Jan. 25, 1966 J. I. HEALD 3,231,200

SHOWER HEAD AND LIQUID SOAP DISPENSING AND METERING MEANS

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Fig. 1

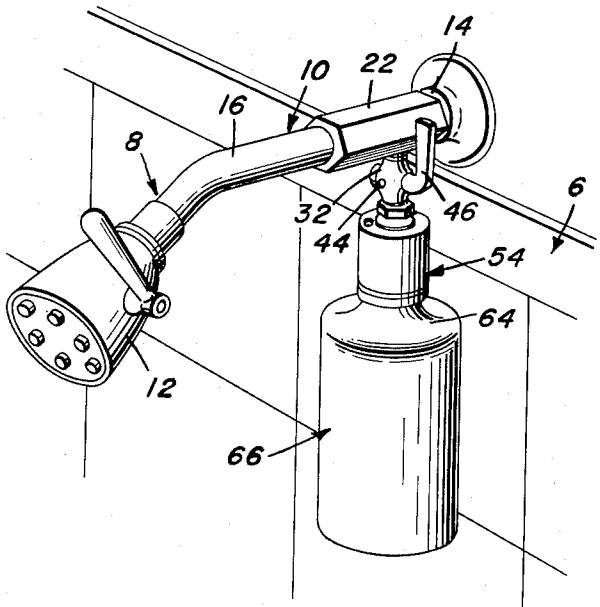


Fig. 2

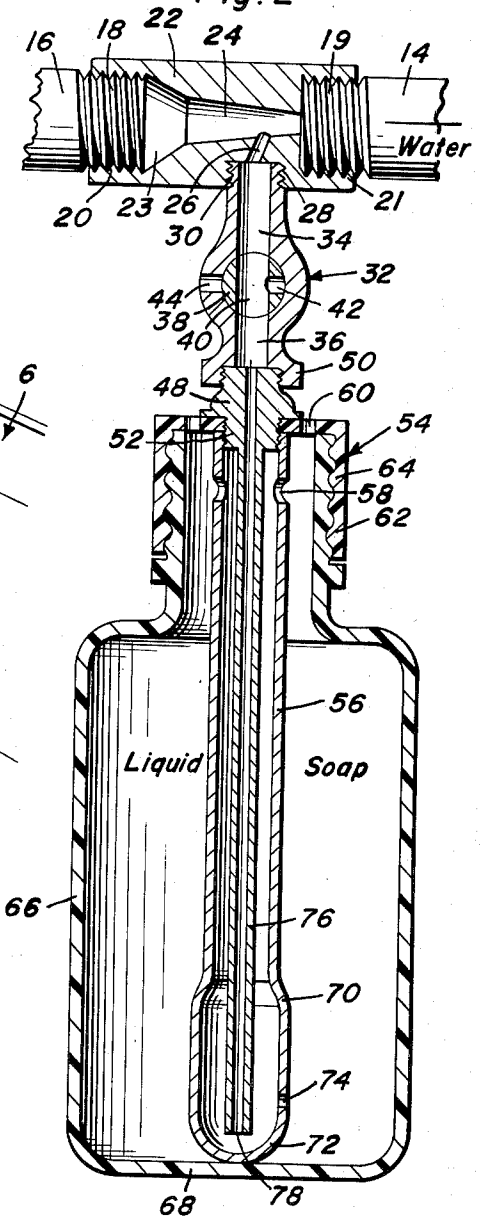


Fig. 3

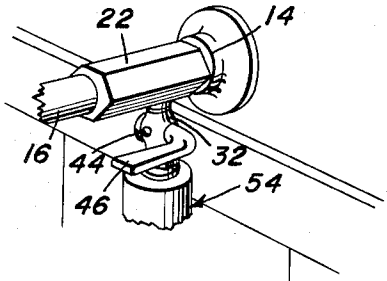
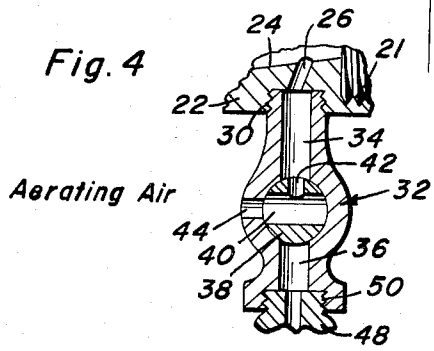


Fig. 4



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SHOWER HEAD AND LIQUID SOAP DISPENSING AND METERING MEANS

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This invention relates to a shower head which is distinct and different from prior art shower head constructions in that the portion of conduit between its stall or wall attached end and the nozzle-equipped end is provided with a specially designed coupling, said coupling having a dual-purpose valve, and the latter suspending a concentrated liquid soap container and soap metering and economizing means coordinated therewith.

By way of introduction, it seems advisable and significant to point out that the subject matter herein shown, described and claimed has to do, at least in part, with an advance in the art which is regarded as an improvement on my copending application for patent Serial No. 281,681, and now abandoned directed to a shower head siphoning means and cooperative facilities therefor. The instant matter, comparably analogous to my copending application, invokes the use of a flow through coupling incorporated in the city water delivery conduit, said coupling (often referred to generally as a T-type coupling). More particularly, the improved coupling has screw threaded ends with which sections of the shower head conduit are communicatively connected, said coupling having a gradually tapering restrictive passage for the shower water. Also, means is communicatively connected with the coupling and its passage to accommodate a suction or siphon hose or tube which is used in picking up and directly supplying atmospheric air into the flow water or stream and which can be utilized to cooperate with a liquid container and employed in such a manner that an aerated sudsy or saponaceous liquid is delivered to and proportionally mixed with the water stream which issues through the spray head or nozzle.

Experimental usage of the embodiment of the invention above identified as copending Serial No. 281,681, now abandoned has repeatedly shown that whereas the desirable step of introducing atmospheric air into the pressurized shower water passing through the conduit is thought to be an acceptably satisfactory water aerating step, an additional soaping or sudsing step (which utilizes aerated liquid soap from a suitable complemental container) and which functions to automatically lather the body of the user, has proved out to be objectionable because of the fact that it takes only about one minute to dissipate approximately fourteen ounces of liquid soap. It follows that a significant objective in the instant improved disclosure is to not only retard but to appreciably prolong and effectually maintain the aerated sudsing step uninterruptedly but, and this is important, to minutely meter the discharge of the liquid soap from its container so that it is now twenty times, more or less, as economical to utilize the improved construction than is accomplished when using the aforementioned copending adaption.

Also, and as will be hereinafter more clearly disclosed and appreciated, the present invention utilizes, briefly construed, a concentrated liquid soap bottle or container preferably having a threaded neck to be suspended from a supported screw cap, and a soap intake, metering, agitating and sudsing device which is such that it depends into the container when the latter is attached for use. This device has a plurality of air intake ports adjacent the upper end and above the soap level for drawing in air when suction is applied. It also has air intake means adjacent the bottom which functions to draw the concentrated liquid soap in drop-by-drop manner into a collecting chamber where agitation takes place preparatory to siphoning the aerated lather or bubbles into the aforementioned coupling for mixture with the outgoing pressurized shower water.

Also, and as will be hereinafter evident, a shower head constructed in accordance with the present invention acts on the soap concentrate by way of a vertically elongated vessel-like tube which depends into the soap in the container and, having a restricted intake orifice, results in the taking into the bulbous like chamber thereof mixable drops during the sudsing step, aerates it to a point of maximum saponification before it is elevated by the suction or siphoning tube into the aforementioned T-coupling for admixture with the outflowing water.

To be more specific, what happens is that during the sudsing step air is drawn into the metering and economizing tube and is mixed with each drop of the incoming concentrated liquid soap, that is as it seeps through the restricted orifice (weep hole) and during which time the turbulence which takes place in the bulbous-like trap acts to transform the air and droplets of soap concentrate into the aerated product to be elevated and mixed with the shower water. In fact it may be added that the invention functions to bring about the desired intake, agitating and mixing steps with the action so fast that there is a virtually continuous aerated soapy water which is dispensed from the spray head or nozzle, the soap in the container being so slowly used up that its progressive disappearance is almost imperceptible.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a view showing a fragmentary portion of a shower stall with the shower head (nozzle supported conduit) and which has the improved coupling and aerated soap supply means embodied and thus readied for use.

FIG. 2 is a view on an appreciably enlarged scale with parts and section in elevation which serves to show the aforementioned special restriction coupling, depending valve, and the additional component parts suspended from the valve to provide the economized soap supply result.

FIG. 3 is a fragmentary view the purpose of which is to show how the valve handle is turned to utilize the valve to optionally take in shower water aerating air as a step preparatory to siphoning the aerated liquid soap and mixing it with the shower water.

FIG. 4 is a view based on FIG. 3 and showing the valve element in open aerating air intake position.

Referring now to FIG. 1, the numeral **6** designates the shower stall or an equivalent wall (with or without the tub) and from and beyond which the shower head **8** projects. The expression "shower head" here used comprises the pressurized or city water delivery conduit **10** on whose discharge end the spray head or equivalent nozzle **12** is operatively supported. In the instant case the conduit comprises an inward supply pipe connection or nipple **14** and a complemental section **16**. The threaded ends **18** and **19** of these sections are screwed into outer and inner screw threaded sockets **20** and **21** provided therefor at the ends of the special T or equivalent coupling **22**. It will be noticed in FIG. 2 that the longitudinal passage or bore through this coupling has complemental gradually tapering or restricted conical portions **23** and **24** which together provide a venturi-like passage. This passage functions with the aid of the side auxiliary intake passage **26** in providing the desired restriction and siphoning result. A screw threaded socket **28** in the bottom of the coupling communicates with the

auxiliary passage 26. The threaded end 30 of a dual-purpose globe-type valve 32 is screwed into the socket 28. The main flow passage through the valve is denoted at 34, the intake end thereof being denoted in FIG. 2 at 36. The rotary valve element 38 has a main passage 40 which registrable as seen in FIG. 2 with the flow passage 34. It is also provided on one side with an optionally usable restricted air intake port 42 which is selectively registrable with the atmospheric air inlet 44 in the valve body. By comparing FIGS. 2 and 4 the controllable action of the valve element will be clear. For example, as shown in FIGS. 3 and 4, by turning the crank handle 46 to the horizontal position shown the pssage 40 then lines up with the intake 44 and the port 42 lines up with the passage 34 so as to introduce atmospheric aerating air in a manner to be described.

A special screw threaded fitting 48 is screwed into the flanged end 50 of the valve in the manner shown in FIG. 2 and the threaded lower portion 52 thereof is simultaneously connected with and supports inverted screw threaded cap 54 and the aforementioned liquid soap metering, proportioning, agitating and aerating means 56. Specifically, this means comprises a tube of prerequisite length having its upper screw threaded end joined with the fitting 52 and provided with a plurality of circumferentially spaced air intake ports 58 communicable with the atmospheric air inlet holes or vents 60 in the top of the screw cap 54. In practice the screw threaded rim 62 of this cap serves to support the screw threaded neck 64 at the top of the concentrated liquid soap container 66. The container is here shown in the form of a soap concentrate containing plastic or equivalent bottle whose bottom is denoted at 68. It is within the purview of the invention to retail this special soap concentrate bottle so that it may be taken home, the screw cap (not shown) removed after which the screw threaded neck 64 can then be screwed up into the special adapter cap 54. Getting back to the economizing and metering tube 56, it will be noted that the lower end thereof is of bulbous form as at 70 and it is provided near its curvate bottom 72 with a single restricted soap intake orifice 74. Reverting to the fitting 48 it will be noted that this fitting is provided with a depending suction or siphoning tube 76 whose lower end 78 depends to a level below the orifice 74 but terminates in a plane above the convex end 72. This cooperation of (1) the end 78, (2) orifice 74 and (3) bulbous part 70 provides a significantly unique soap-drop accumulating and agitating chamber or well.

It will be evident that the screw threaded upper end portion 30 of the valve 32 screws into the socket 28 provided therefor in proper alignment with the restricted passage 26 which opens into the flow restriction passage 23 and 24. This valve is unique in that it can be operated in the manner shown in FIGS. 3 and 4 for the purpose of sucking in air when the shower head is turned on. Consequently, the user can, as a first step, merely aerate the shower water. When this invigorating initial step has been completed the shower water can be further treated by the addition thereto of the desired aerated sudsy additive, that is, the air and soap mixed and sucked into the passage 23 and 24 for admixture with the outflowing shower water.

Inasmuch as the diameter of the orifice or seepage hole 74 is sized in ratio to the concentration of liquid soap, movement of air, and size of expansion area 70, the correct amount of concentrated liquid soap to air in motion gives the maximum aerification of the soap before being blended in the shower water for sudsing purposes.

Without the featured improvement (see parts 56, 70, 72, 74, 76 and 78) it would take about one minute to dissipate approximately fourteen ounces of liquid soap from the container or bottle. But with the improvements, as brought out in FIG. 2, it takes at least twenty

minutes more or less to empty the soap bottle or container in a progressive step-by-step economizing manner.

The atomization of liquid concentrate in air causes each drop to convert itself into an effective suds upon contact with the flowing water, and automatically accomplishes a commercial and practical way of cleaning and softening one's skin in a shower bath.

The weight of the liquid soap concentrate, combined with the velocity of air, and the size of the soap hole or orifice 74 in the outer tube portion 70, determines the richness of suds, when combined in the flow of water. The velocity of air is determined by the velocity of water flow, thus the metering ratio remains the same.

In a revealing test with the outer tube 56, I found my invention provided six gallons of suds in a three minute period with water pressure at fifty pounds, and consumed only one and one-half ounces of liquid concentrate. This means approximately 768 ounces of suds. Dividing 1½ ounces of concentrate into 768 ounces of suds, means that approximately 500 parts of suds are created from the use of each part of liquid concentrate. This means that a person can take his time while cleaning and softening his skin with aerated, soft suds in the shower, without being subjected to slippery, wasteful, too strong a concentrate, too costly, too inconvenient method of having to refill the container, or to be subjected to having to shut off the soaping period sooner than desired for conservation purposes.

This means good therapy. Knowing the economical advantages of this means of metering the soap or oil, a person is inclined to relax and enjoy the warm, soft sudsing he feels during the soaping phase.

It is submitted that the careful consideration of the specification in conjunction with the illustrative views of the drawing and the invention is claimed will enable the reader to obtain a clear and comprehensive understanding of the present invention. Under the circumstances, a more extended description is regarded as unnecessary.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In combination, a shower head assembly embodying a conduit having a water-intake nipple section at an inner end, a nozzle downturned section at an outer end provided with a terminal manually regulatable shower head, the inner adjacent end portions of said sections being axially aligned and connected together by an intervening coupling having a gradually enlarged axial passage therethrough, said passage tapering and constituting venturi restriction, a median portion of said coupling being provided with a proportionally restricted auxiliary orifice and further provided with a depending globe-type valve the passage of which is in communication with said venturi by way of said auxiliary orifice, said globe valve having a limited aerating intake port in one side and having a valve element which is conveniently and accessibly openable and controllable, an elongated siphoning tube connected communicatively at an upper end to the lower end of the passage in said valve and depending therefrom and open at its bottom, a container attaching and supporting cap having a top portion provided with air vents and a depending screw-threaded rim portion, a concentrated liquid soap container having a neck at its upper end connected to and suspended removably from said rim portion, said siphoning tube extending axially down into the container portion of the container and having its lower end terminating adjacent the bottom thereof, and a second tube complemental to said siphoning tube and enclosing said siphoning tube and having an upper

end cooperatively associated with said cap and the upper end of said siphoning tube and provided with circumferentially spaced air intake ports, the lower end of said second tube enclosing the lower open end of said siphoning tube, being radially spaced therefrom and providing a soap concentrate receiving and mixing chamber and provided with a single restricted soap seepage hole communicating with the container portion and said chamber and located at a level above the level of the lower open end of said siphoning tube.

2. In combination, a shower head assembly embodying a conduit having a pressurized water intake at an inner end, a manually regulatable shower head at its outer discharge end, a venturi restriction intermediate said ends, and a valve operatively mounted on said conduit and having a manually valved passage directly communicative with said venturi restriction, said valve having a restricted optionally usable atmospheric air intake which enables the user to open the valve and introduce and mix aerating air with the shower water, said valve being provided with a main axial passage which is structurally designed and adapted to suck and deliver aerated liquid soap therethrough and directly into a median part of the venturi restriction, said valve being also provided with a valve element for opening and closing the air inlet, said valve element being provided with an external easily accessible and reachable valve handle, said valve handle being selectively positionable so that the user can open and close the axial passage or alternatively, the air inlet at will, said valve being provided at the lower end thereof with a complemental open-ended siphoning tube provided at its upper end with a screw-threaded axially bored fitting, said fitting being connected with a screw-threaded bottom portion of said valve and having its bore registering with said main pasage, a bottle supporting cap connected centrally to and supported by said fitting, said cap having air intake vents, and a second tube complemental to said siphoning tube and having an upper end connected to the fitting, said upper end being provided proximal to said fitting with air inlet orifices, the lower end of said tube being enlarged, of bulbous form and provided with an intake orifice for concentrated liquid soap, said siphoning tube telescoping into said second tube and having its lower end terminating above the bottom of said bulbous portion at a level below said soap intake orifice.

3. In a structure of the class described, a coupling adapted to be incorporated in the median portion of a fluid conducting conduit having a pressure-drop flow restriction passage, provided in one side intermediate its ends with a restricted auxiliary passage communicating with the flow restriction passage and being further provided with a manually regulatable selective valve, said valve being of a two-way construction and having a limited aerating air intake port in one side and being provided at its bottom with an aerated liquid soap intake, a valve element mounted in the body of the valve and operable for opening and closing the respective aerated air and aerated liquid soap intake, a fitting operatively attached to the bottom of said valve and provided with a depending siphoning tube, said fitting having and supporting a cooperating cap, said cap having air intake

ports, an elongated second tube encasing and sheathing the first named tube and having its upper end connected to said fitting, said upper end provided with air intake ports, the lower end having a restricted soap intake orifice cooperating with the adjacent lower end of said first named tube.

4. In combination, a shower head assembly embodying a conduit having a water-intake nipple section at an inner end, a complemental downturned section at an outer end provided with a terminal manually regulatable shower head, the inner adjacent end portions of said sections being axially aligned and connected together by an intervening coupling having a gradually enlarged axial passage tapering and constituting a venturi restriction, a median portion of said coupling being provided with a proportionally restricted auxiliary orifice and further provided with a depending globe-type valve the passage of which is in communication with said venturi restriction by way of said auxiliary orifice, said globe valve having a limited aerating intake port in one side and having a valve element which is conveniently and accessibly openable and controllable, an elongated siphoning tube communicatively joined at an upper end to the lower end of the passage in said valve and depending therefrom and open at its bottom, a container attaching and supporting cap provided with air vents and a depending screw-threaded rim portion, a concentrated liquid soap container having a neck at its upper end connected to and suspended removably from said rim portion, said siphoning tube extending axially down into said container and having its lower end terminating adjacent the bottom of the container portion thereof, and a second tube complemental to said siphoning tube and enclosing said siphoning tube and having an upper end cooperatively associated with said cap and the upper end of said siphoning tube and provided with circumferentially spaced air intake ports, the lower end of said second tube enclosing the lower open end of said siphoning tube, being radially spaced therefrom and providing a soap concentrate receiving and mixing chamber and being provided with at least one relatively restricted soap seepage hole communicating with said container portion and said chamber, respectively, and located at a level above the level of the lower open end of said siphoning tube as well as above the terminal bottom of said second tube.

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