fluid from the pressure chamber, the fluid is diverted to an overhead shower fixture or other destination. When it is desired to route the fluid through the spout housing 5, the knob 34 is moved downwardly by pushing knob 34 so that the valve 30 assumes the open position illustrated in FIG. 1 and fluid flows through the pressure chamber opening 24 and through the spout housing 5.

Referring now to FIG. 3, the valve disc 32 of the diverter valve 30 is illustrated in its open position in which pressure chamber opening 24 is exposed. As previously indicated, by moving knob 34 vertically upward, the valve disc 32 seats against the valve face 38 and prevents the flow of fluid through the spout housing 5.

The diverter spout 2 is relatively easy to manufacture because the pressure chamber 8 and the spout housing are made separately and assembled later. The spout housing 5, which is essentially the shape of a truncated cone with the end nearest the apex bent over, can be simply cast from a material which is not highly corrosion-resistant, such as zinc or a zinc alloy such as Zamac No. 3. These materials are also less expensive than highly corrosion-resistant materials such as bronze and brass. The spout housing 5 can then be coated with a layer of corrosion-resistant material, such as chromium or Unichrome Vinyl Lacquer 0230.

The pressure chamber's first and second members, 10 and 22 respectively, are separately molded from a plastic such as Marbon Cycloc ABS Grade X-27 or Kralastic 2926. The first and second members are then welded together ultrasonically to form the pressure chamber 8. The pressure chamber is then inserted into the fluid inlet end of the spout housing 5. Although the pressure chamber 8 is formed to snugly fit the spout housing 5, the junction between the outer surface of the pressure chamber and the inner surface of the spout housing may be sealed with an appropriate sealer, such as a nonhardening plastic, to insure that the junction is leaktight. Furthermore, a screw 40 may be inserted into an opening in the spout housing 5 and threaded into the pressure chamber 8 to insure that the pressure chamber is securely retained in the spout housing 5. In comparison to the difficulty in manufacturing and the expense involved in producing the conventional single piece diverter spout in which the spout housing and pressure chamber are integrally cast, the diverter spout of this invention is simpler and more economical to produce.

While there has been described what is at present considered to be a preferred embodiment of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein, without departing from the invention, and it is therefore intended to cover all such changes and modifications as fall within the true spirit and scope of the invention.

I claim:

1. A spout for discharging or diverting fluid comprising:
 - a hollow metal housing having a first end opening, said first end opening being for discharging fluid from said housing;
 - a plastic chamber resistant to effects of hot or cold water adapted to fit within said housing, said chamber having sidewalls and front and rear walls, said rear wall having an opening through which fluid is introduced into said chamber, said front wall having an opening through which fluid is transmitted into said housing; and
 - a valve mechanism including a valve stem and a valve disc; said valve stem extending through an opening in said housing and slidably positioned therein for movement in the vertical direction, said valve disc being attached to said valve stem and positioned in said chamber directly adjacent said front wall opening so that said disc is normally positioned below said front wall opening to permit the flow of fluid therethrough and said disc is

positioned over said front wall opening to prevent the flow of fluid therethrough when said valve stem is moved vertically upward.

2. The spout recited in claim 1 wherein said housing is composed of a zinc alloy.
3. The spout recited in claim 1 further comprising a shoulder extending vertically outwardly from said chamber rear wall which covers said housing.
4. The spout recited in claim 1 wherein the outer surface of said chamber sidewalls snugly engages the inner surface of said housing sidewalls.
5. The spout recited in claim 1 wherein said valve disc is composed of metal.
6. The spout recited in claim 1 wherein said valve disc is weighted to drop from a position covering said front wall opening when fluid pressure is off.
7. The spout recited in claim 1 wherein said chamber is formed from two parts which are sonically welded together.
8. The spout recited in claim 1 wherein the interior of said housing is plastic coated.
9. A fluid diverter spout comprising:
 - a hollow metal housing having first and second end openings, said first end opening being for discharging fluid from said housing, said housing being substantially in the shape of a truncated cone;
 - a plastic chamber resistant to effects of hot or cold water adapted to fit within said housing second end opening, said chamber having sidewalls and front and rear walls, said rear wall having an opening through which fluid is introduced into said chamber, and said front wall having an opening through which fluid is transmitted into said housing, said chamber having a shoulder extending vertically outwardly from said chamber rear wall which covers said housing at said second end opening; and
 - a valve mechanism including a valve stem and a metal valve disc; said valve stem extending through an opening in said housing and slidably positioned therein for movement in vertical direction, said valve disc being attached to said valve stem and positioned in said chamber directly adjacent said front wall opening, said disc being weighted so as to be normally positioned below said front wall opening thereby permitting fluid to flow through said housing and to drop into a normal position below said front wall opening from a position covering said front wall opening when fluid pressure is off.

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