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C. C. SMITH
SOAP LATHER DISPENSER
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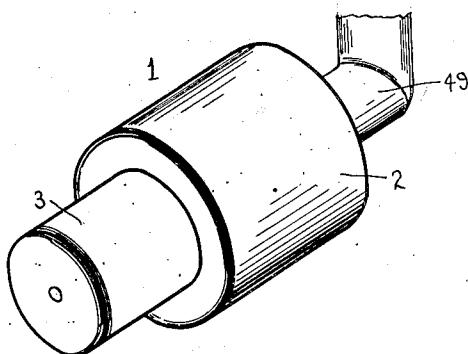


FIG. 1

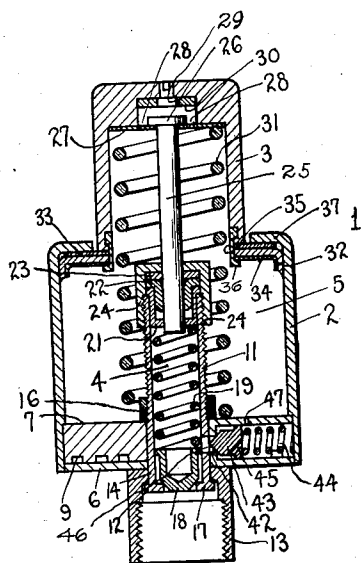


FIG. 2

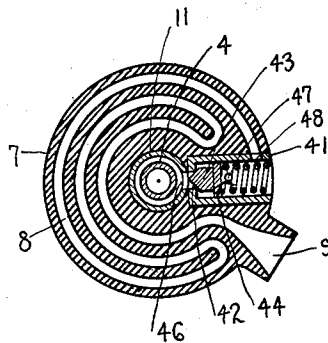


FIG. 3

INVENTOR.
CHARLES C. SMITH
BY
Pay Oberlin & Fay
ATTORNEYS

UNITED STATES PATENT OFFICE

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SOAP LATHER DISPENSER

Charles C. Smith, East Cleveland, Ohio, assignor
to Monmouth Products Company, Cleveland,
Ohio, a corporation of Ohio

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10 Claims. (Cl. 299—97)

This invention, as indicated, relates to a soap lather dispensing apparatus. More particularly it comprises a simplified form of apparatus for acting frictionally on a film of liquid soap by means of a stream of air, and conducting the intermixed air and soap particles frictionally through a length of narrow conduit to a point of discharge, whereby, instead of the user receiving liquid soap and being forced to work the same up into a lather, receives a lather ready for use.

Heretofore it has been proposed to admit small particles of liquid soap into a mixing tube with interposed globules of air to the end that a lather of a suitable degree of consistency will be supplied for use in laving the hands or other portions of the body, but in such devices the use of float-controlled valves has been included which requires a more complicated construction and involves less certainty of operation under all conditions than the present apparatus. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:

Fig. 1 is a perspective view showing one form of apparatus embodying the principles of my invention; Fig. 2 is a central vertical sectional view through the device shown in Fig. 1; and Fig. 3 is an enlarged transverse sectional view showing the mixing passageway provided with reversely curved concentrically disposed sections.

As will more clearly appear from Figs. 1 and 2 of the drawing, the apparatus 1 comprises a stationary cylindrical body portion 2 and a movable member or plunger 3. The body portion provides two chambers, an inner cylindrical liquid soap supply chamber 4, and an air chamber 5 concentric therewith. The plunger 3 is of inverted cup shape and forms part of the air chamber, providing the air seal and closure over the open end of the air chamber proper.

The parts are so formed as to permit of simplicity of manufacture and ease of assembly.

The base of the air chamber is provided by a pair of companion plates one of them a relatively thin plain disc 6, and an overlying heavier disc 7 provided with an elongated narrow conduit or

passageway 8 on the side engaging the companion disc and terminating in an enlarged discharge orifice 9 in a lateral extension on said discs. One or both of the discs 6 and 7 may be formed of any special material so as to provide a suitable surface for the conduit and to assist the frictional interaction of the liquid and air passing through the same.

The discs are centrally apertured to receive the cylinder 11 of the liquid soap supply chamber, which is formed with an outer projecting flange 12. An attaching sleeve 13 is formed with an inwardly projecting flange 14 providing a seat to engage the flange 12 of the cylinder 11. The cylinder 11 is screw-threaded on its outer surface and a nut 16 engaged thereover serves to hold the attaching sleeve 13 firmly against the lower disc 6 and to hold the discs 6 and 7 in cooperative relation.

The cylinder 11 of the liquid soap supply chamber is provided at the end adjacent the liquid soap supply tube with an inner flange 17 providing a valve seat against which a valve member 18 is pressed by means of a coil spring 19. The opposite end of the cylinder is provided with a packing gland comprising a guide member 21 of cup-like form within the cylinder having a circumferential flange engaging on the top of the cylinder and supporting within its cup-shaped interior a pair of leather packing elements 22, 23. A cap member 24 is engaged over the screw-threaded exterior portion of the sleeve to press the packing members into sealing relation with the plunger 25 which extends through suitable apertures through the respective clamping members 21 and 24. The plunger at its upper end is provided with a head member 26 against the under side of which bears a metal disc 27 having suitable apertures 28 at points adjacent said head to permit the admission of air to the air chamber, as will be hereinafter explained.

The disc 27 is seated within the base of the cup-shaped plunger member which is of relatively wide diameter. An operating spring 31 is positioned within the plunger, bearing against said disc 27 at its upper end and at its opposite end bearing against the lower wall of the air chamber. Through the top of the plunger an air vent 29 is provided, and in a recess around said vent, an annular valve disc 30 is provided. This disc is normally spaced from the head 26 of the plunger 25 and permits the free entrance of air to the air chamber 5 until the plunger 3 is forced inwardly. The cup-shaped plunger mem-

ber is provided at its free marginal portion with a piston element 32 preferably formed of leather of cup-like form tightly secured to the margins of the cup-shaped plunger by any suitable means, such as a pair of metal annular clamping members 33, 34, and a ring 35 having a feather edge 36 adapted to be spun into air-tight engagement with such members so as to grip the leather piston element between the same. The air chamber proper comprises a cylindrical member having an inturred flange 37 at its upper end and at its lower end carries the mixing chamber of the apparatus heretofore referred to. The leather piston element of the air chamber is adapted to reciprocate within the cylindrical member as the cup-shaped plunger is forced downwardly. The mixing chamber as stated comprises the discs 6 and 7, the disc 7 being provided with the outlet passageway for the mixture of liquid soap and air. This conduit or passageway 8 is formed in one face of the heavy disc and includes a groove reversely curved upon itself so as to provide an extended length within a compact area and at the same time leave free space for the outlet valve.

The outlet valve comprises a tubular housing 41 which may be formed integrally with the outside disc 6 at the base of the air chamber. The inner end of the housing is provided with a valve seat 42 against which a movable valve member 43 is adapted to be pressed by a coiled spring 44. The valve member 43 has a diagonal opening 45 through the same, through which small amounts of liquid soap may be admitted to the housing 41. The valve housing communicates with a port 46 formed through the adjacent wall of the cylinder 11 of the liquid soap chamber 4 in alinement with the opening centrally of the valve seat 42, and also communicates with the air chamber 5 through a lateral port 47, and with the inner end of the conduit 8 through a lateral opening 48.

The casing of the air chamber 5 is provided with a counter-sunk recess about its lower inner portion within which the discs 6 and 7 are engaged by a press fit, or in any other desired manner. One end of the spring 44 will then abut the inner wall of the casing to hold the valve member 43 normally in seated position.

The passageway 8 should not be of a width or cross-sectional area which would permit a film of the liquid soap to bridge the same, but should be just slightly above this cross-sectional area so as to permit air friction to act on soap particles received within such passageway and adhering to the walls thereof.

The length of the passageway should be proportioned to the character of the liquid soap used in the apparatus and should be such that a lather of the desired consistency is discharged. No length of passageway above that required to produce a suitable lather should be employed because of the greater effort required to operate the apparatus and the wastage of material as well.

It has been found that a standard liquid soap solution of from ten to twenty percent operates very satisfactorily in a passageway of five-sixty-fourths of an inch square, and of from eight to ten inches in length.

The operation of the apparatus will be evident from the description of its construction.

The liquid soap is supplied through the pipe 49 to the liquid soap chamber 4 within the apparatus, a small quantity of liquid soap moving past

the valve 18 as the plunger 25 rises to its normal position after the previous operation. The liquid soap chamber accordingly is normally filled with liquid soap. The plunger 3 is normally held in its outermost position by the spring 31 and air may freely enter the air chamber 5 through the vent 29.

When it is desired to operate the apparatus, the user presses against the plunger 3 at the same time holding his fingers beneath the discharge orifice 9 which preferably is disposed adjacent the lower portion of the apparatus. As the plunger moves inwardly, the annular disc 30 will be brought against the head of the inner plunger rod 25, and will seal the air chamber, and at the same time cause the two plungers to move together in an inward direction. This movement will force some of the liquid soap past the valve 43 and into the housing 41. At the same time air will be forced into the housing 41 through the opening 47 and the mixture of liquid soap and air will pass through the opening 48 in the housing into the conduit or passageway 8. As has been stated, the liquid soap will form a film on the walls of the conduit, and the air moving past the same will exert friction thereon and progressively interact upon the same until by the time the discharge orifice is reached, the lather will be of the desired consistency.

It has been found that the device is adapted to provide lather of the proper characteristics with liquid soap solutions of from ten to twenty percent by pressing the plunger one or two times, whereas in ordinary practice the corresponding plunger of a liquid soap apparatus is operated a half dozen or more times on a much more concentrated solution.

The apparatus thus prevents needless waste of the liquid soap supply, as well as effects a saving in time for the user by delivering the soap as a perfect lather rather than in the liquid form to be worked more or less successfully into a lather.

While the apparatus has been described as a liquid soap dispensing device, it is to be understood that it is not intended to limit the scope of the application of the invention to that particular field, inasmuch as the principles of the invention would be of service in connection with the production of a froth, or the like, in many different liquids or combinations thereof.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A soap lather dispenser comprising a liquid soap compartment, an air compartment, and means for forcing a predetermined amount of air and a predetermined measured amount of soap from said compartments through a common passageway of narrow cross-section and extended length simultaneously toward a point of discharge.

2. A soap lather dispenser comprising a liquid soap compartment, an air compartment, and means for forcing a predetermined amount of air and an amount of soap measured separately from said air from said compartments through a common passageway of narrow cross-section and extended length simultaneously to a point of discharge.

3. A soap lather dispenser comprising a liquid soap compartment, an air compartment, and a pair of related plungers adapted to be moved in predetermined relation to each other to force liquid soap and air through a common passageway of narrow cross-section and extended length simultaneously to a point of discharge.
4. A soap lather dispenser comprising a liquid soap compartment, an air compartment, and a pair of related plungers, unitary means for moving said plungers to force a predetermined amount of air and liquid soap through a common passageway of narrow cross-section and extended length simultaneously to a point of discharge.
5. An apparatus of the character described having in combination a source of liquid soap supply, a liquid soap chamber associated therewith, an air chamber positioned adjacent said liquid soap chamber, a plunger within each of said chambers, and means for moving said plungers in predetermined relation so as to force the contents of said chambers through a common passageway of narrow cross-section and extended length simultaneously to a point of discharge.
6. A lather dispensing device comprising a tubular member leading to a source of liquid soap supply, a small cylindrical liquid soap dispensing chamber attached to said tubular member and having a valve adjacent said liquid supply tube and having a plunger in its opposite end, an air chamber concentric with said liquid soap chamber, the base of said air chamber being formed by a composite disc provided with a narrow discharge passageway leading from a point of connection with said air and soap chambers to a point of discharge, and having a series of connected concentrically arranged sections providing a greater length of passage to said point of discharge, and plungers associated with each of said chambers and adapted to force a mixture of air and liquid soap into said passageway.
7. A soap lather dispensing device comprising a source of liquid soap supply, an auxiliary liquid soap chamber connected therewith, valve inlet and outlet ports for said auxiliary chamber, a plunger within said auxiliary chamber, means for actuating said plunger, an air chamber adjacent said auxiliary chamber, a plunger within said air chamber, a passageway of long and narrow dimensions having an entrance connected with said auxiliary chamber and air chamber and adapted to simultaneously receive a predetermined mixture of liquid soap and air upon the operation of said plungers.
8. A soap lather dispensing device having in combination a liquid soap supply chamber, a long narrow outlet passageway connected with said chamber, an air chamber adjacent said liquid soap supply chamber and connected with said outlet passageway, and means for applying pressure simultaneously to the contents of said liquid soap supply chamber and said air chamber so as to extrude separately measured quantities of soap and air therefrom to said passageway.
9. A soap lather dispenser comprising a liquid soap compartment, an air compartment, a common passageway for said liquid soap and air of narrow cross-section and extended length, means in said passageway for bringing liquid soap and air into intimate contact, and means for forcing a predetermined amount of air and a predetermined amount of soap from said compartments through said common passageway simultaneously toward a point of discharge.
10. A soap lather dispenser comprising a liquid soap compartment, an air compartment, a common passageway for said liquid soap and air of narrow cross-section and extended length, a spiral element disposed in said passageway for bringing liquid soap and air into intimate contact, and means for forcing a predetermined amount of air and a predetermined amount of soap from said compartments through said common passageway simultaneously toward a point of discharge.

CHARLES C. SMITH. 45