United States Patent

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[54] **LIQUID SOAP MIXER AND DISPENSER FOR SHOWER BATHS AND THE LIKE**
10 Claims, 6 Drawing Figs.

[52] U.S. Cl. **239/310,** 239/317, 239/379
[51] Int. Cl. **B05b 7/26**
[50] Field of Search 239/302, 310, 317, 318, 364, 365, 379, 427, 427.3; 137/602, 604, 625.3, 625.35, 101.11; 25/272.8

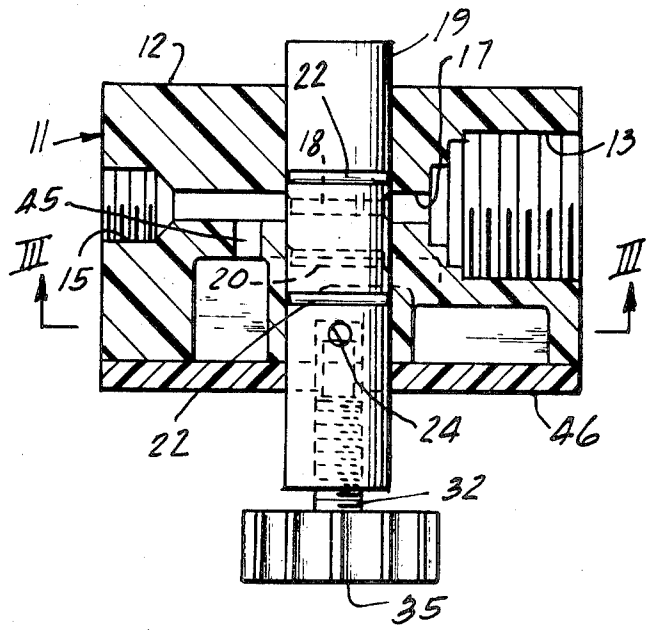
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ABSTRACT: Mixing and dispensing shower head including a valve block having an inlet at one end connected with a supply pipe for clear water and having an axially aligned outlet at the opposite end having a spray shower nozzle extending therefrom. The valve block has a liquid soap container extending upwardly from its top with a passageway leading from the soap container to a soap diluting and mixing chamber within the valve block. A water chamber is also contained within the valve block and is supplied with water by a passageway connected with the inlet, and is connected with the soap-mixing chamber to admit water to dilute the soap in the soap-mixing chamber and effect the mixing of soap and water in the diluting and mixing chamber. A slide valve slidably extends through the valve body transversely of the inlet and outlet and controls the supply of soap to the soap chamber and has one passageway of a relatively large diameter leading diametrically therethrough for supplying clear or rinse water to the shower head, and a second diametral passageway of a smaller diameter providing the pressure drop to educt a mixture of soap and water from the soap-mixing chamber to the outlet of the valve. A metering valve has cooperation with the diametral liquid soap passageway in the slide valve to control the supply of liquid soap to the soap diluting and mixing chamber.



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Fig. 1

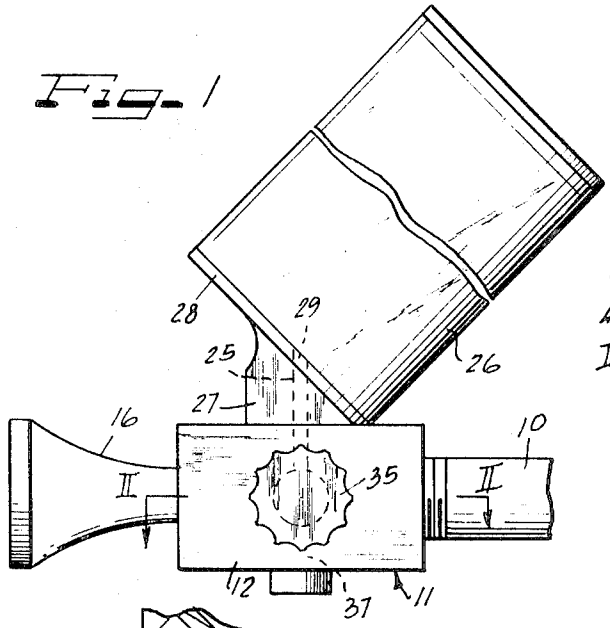


Fig. 2

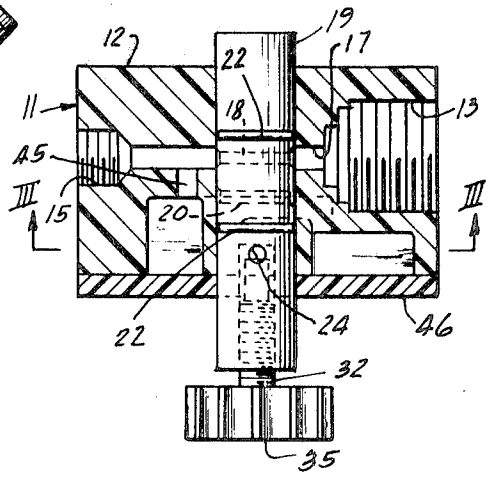


Fig. 3

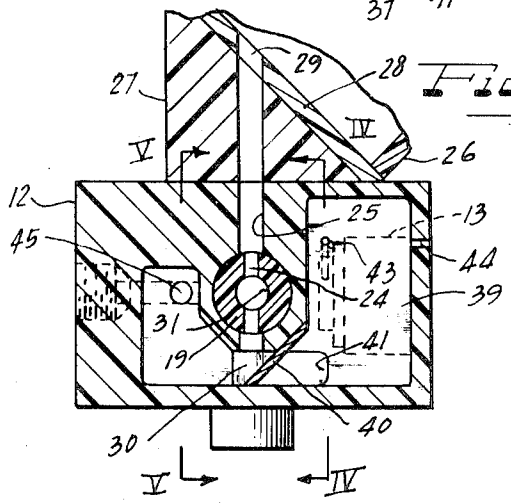


Fig. 4

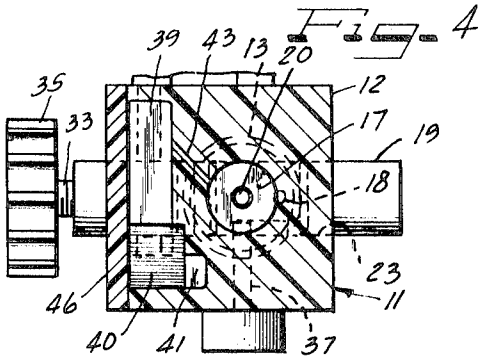


Fig. 5

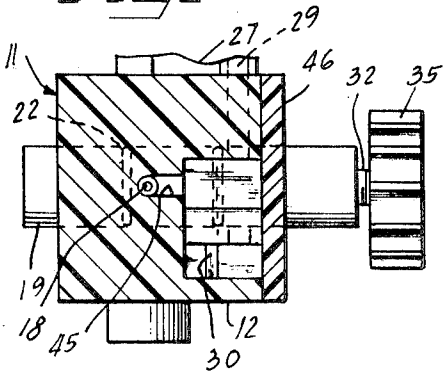
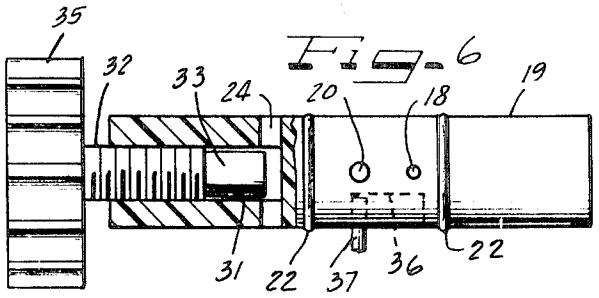


Fig. 6



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LIQUID SOAP MIXER AND DISPENSER FOR SHOWER BATHS AND THE LIKE

BACKGROUND AND OBJECTS OF THE INVENTION

Heretofore mixers have been provided for shower heads which mix liquid soap with water and supply a mixture of soap and water to the spray nozzle of the shower head. Such mixers usually directly aspirate liquid soap by the pressure drop of water passing to the shower head, with the result that the soap container is evacuated in a very short time. This results in an excessive use of soap and wasting of a large proportion of the soap.

The present invention has as its principal object to remedy the foregoing deficiencies and make it practical to mix soap and water and supply a mixture of soap and water to a shower head by providing a soap and water mixing or diluting chamber in which liquid soap is metered to the chamber by gravity and water flows to the chamber with little, if any, pressure, and the mixture of soap and water is drawn into the outlet passageway of the valve body for further mixing with water and spraying through the spray shower nozzle of the shower head.

A further object of the present invention, therefore, is to provide a simplified and efficient form of shower head, so arranged as to utilize a liquid soap, and supply a preselected economical mixture of liquid soap and water, to be educted to the spray shower nozzle of the shower head.

Another object of the invention is to provide an efficient and economical form of soap mixing and dispensing shower head, mixing liquid soap and water by gravity, and selectively operable to enable the bather to select a mixture of soap and water for washing, or clear water for rinsing.

Still another object of the invention is to provide a soap mixer and dispenser forming an attachment for a shower head, in which liquid soap passes by gravity into a mixing chamber, clear water is mixed with the liquid soap under little, if any, pressure and a mixture of liquid soap and clear water is educted through the shower head to be further diluted by water passing through the shower head.

A still further object of the invention is to provide a soap mixing and dispensing shower head selectively operable to dispense soapy or clear water, and arranged with a view toward utmost simplicity in construction and economical use of liquid soap.

Other objects, features and advantages of the invention will be readily apparent from the following description of a preferred embodiment thereof, taken in conjunction with the accompanying drawings, although variations and modifications may be effected without departing from the spirit and scope of the novel concepts of the disclosure.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in side elevation of a shower head constructed in accordance with the principles of the present invention.

FIG. 2 is a fragmentary horizontal sectional view taken substantially along lines II—II of FIG. 1, with the selector valve shown in full.

FIG. 3 is a sectional view taken substantially along line III—III of FIG. 2.

FIG. 4 is a transverse sectional view taken substantially along line IV—IV of FIG. 3.

FIG. 5 is a transverse sectional view taken substantially along line V—V of FIG. 3; and

FIG. 6 is a view in side elevation of the selector valve with certain parts broken away and certain other parts in section, in order to illustrate the metering valve, metering a supply of liquid soap to the soap-mixing chamber.

DESCRIPTION OF A PREFERRED EMBODIMENT OF INVENTION

In FIG. 1 of the drawings, I have shown an outlet pipe 10 for a shower head 11, which may be connected with a supply of water for the shower through a conventional universal coupling (not shown). The soap mixing and dispensing shower head 11 includes a valve block 12 having an inlet 13 (FIG. 2) threaded to have the inlet 10 threaded therein, and an axially aligned outlet 15 having a conventional shower nozzle 16 threaded therein. A passageway 17 axially aligned with the inlet 13 and outlet 15 extends longitudinally through the valve body and connects the inlet to the outlet through a reduced diameter passageway 18 leading diametrically through a selector valve, shown as being a generally cylindrical slide valve 19.

The slide valve 19 is generally cylindrical in form. A large diameter passageway 20 is spaced from passageway 18 and is parallel to and in horizontal alignment therewith and leads diametrically through said slide valve and registers with the passageway 17 to supply clear rinse water through the spray shower nozzle. Suitable sealing means, such as O-rings 22, 22 are provided on opposite sides of the passageways 18 and 20 and have sealing engagement with the interior wall of a cylindrical valve chamber 23 extending transversely of the passageway 17. The slide valve 19 also has a liquid soap passageway 24 spaced outwardly of the passageways 18 and 20 on the outside of the O-rings 22 and leading diametrically through said valve, perpendicular to the passageways 18 and 20. The liquid soap passageway 24 is movable into position to register with a liquid soap passageway 25, leading downwardly of a soap container 26 along a bracket 27 for said soap container, for supplying liquid soap to the liquid soap passageway 24, by gravity.

The soap container 26 is disposed at an angle with respect to the top of the valve block 12 so that when the shower head 11 is in a normal downwardly tilted position, a bottom 28 of the soap container will be generally horizontal. The liquid soap in said soap container may thus drain through a port 29 in the bottom 28, through the passageway 25, passageway 24 in the slide valve 19 to a soap diluting and mixing chamber 30, herein shown as being positioned along the bottom and at one side of a valve block, but which may be positioned to extend along the bottom of the valve block, or in any suitable position where soap in the soap container 26 will drain to the soap-mixing chamber 30 by gravity.

The slide valve 19 has a hollow interior portion 31, extending axially along said valve, from one end thereof into the soap passageway 24. A metering pin 32 is threaded for a portion of its length and has a reduced diameter valve pin 33 extending inwardly of the threaded portion of said metering pin. Said metering pin is threaded in the passageway or interior portion 31 of the slide valve 19 in registry with the passageway 24 and cooperates with said passageway 24 to regulate the amount of soap dropping by gravity into the soap diluting or mixing chamber 30. A knob 35 on the outer end of said metering pin is provided to move said metering valve axially, to control the flow of soap into the soap-mixing chamber 30.

The slide valve 19 has a slot 36 extending axially therealong between the O-rings 22. The slot 36 is engaged by a stop pin 37 having a head on the outer end thereof and extending inwardly along the valve block from the bottom thereof into the valve chamber 23 and slot 36. The slot 36 and stop pin 37 register the passageways 18 or 20 into position to register with the passageway 17 leading from the inlet 13 to the outlet 15, and also stop the valve body, with the passageway 24 in registry with the liquid soap passageway 25 when the reduced diameter passageway 18 is in registry with the passageway 17, in the soap-dispensing position of the valve. The pin 37 and slot 36 also register the passageway 20 with the water passageway 17, as the valve is positioned to supply rinse water through the shower head.

A water chamber 39 is provided in the valve body 12 toward and to one side of the inlet 13 into said valve body and is separated from the soap-mixing chamber 30 by a baffle 40. A passageway 41 in the bottom of the valve body leads around the baffle 40 and affords communication to the soap-mixing chamber 30, for supplying water to be mixed with liquid soap metered under gravity under the control of the metering valve

33. The water chamber 39 is supplied with water from the inlet 13 through a relatively small diameter passageway 43 leading from the inlet 13 into the water chamber 39, through an interior wall thereof. An air bleed opening 44 leads into the water chamber 39 to the backwall thereof, to supply air to said chamber and accommodate the water to flow freely through the passageway 41 into the soap diluting and mixing chamber 30.

The soap diluting and mixing chamber 30 has communication with the passageway 17 on the downstream side of the slide valve 19 through a passageway 45. The pressure drop of water flowing through the reduced diameter passageway 18, will thus supply the pressure to aspirate a solution of soap and water from the soap-mixing chamber 30, and supply a mixture of soap and water through the shower nozzle 16.

As shown in FIGS. 2,4 and 5, the chamber 30 and the water chamber 39 are closed by a side closure plate 46. When the passageway 18 in the slide valve 19 is in registry with the passageway 17 leading through the valve block from the inlet to the outlet, the passageway 24 in the slide valve will be in registry with the port 29 and passageway 25 leading downwardly along the valve block, to accommodate liquid soap to flow by gravity into the soap-mixing chamber 30. Water in the water chamber 39 will also flow into the soap-mixing chamber 30 through the passageway 41 to dilute the soap to the required consistency, and the head of soap and water will maintain the diluted soap solution at a level to flow through the passageway 45 into the passageway 17 and mix with clear water entering the valve body through the inlet 13. The pressure drop of fluid passing through the reduced diameter passageway 18 will further educt or aspirate the soap solution along the passageway 45 and effect the discharge of soapy water through the shower spray nozzle 16.

The valve block 12, slide valve 19 and spray nozzle 16 may be made from a plastic material, which preferably may be a form of transparent plastic, such as a transparent nylon plastic. It should be understood, however, that the shower head need not be made from a transparent plastic but may be made from any other suitable plastic material, and may be made from metal, if desired.

I claim as my invention:

1. In a diluter and dispenser for liquid soap and the like, and in combination with a shower bath having a spray shower nozzle,

a valve block adapted to be connected with a water supply pipe and having a first passageway leading therethrough adapted to supply water to a shower spray nozzle,

a container for liquid soap extending from the top of said valve block and having a port leading from the bottom thereof and having communication with the interior of said valve block,

a soap diluting and mixing chamber in said valve block,

a valve extending transversely of said valve block and movable into one position to afford communication between said soap container and soap diluting and mixing chamber and into another position to block the supply of soap in said container to said mixing chamber,

a water chamber in said valve block, a passageway leading from said first passageway into said water chamber, for supplying water thereto,

a communicating passageway between said water chamber and said soap diluting and mixing chamber,

and a passageway from said soap diluting and mixing chamber to said first passageway downstream of said valve, for supplying a mixture of soapy water to said first passageway to be ejected by the flow of water through said first passageway to and through the spray shower nozzle of said shower head.

2. The liquid soap dispenser and mixer of claim 1,

wherein the valve is movable into a first position to supply liquid soap to said diluting and mixing chamber and to accommodate water flowing through said first passageway to draw a soap solution from said mixing chamber for discharge through said spray shower nozzle, and is movable to a second position to shut off the supply of liquid soap to said mixing chamber and accommodate the flow of clear water through said first passageway and shower spray nozzle.

3. The liquid soap dispenser and mixer of claim 1,

wherein the valve is a slide valve movable along said valve chamber in an axial direction and has two passageways of different diameters leading diametrically therethrough, and a third passageway spaced from said two passageways and perpendicular thereto, and accommodating the supply of soap to said soap-mixing chamber under gravity, and

wherein the valve is slidable into a first position to register the small diameter passageway with said first passageway and the perpendicular diametral passageway with said soap container and soap diluting and mixing chamber, and into a second position to shut off the supply of soap from said container and register said large diameter passageway with said first passageway to supply clear rinse water through the spray shower nozzle.

4. The liquid soap mixer and dispenser of claim 3,

wherein the slide valve is movable along a cylindrical valve chamber intersecting said first passageway and is sealed to said valve chamber on opposite sides of said first passageway and on the outer sides of said diametral passageways, and

wherein stop means is provided to register a selected of said passageways with said first passageway and to limit the positioning of the valve into said first and second positions.

5. The soap mixer and dispenser of claim 3,

wherein a metering valve extends along said slide valve, to meter the flow of fluid through said diametral passageway perpendicular to said two parallel diametral passageways extending through said slide valve.

6. The soap mixer and dispenser of claim 2,

wherein the metering valve is in the form of a metering pin extending along said slide valve from one end thereof and movable into position to restrict the flow through said perpendicular passageway.

7. The soap mixer and dispenser of claim 1,

wherein an air bleed passageway leads from the exterior of said valve body into said water chamber and a water passageway leads from said inlet to said water chamber, and

wherein a passageway leads from said soap-mixing chamber to said first passageway, downstream of said slide valve to effect the drawing of a mixture of soap and water from said soap diluting and mixing chamber by the pressure drop of water passing through said small diameter passageway to said first passageway.

8. The soap mixer and dispenser of claim 3,

wherein an air bleed passageway leads through said valve body into said water chamber, and the mixture of soap and water in said diluting and mixing chamber is maintained at a level to flow through said water and diluting and mixing chamber.

9. The soap mixer and dispenser of claim 8, including a metering valve in said slide valve selectively operable to meter the flow of liquid soap through said diametral passageway through said valve and perpendicular to said parallel passageways of different diameters.

10. The soap mixer and dispenser of claim 9, wherein the metering valve includes a metering chamber extending axially along said slide valve and opening to one end thereof, and

a metering pin threaded in said metering chamber and having a metering valve end having metering cooperation with said soap passageway.