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SOLUTION MAKING AND DISPENSING APPARATUS

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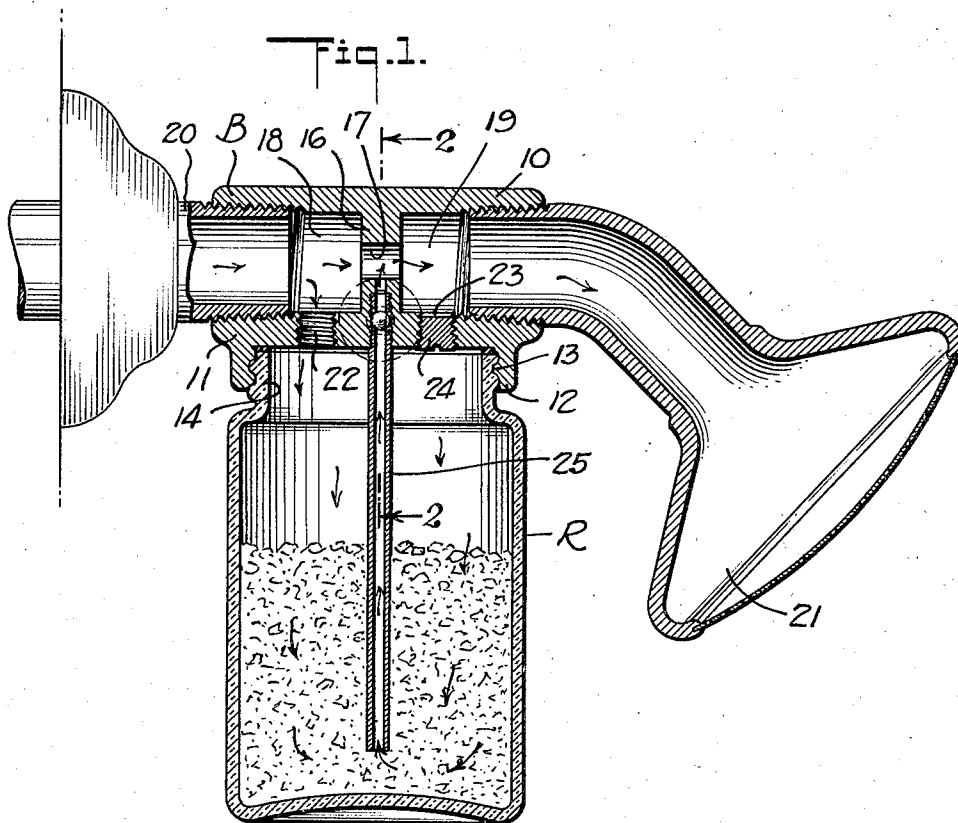


Fig. 2.

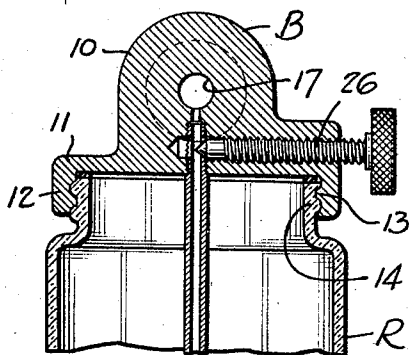
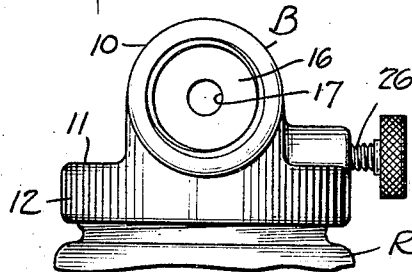


Fig. 3.



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SOLUTION MAKING AND DISPENSING
APPARATUS

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5 Claims. (Cl. 299—84)

This invention relates generally to the art of dissolving solids and dispensing the resulting solution in order to utilize germicidal, disinfecting, perfumed or otherwise scented effects of the solution upon the body in accordance with the property of the particular solid in solution.

The primary object of this invention is to provide a device which is particularly adapted, although not necessarily, for interposition in a water supply line at a plumbing fixture such as a shower head, and which is structurally characterized and functionally related to the water supply line in a manner to continuously produce and dispense from the shower head, a solution of a definite strength, all under the direct control of the user.

Another object of this invention is to provide a device of the above described character which is extremely compact; is simple in construction; inexpensive to manufacture; absolutely dependable in operation; easily regulated to vary the solution strength as well as capable of being rendered inactive should untreated water be desired at the shower head; and which can be installed readily at a shower head or other fixture without necessitating alterations in the plumbing.

With these and other objects in view, the invention consists in the combinations, arrangements and functional relationships of elements as set forth in the following specification and particularly pointed out in the appended claims.

In the accompanying drawing

Figure 1 is a view showing in vertical central section, one form of solution making and dispensing device embodying this invention, installed in a water line at a conventional shower head;

Figure 2 is a vertical transverse sectional view taken on the line 2—2 of Figure 1, and looking in the direction of the arrows;

Figure 3 is a fragmentary view of the device in end elevation.

Referring specifically to the drawing, the invention in its present embodiment comprises an integral body B preferably of cast metal formed to provide a rectilinear pipe coupling portion 10 diametrically disposed to and laterally offset from a receptacle cover portion 11, the annular flange 12 of which is internally threaded at 13 to threadedly receive the externally threaded neck 14 of an open topped receptacle R, such as a glass jar adapted to contain a supply of the solid to be used in producing the solution.

Medially between its ends the bore of the coupling portion 10 is provided with a transverse

partition 16 having an axially disposed port 17 therethrough, and dividing the coupling portion interiorly into inlet and outlet chambers 18 and 19, respectively. The ends of the coupling portion are internally threaded for connection, respectively, to a water supply line 20 and to a conventional shower head 21 or other fixture as desired, so as to interpose the body B between the water line and shower head with the receptacle vertically disposed and depending from the body, as shown in the drawing.

At opposite sides of the partition 16, the cover portion 11 of the body B is provided with by-pass ports 22 and 23 of a diameter corresponding approximately to that of the port 17. These ports place the respective chambers 18 and 19 in communication with the interior of the receptacle R; and it is to be noted that the ports are threaded to selectively receive a plug 24 which normally closes that one of the ports correlated with the discharge chamber 19, all for a purpose to be hereinafter more fully described.

Threaded into or otherwise supported from the body B is a solution tube 25 which is axially disposed relative to the cover portion 11 of the body so as to depend therefrom axially into the receptacle R and to communicate therewith at a point adjacent the bottom thereof. The upper end of the tube opens into the port 17, and the flow of solution through the tube from the receptacle to the port 17 is controlled by a regulating needle valve 26, the shank of which is threaded into the body B from one side thereof as shown in Figures 2 and 3, and can be manually adjusted to vary the liquid flow, as well as to close off the flow entirely should it be desired to dispense untreated water from the shower head.

It is to be noted that in view of the disposition of the valve 26 for manipulation from one side of the body B, and the fact that the coupling portion 10 is symmetrical with respect to the partition 16, the device can be installed to connect either end of the coupling portion 10 with the water supply pipe, depending on which side of the body B is more accessible to the user for manipulation of the valve 26. The provision of the two ports 22 and 23 and the single plug 24 enables one port or the other to be closed in accordance with the disposition of the body, so that that port correlated with the chamber at the end of the body connected to the supply pipe will remain open.

The operation of the invention is as follows:

Let it be assumed that the receptacle R is supplied with a quantity of the water soluble solid in granular or tablet form. Various salts, such as

Epsom, common and scented salts, medicated, antiseptic or germicidal preparations, can be employed for the bath. It is intended that the cover portion 11 be of a size to accommodate standard jars of luxury commodities, such as scented and/or tinted salts of high quality. In such use of the invention, it is only necessary that the usual closure (not shown) of such a jar be removed and the jar applied to the cover portion 11.

With the device installed as shown in Figure 1, and with the valve 26 open, it will be clear that upon opening the usual valve controlling the shower head, that part of the water flowing into the inlet chamber 18 will discharge therefrom through the port 17 to the shower head, and part through the port 22 into the receptacle R, so as to flow downwardly through the solid substance therein and take up particles therefrom in solution. The solution thus produced flows from the receptacle through the tube 25 into the relatively high velocity stream of untreated water flowing through the port 17 so as to intermix with the water and be dispensed from the shower head as a solution of a predetermined uniform strength.

It will be apparent that the port 17 functions as a pressure reducing means, as when the water is flowing, the chamber 18 is under slightly higher pressure than the chamber 19, the pressure difference varying in accordance with variation in the flow of the water in the supply line. It has been found in practice that by opening the tube 25 directly into the port 17, the pressure differential between the port 22 and the upper end of the tube 25 at the port 22 bears a definite relationship to the velocity of water through the port 17, and thus to the volume of water flowing from the shower head.

The functioning of the invention to produce a concentrated solution in the receptacle, and to supply this concentrate in accurately regulated amounts to the water from the source of supply so as to dispense a solution of a predetermined strength from the shower head is accomplished in the following manner.

Water is generally dispensed from the shower head at a moderate temperature at which it will hold only a certain amount of a particular solid in solution. Once that water has been admitted to the receptacle, the water therein will hold a maximum amount of the solid in solution, depending upon the temperature thereof. Thus a maximum solution upon dispensing water from the shower head will be assured, due to prior concentration of the solution in the receptacle.

When water is discharging from the shower head, a predetermined opening of the valve 26 will result in a definite amount of concentrated solution in the receptacle being delivered to the stream of untreated water flowing through the port 17. This mode of operation is effected because whenever the valve 26 is open, water from the source of supply tends to by-pass through the port 22 into the receptacle and to displace the concentrated solution existing in the receptacle, which concentrated solution is forced upwardly through the tube 25 into the stream of water traversing the port 17. The untreated water entering the receptacle mixes with the soluble solid therein and with the concentrated solution so that the receptacle is constantly being replenished with a solution of high concentration for delivery to the port 17.

I claim:

1. A solution making and dispensing device comprising a body having a tubular coupling por-

tion and a cover portion; an open topped receptacle attached to the cover portion and adapted to contain a supply of water soluble material; the coupling portion having a ported partition dividing said portion into an inlet chamber for connection to a source of water supply under pressure, and an outlet chamber for connection to a dispensing fixture; said cover portion having a by-pass port providing communication between the inlet chamber and the receptacle; and a solution tube extending from a point adjacent the bottom of the receptacle and opening through said partition to the port thereof so that water flowing through the by-pass port will coact with solid material in the receptacle to form a concentrated solution discharging through said tube and intermixing with water flowing through the port of said partition, whereby to deliver a solution of a definite strength to the dispensing fixture.

2. A solution making and dispensing device comprising a body having a tubular coupling portion and a cover portion; an open topped receptacle attached to the cover portion and adapted to contain a supply of water soluble material; the coupling portion having a ported partition dividing said portion into an inlet chamber for connection to a source of water supply under pressure, and an outlet chamber for connection to a dispensing fixture; said cover portion having a by-pass port providing communication between the inlet chamber and the receptacle; a solution tube extending from a point adjacent the bottom of the receptacle and opening through said partition to the port thereof so that water flowing through the by-pass port will coact with solid material in the receptacle to form a concentrated solution discharging through said tube and intermixing with water flowing through the port of said partition, whereby to deliver a solution of a definite strength to the dispensing fixture; and a manually adjustable valve for controlling and varying the amount of concentrated solution flowing through said tube to accordingly vary the strength of the solution delivered to the dispensing fixture.

3. A solution making and dispensing device comprising a body having a tubular coupling portion and a cover portion; an open topped receptacle attached to the cover portion and adapted to contain a supply of water soluble material; the coupling portion having a ported partition dividing said portion into an inlet chamber for connection to a source of water supply under pressure, and an outlet chamber for connection to a dispensing fixture; said cover portion having a by-pass port providing communication between the inlet chamber and the receptacle, a solution tube extending from a point adjacent the bottom of the receptacle and opening through said partition to the port thereof so that water flowing through the by-pass port will coact with solid material in the receptacle to form a concentrated solution discharging through said tube and intermixing with water flowing through the port of said partition, whereby to deliver a solution of a definite strength to the dispensing fixture; a valve for controlling and varying the amount of concentrated solution flowing through said tube, and accessible for manual adjustment from one side of the body; said cover portion having a second port placing the interior of the receptacle in communication with the outlet chamber; and means for selectively closing one or the other of said ports in the cover portion according as one

or the other of said chambers is connected to the source of water supply for the purpose described.

4. A solution making and dispensing device 5 comprising a body having a coupling portion and a cover portion; an open topped receptacle secured to the cover portion and adapted to contain a water soluble solid; means for dividing the coupling portion interiorly between its ends 10 into two chambers, and having a port providing communication between the chambers; the coupling portion having identical ends either of which is adapted for connection to a source of water supply under pressure while the other end 15 is connected to a dispensing fixture; the cover portion having by-pass ports respectively placing the chambers in communication with the receptacle; means for closing that one of the ports correlated with the chamber at the end of the 20 coupling portion connected to the dispensing fixture; means for delivering a concentrated solution from the receptacle to the port of said dividing means for mixing with water flowing through said port; and a valve for controlling the flow 25 of solution through the last means and being accessible for adjustment from one side of the

body; the end to end reversibility of the coupling portion enabling said valve to be disposed for manipulation from one side of the body or the other.

5. A solution making and dispensing device 5 comprising an integral body having an elongated tubular and open ended coupling portion, and an annularly flanged cover portion to which the length of the coupling portion is diametrically related; a partition dividing the coupling portion 10 medially of its ends into inlet and outlet chambers, the former of which is adapted for connection to a source of water supply, and the latter adapted for connection to a dispensing fixture; the partition having a port placing the cham- 15 bers in communication with each other; an open topped receptacle detachably secured to the flange of said cover portion; the cover portion having a by-pass port placing the inlet chamber in communication with the receptacle; and a 20 solution tube extending axially from the cover portion to a point adjacent the bottom of the receptacle, and having its upper end opening through said partition to the port thereof.

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