

[54] **DEVICE FOR SELECTIVELY DISPENSING LIQUIDS**

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[58] Field of Search..... **239/303, 304, 305, 310, 317, 239/318; 222/132, 135, 387, 559, 560, 561, 510, 511, 518; 251/319, 320, 321**

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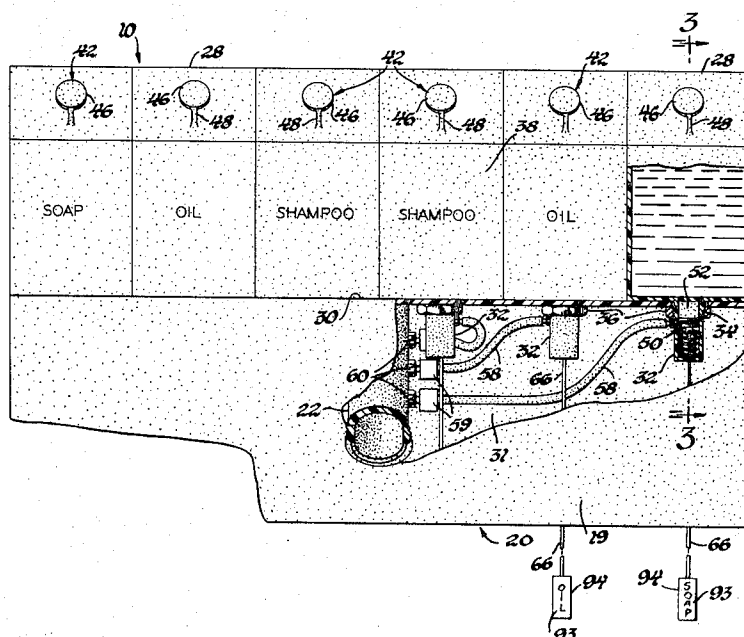
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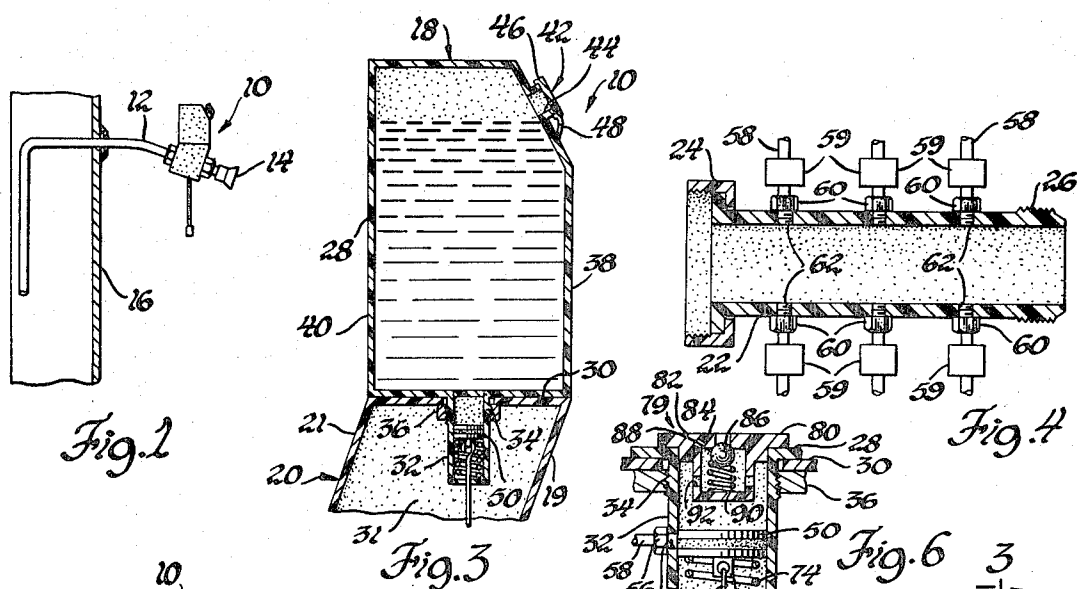
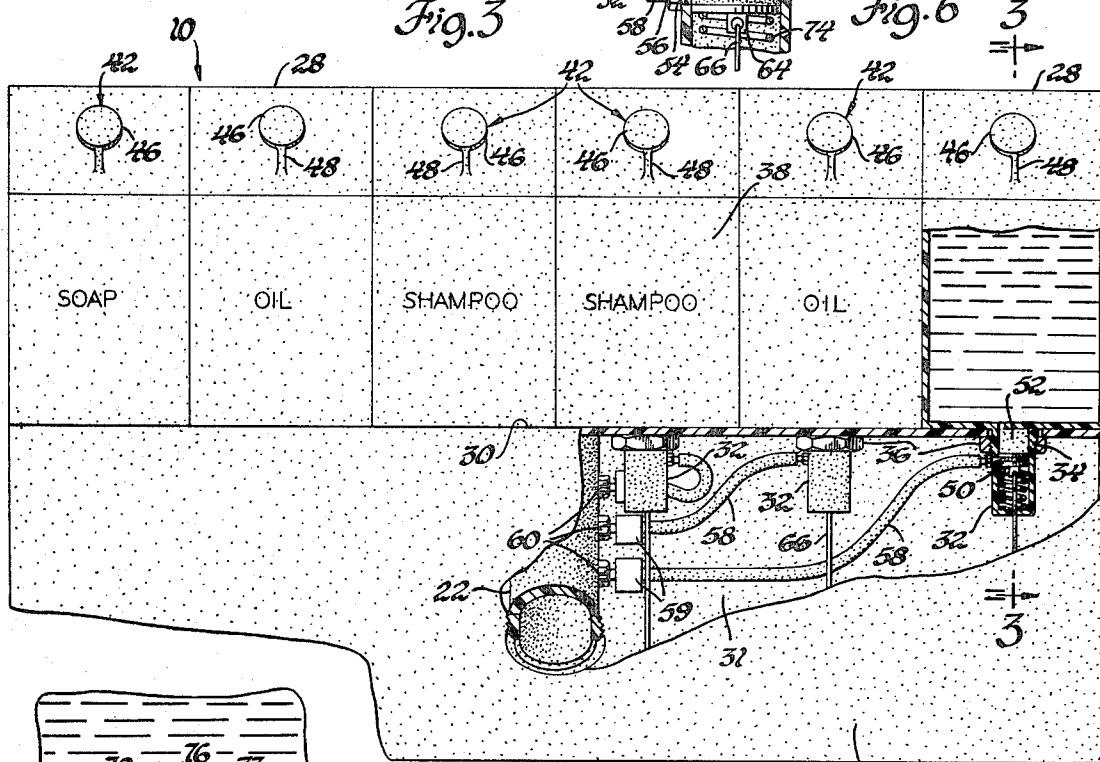
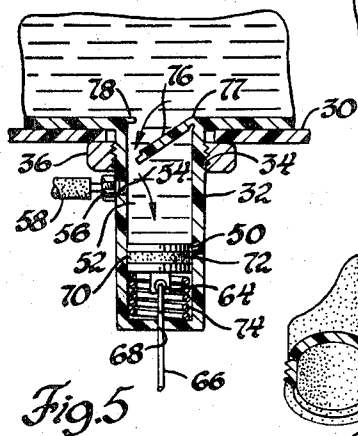
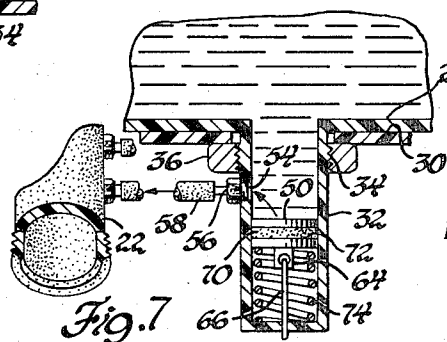
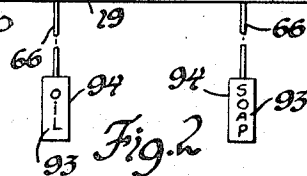
[57] **ABSTRACT**

A device adapted to be operated in conjunction with a shower fixture for selectively dispensing one or a plurality of liquids into the water stream discharged by the shower nozzle. The device has a plurality of containers, each adapted to store a quantity of liquid, such as, but not limited to, a perfume, a soap, a detergent, a deodorant, an antiseptic, or other chemical substances desired by the user of the shower. Each container has a valve which is manually operated by the user to selectively dispense a predetermined amount of one or more of the liquids from their associated containers to the water stream. The containers are preferably constructed of a transparent material, such as transparent plastic, to permit the user of the shower to visually determine the amount of the liquid remaining within each container.

In one example of the invention, an even number of containers are mounted on a support member which, in turn, is carried by the shower fixture. Each of half of the containers is filled with a different liquid, such as for example, soap, oil and a perfume, while each of the remaining half of the containers duplicates the contents of each of the first containers, so that the user may, by manually operating one of the valves, dispense a defined amount of the desired liquid into the water stream and, if the user desires to double that quantity, the valve of the second container containing the same liquid may be simultaneously operated to dispense twice the quantity of the liquid.

11 Claims, 7 Drawing Figures





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DEVICE FOR SELECTIVELY DISPENSING LIQUIDS

BACKGROUND OF THE INVENTION

I. Field of the Invention

The present invention relates to a device for dispensing fluids, and particularly the present invention relates to a device for selectively dispensing a plurality of liquids into the water flowing in the supply line of a shower fixture.

II. Description of the Prior Art

Heretofore, a variety of devices and methods have been employed for providing a means for selectively delivering water, a mixture of water and liquid soap, or other selected liquids with water through the discharge nozzle of a shower bath spray or similar fixture. One such prior device has incorporated a means for placing a tubular pellet or the like in the path of the water flow, such that the materials within the tubular pellet are dissolved by the water and carried away in the flow of the water to the user of the shower. Other prior devices dispense selected liquids into the water stream with the selected liquids stored in individual capsules which are controllably brought into position and pierced by suitable controllable means to permit the entire contents of the capsule to be drawn into the flow of water and mixed therewith as desired by the user. Still other prior devices have been employed which have a container surrounding the shower head for storing a single liquid, such as a liquid soap, which may be intermixed with the in-flowing water as desired by the user.

Although the prior art devices have functioned in an acceptable manner, they have a number of disadvantages. The most notable disadvantage of certain of the prior art devices is that they do not use commercially available products, that is, the prior art devices generally require a special pellet or capsule which is not readily available, thus hampering the user's ability to obtain the desired liquids from any desired source at a competitive price. In addition, none of the prior art devices have means which permit the user to selectively vary the amount and type of liquid he desired to mix with the in-flow of water. In those devices that do permit a variation in the type of liquid available, the user has a limited choice in determining the quantity of liquid to be mixed with the water supply.

It would be desirable to provide a device of the type described which eliminates the aforementioned difficulties of the prior devices, yet which is simple in its construction, inexpensive in its manufacture, easy to operate, and which requires virtually no maintenance.

SUMMARY OF THE INVENTION

The present invention consists of a device for selectively dispensing one or a plurality of liquids into a water stream including a plurality of separate containers or compartments, each of which has valving means adapted to selectively dispense a predetermined amount of the liquid contained in its associated container or compartment to the water stream.

It is therefore an object of the present invention to provide a device which will deliver at a controlled rate a selected liquid into a water stream without interfering with the flow of water.

It is also an object of the present invention to provide a device adapted to selectively dispense any one of a

plurality of liquids to a water stream which is simply constructed, inexpensive, and easy to operate.

Further objects, advantages, and applications of the present invention will become apparent to those skilled in the art of such devices when the description of one example of the present invention is read in conjunction with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

The description herein makes reference to the accompanying drawing wherein like reference numerals refer to like parts throughout the several views, and in which:

FIG. 1 is a view illustrating an adaptation of an example of the dispensing device of the present invention to a shower fixture;

FIG. 2 is a partial front elevation view thereof, with portions shown in section to show the internal construction;

FIG. 3 is a transverse sectional view thereof taken along line 3—3 of FIG. 2;

FIG. 4 is a fragmentary longitudinal sectional view of the water supply line illustrated in FIG. 2;

FIG. 5 is a fragmentary sectional view of the valving mechanism used to selectively dispense the liquids stored within the dispensing device to the water supply stream;

FIG. 6 illustrates a modification of the valving mechanism shown in FIGS. 2 and 5; and

FIG. 7 illustrates another modification of the valving mechanism shown in FIGS. 2 and 5.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing and particularly to FIG. 1, a structural example of the invention is illustrated in the form of an attachment for shower fixtures and is shown as comprising a dispensing device 10 adapted to be carried by a water pipe 12 intermediate a shower head 14 mounted on the end of the water pipe 12, and a wall 16 through which the water pipe extends. The water pipe 12, in turn, is connected through suitable valving (not shown) to the cold and hot water supply lines in the conventional manner. The dispensing device 10 comprises a housing 18 mounted to a support member 20 which, in turn, has a centrally disposed coupling pipe 22 extending from the front wall 19 to the rear wall 21 of the support member 20. The coupling pipe 22 (FIG. 4) is provided with an appropriate conventional pipe fitting 24 extending through the rear wall 21 of the support member 20 which permits a connection to the outlet of the water pipe 12 and an appropriate conventional fitting 26 extending through the front wall 19 of the support member 20 which permits a connection to the shower head 14, providing a continuous water flow path from the water pipe 12 to the shower head 14 through the support member 20. The coupling pipe 22 may be integrally formed with the support member 20 or attached to the front and rear walls by a suitable adhesive, or by welding or soldering in construction where the pipe and the support member are made of metal. The coupling pipe 22, the housing 18 and the support member 20 are however preferably constructed of a plastic material of sufficient strength so as to support the various liquids to be carried within the

dispensing device 10, as well as to resist torsional moments exerted thereon by individual operation of each valve, as will be explained hereinafter, or, alternately, the dispensing device 10 may be attached to the wall 16 by appropriate brackets, not shown.

The housing 18 is illustrated as comprising a plurality of separate containers 28 arranged in a side-by-side fashion and individually attached to the upper wall 30 of the support member 20. However, it should be noted that the housing 18 may be an integral unit having a plurality of internal partitions to form the containers 28, which would eliminate the necessity of the individual mounting of each container 28. As can best be seen in FIGS. 2, 3 and 5, each container 28 has an integrally formed, centrally disposed tubular member 32 extending downwardly through the support member upper wall 30 and into the interior 31 of the support member 20. The upper outer periphery of each tubular member 32 has a threaded outer surface 34 accommodating at nut 36 which, when threaded upwardly into abutment with the inner side of the upper wall 30 of the support member 20, brings the bottom of its associated container 28 into a compressive abutment with the top of the upper wall 30 to securely retain the container to the support member 20.

It should be noted that the front wall 19 and the rear wall 21 of the support member 20 are respectively inclined with respect to the front wall 38 and rear wall 40 of the container 28, which are normally disposed in vertical planes. The dispensing device 10 is constructed in this manner to permit the coupling pipe 22 to pass perpendicularly through the front and rear walls of the support member 20 and to accommodate an easy mounting of the coupling pipe 22 to the water pipe 12 which normally is at an angle with respect to the horizontal, while at the same time permitting the front and rear walls of each container 28 to be disposed in a vertical plane, resulting in a more attractive frontal appearance of the dispensing device 10.

Each container 28 is provided with a fill opening 42 (FIGS. 2 and 3) in the form of a flanged aperture 44 on which a plastic cap 46 is snapped on and off when it is necessary to fill the containers 28 with the desired liquid. Each cap 46 is illustrated as having an elongated strip 48 which integrally connects each cap 46 to the housing 18 such that the caps will not be separated and lost from their associated container apertures 44.

The interior of the tubular member 32 associated with each of the containers 28 has a piston 50 slidably mounted therein defining in the interior of the tubular member a chamber 52 above the upper wall of the piston 50 and into which a predetermined quantity of liquid may be drawn from the associated container, as will be explained hereinafter. A threaded, radially extending bore or port 54 (FIG. 5) formed in the wall of the tubular member 32 accommodates a fitting 56 on which an end of a connecting hose 58 is attached. Each of the connecting hoses 58 of the tubular members 32 is, in turn, connected at its other end to a one-way valve 59 and to the coupling pipe 22 by fittings 60 (FIGS. 2 and 4) threaded into bores 62 extending radially through the wall of the coupling pipe 22, such that the liquid introduced within each chamber 52 may be selectively forced under pressure through the one-way valve 59 and into the coupling pipe 22 where the liquid

is mixed or dissolved, with the water flowing through the coupling pipe 22. Both the water and the selected liquid or liquids are carried through the shower head 14 to the user. The one-way valve 59 may be any conventional one-way or check valve, such as a ball or flap valve or the like, which will permit the liquid to flow freely in one direction and which prevents the liquid from flowing in the opposite direction. In the present example, liquid is permitted to flow from the chamber 52 to the coupling pipe 22, but not in the opposite direction.

The piston 50 has a flange 64 (FIG. 5) on the side opposite the pressure chamber 52, through which a cable or rod 66 is attached. The cable or rod 66 extends downwardly through a small aperture 68 in the closed end portion of the tubular member 32, through the bottom wall of the support member, and externally thereof. An O-ring seal 70, carried in a groove 72 in the peripheral surface of the piston 50, or any other conventional sealing means, prevents passage of the liquid from the chamber 52 into the lower portion of the tubular member 32. A coil spring 74, disposed in the lower portion of the tubular member 32, biases the piston 50 to the piston shown in FIGS. 2 and 3, where it normally closes off the port 54.

As can best be seen in FIG. 5, a disc-shaped valve member 76 is pivotally attached at the upper extremity of the tubular member 32 at pivot point 77 and is adapted to close and open communication between the chamber 52 and the interior of its associated container 28. A lip portion 78, integrally formed at the upper extremity of the tubular member opposite the pivot point 77, prevents the disc-shaped valve member 76 from passing beyond a horizontal position and upwardly into the interior of its associated container 28. The valve member 76 is so constructed as to be normally biased into engagement with the lip portion 78 to close fluid communication between the interior of its associated container and the chamber 52 with the biasing force being very small, such that the slightest pressure differential between the interior of the container 28 and the chamber 52 will move the valve member 76 to the open position shown in FIG. 5.

When the user of the dispensing device desires to inject a selected amount of one of the liquids contained in one of the several containers, the user grasps a handle 94 carried at the lower end of the cable or rod 66 and pulls downwardly thereon. The piston 50 moves to expand the chamber 52, causing a pressure differential between the interior of the container 28 and the chamber 52, opening the valve member 76 and permitting the passage of the liquid into the chamber 52. When the user releases the handle 94, the spring 74 forces the piston 50 upwardly, simultaneously closing the valve member 76 and forcing the liquid within the chamber 52 through the hose 58, the one-way valve 59, and into the coupling pipe 22, where the liquid is mixed with the water stream and carried to the user. When the piston 50 reaches its normal position, as shown in FIG. 2, communication between the chamber 52 and the coupling pipe 22 is closed. Thus, a predetermined amount of the desired liquid is communicated to the coupling pipe 22 and thus to the user.

In FIG. 6 a modification of the disc-shaped valve 76 is illustrated in the form of a ball check valve 79 which

comprises a cup-shaped retainer 80 having an upper annularly shaped lip 82 which abuts the bottom portion of the container 28 to prevent the modified valve member from dropping into the chamber 52. The lip 82 is attached to the bottom of the container by any suitable means, such as an adhesive. The retainer 80 has an inner annularly shaped lip 84 which defines a valve seat 86 that cooperates with a ball member 88. The ball member 88 is biased to a closed position, that is, into engagement with the valve seat 86 by a spring 90 which is, in turn, supported by the bottom of the retainer 80. The cup-shaped retainer 80 has a plurality of angularly-spaced, radially extending bores 92, which permit communication between the chamber 52 and the interior of the retainer. When the user of the device pulls downwardly on one of the cables or rods 66 to inject a desired amount of the liquid into the coupling pipe 22, the piston 50 is moved against the bias of the spring 74, creating a slight pressure differential across the ball member 88, forcing the ball member 88 to unseat to permit the liquid to flow into the chamber 52. Upon release of the cable 66, the piston 50 is moved upwardly under the bias of the spring 74 towards its initial closed position. As the piston moves upwardly, the ball member 88 closes off communication between the container 28 and the chamber 52, and fluid within the chamber 52 is forced through the hose 58 and the one-way valve 59 into the coupling pipe 22 in the same manner as hereinbefore described.

As can be seen in FIG. 2, each of the containers 28 and its associated handle 94 is marked with an indicia 93 to indicate its contents, such as soap, oil, shampoo and the like.

In FIG. 7 a modification of the dispensing device 10 is shown wherein the disc-shaped valve member 76 and the one-way valve 59 are omitted. In this example of the invention, the piston 50, which functions as a spool valve, cooperates with the port 54 in the base of the tubular member 32 to control the amount of liquid flow between the container 28 and the coupling pipe 22. The spring 74 normally biases the piston 50 to a position wherein the port 54 is closed and liquid communication between the container 28 and the coupling pipe 22 is prevented. In the embodiment illustrated in FIG. 7, when the user of the device desires to inject any one of the liquids contained within the several containers 28 into the water stream flowing through the coupling pipe 22, the user simply grasps the handle 94 at the lower end of the cable or rod 66 and pulls downwardly thereon. As soon as the piston 50 clears the port 54, the liquid within the selected container 28, under the combined force of gravity and the suction effect of the water stream flowing through the coupling pipe 22, will flow freely through the port 54 into the coupling pipe 22 to be mixed with the water stream flowing therethrough. By designing the tubular member 32 to control the range of movement of the piston 50 with respect to the port 54, the rate of flow of the liquid therethrough may be predetermined in a selected manner.

It can thus be seen that a new and novel dispensing device has been provided which is simple in its construction, inexpensive to manufacture, and simple in its operation.

"While only the one form of the invention has been disclosed, it is apparent to those skilled in the art that other forms may be adapted, all coming within the spirit of the invention and the scope of the appended claims."

What is claimed is as follows:

1. A device for selectively dispensing a plurality of additive liquids into a main liquid supply line, said device comprising a housing separated into a plurality of compartments, each of said compartments being adapted to store one of said liquids and having liquid conducting means associated therewith for supplying the liquid stored therewithin to said main liquid supply line; and independently operative valve means for each of said compartments for controllably establishing a communication between said compartment and said main liquid supply line, said valve means comprising a tubular member having a piston slidably mounted therein for forming a chamber communicating with said compartment, a port extending through the wall of said tubular member, said port connecting said liquid conducting means to said chamber, means biasing said piston to a position closing said port to prevent communication between said chamber and said liquid conducting means, and control means for slidably displacing said piston to a position opening said port and placing said chamber in communication with said liquid conducting means, said control means comprising a rod attached to one side of said piston and projecting beyond an end of said tubular member for manually pulling said piston to said second mentioned position, said valve means further comprising one-way valve means disposed between said chamber and said compartment for normally permitting communication between the interior of said compartment and said chamber and preventing return flow from said chamber to said compartment, such that said piston displaces liquid from the interior of said compartment into said chamber when the volume of said chamber is increased by movement of said piston and said piston displaces liquid from said chamber into said liquid conducting means to said main liquid supply line when said piston is moved by said biasing means to decrease the volume of said chamber, and second one-way valve means associated with said liquid conducting means for preventing a reverse flow from said main liquid supply line to said chamber.

2. The device defined in claim 1 wherein each of said compartments is a separate container, said tubular member being disposed at the bottom of its associated container, and further comprising a support member mounting a plurality of said containers in a side-by-side fashion, said support member having a plurality of bores through each of which each of said tubular members extends, each of said tubular members having a threaded outer portion receiving a locking nut for secure fastening to said support member.

3. A device for selectively dispensing a plurality of additive liquids into a main liquid supply line, said device comprising a housing separated into a plurality of compartments, each of said compartment being adapted to store one of said liquids and having a liquid conducting means associated therewith for supplying the additive liquid stored therewithin to said main liquid supply line; and independently operative valve

means for each of said compartments for controllably establishing a communication between said compartment and said main liquid supply line, wherein said valve means comprises a tubular member having a piston slidably mounted therein for forming a chamber on one side of said piston, said tubular member having second valve means disposed between said chamber and its associated compartment, said second valve means normally preventing communication between the interior of its associated compartment and said chamber, said liquid conducting means being in communication with said chamber, said piston displacing liquid from the interior of said associated compartment and into said chamber when the volume of said chamber is increased by movement of said piston, said piston displacing liquid from said chamber into said liquid conducting means to said main liquid supply line when said piston is moved to decrease the volume of said chamber, means normally biasing said piston to close communication between said chamber and said liquid conducting means, and third valve means associated with said liquid conducting means for preventing a reverse flow from said main liquid supply line to said chamber.

4. The device defined in claim 3 further comprising means mounting said housing on said main liquid supply line.

5. The device defined in claim 3 wherein each of said compartments is a separate container, and further comprising support means mounting said separate containers in a side-by-side fashion, said support means being carried by said main liquid supply line.

6. The device defined in claim 5 wherein said valve means is adapted to mount its associated container to said support means.

7. The device defined in claim 3 further comprising support means for mounting said compartments in a side-by-side fashion, said valve means engaging said housing to mount said housing to said support means.

8. The device defined in claim 1 wherein each of said compartments is a separate container, said tubular member being disposed at the bottom of its associated container, and further comprising a support member mounting a plurality of said containers in a side-by-side fashion, said support member having a plurality of bores through each of which each of said tubular members extends, each of said tubular members having a threaded outer portion receiving a locking nut for secure fastening to said support member.

9. The device defined in claim 3 wherein the main liquid supply line is a water pipe adapted to be used in a shower bath, said pipe normally extending from a wall and having a shower fixture carried at its extended end, said device being mounted upon said water pipe between said wall and said shower fixture.

10. The device defined in claim 9 wherein said compartments are a plurality of separate containers, and further comprising support means mounting said separate containers in a side-by-side fashion.

11. The device defined in claim 10 wherein each of said containers has an opening and a cap member adapted to cooperate with said opening to permit the user to refill said containers with selected liquids.

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