Dec. 13, 1938. W. J. DOBKIN 2,139,735

LATHER DISPENSER

Filed June 12, 1936

Fig. 1.

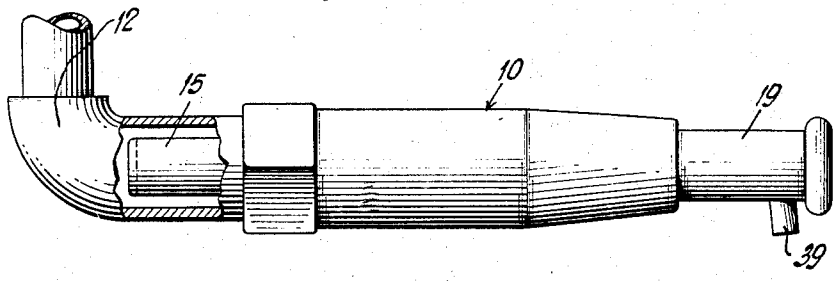


Fig. 2.

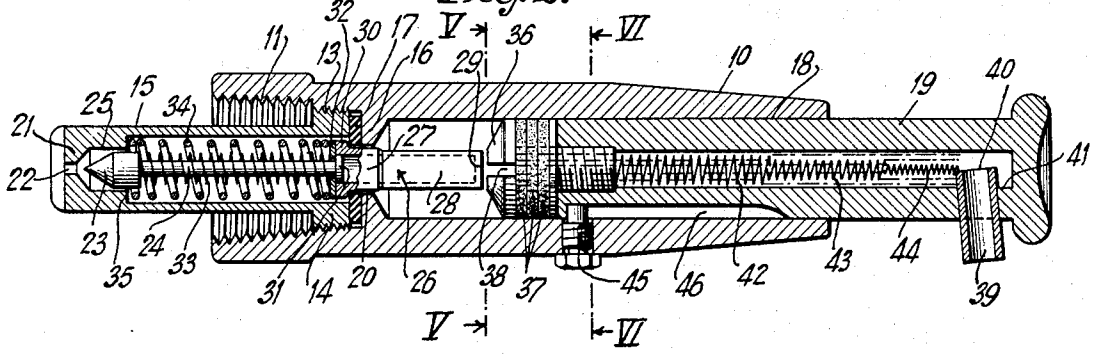


Fig. 3.

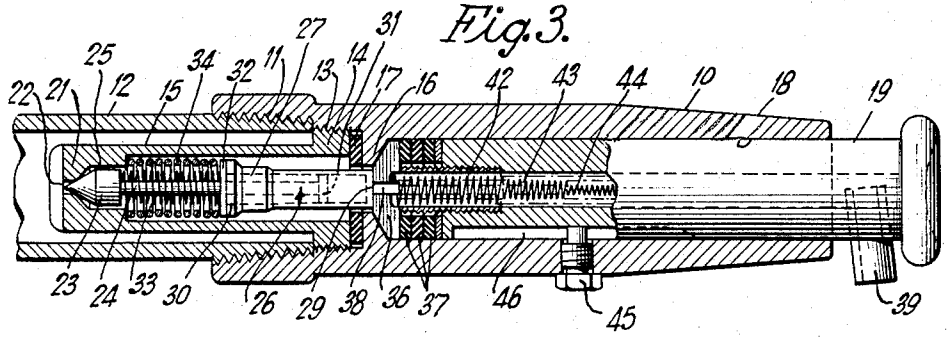


Fig. 4.

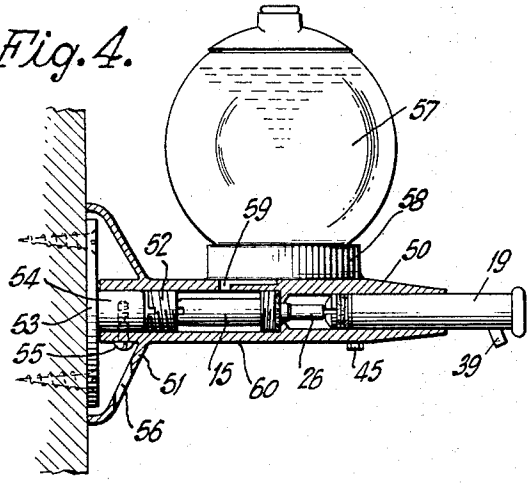


Fig. 5.

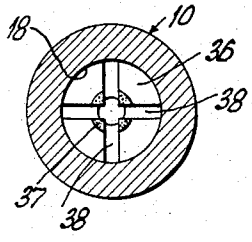
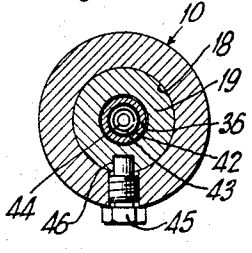


Fig. 6.



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LATHER DISPENSER

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Application June 12, 1936, Serial No. 84,789

11 Claims. (Cl. 299—83)

This invention relates to lather dispensers.

This invention is an improvement on and the disclosure involves some features which are claimed in applicant's copending application, Serial #737,379.

It is an object of this invention to provide a dispenser which will control the utilization of liquid soap and its conversion into lather, and its dispensing as lather without danger of dripping of the soap.

It is a further object to provide a device of the character described which will be reliable in its operation and inexpensive in manufacture.

It is a further object to provide a device of the character described in which the plunger mechanism may be removed for repair or inspection without disturbing the internal valves of the assembly so that its removal may be accomplished without disassembling the device from the soap supply.

It is a further object to provide a device of the character described which will measure predetermined amounts of soap and air and cause them to be thoroughly commingled into lather, but in which the soap control device may extend backwardly into the fittings to which the dispenser is attached and thereby make it possible to place the dispenser closer to the wall even when little clearance can be had within or at the wall.

It is a further object to provide a dispenser in which the valve mechanism is carried as a unit and may be inserted and removed or replaced as a unit within the device.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises an article of manufacture possessing the features, properties, and the relation of elements which will be exemplified in the article hereinafter described and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawing, in which:

Figure 1 is a side elevation of a device embodying this invention.

Figure 2 is a central longitudinal section of the same to a slightly enlarged scale.

Figure 3 is a view similar to Figure 2, but with the plunger in a different position.

Figure 4 is a side elevation partly in section of a modification.

Figures 5 and 6 are respectively sections along the lines V—V and VI—VI of Figure 2.

This dispenser comprises primarily a cylinder 10, having at one end a threaded recess 11 by which it may be attached to any common pipe fitting as for example an elbow 12, which may be connected to a source of soap supply. The recess 11 communicates with an inner recess 13 which is also threaded to receive a threaded boss 14 upon a hollow stud 15 adapted to extend outwardly from the cylinder 10 into the elbow 12. The recess 13 terminates in a shoulder 16 between which and the end of the boss 14 there is provided a washer 17. The thread upon the boss 14 is preferably left hand. The cylinder 10 has at its other end a bore 18 for the reception of a plunger 19. A central opening 20 through the shoulder 16 affords communication between the interior of the bore 18 and the interior of the hollow stud 15. The outer end of the stud 15 has a shoulder 21 through which there is provided an orifice 22, thus forming a valve seat for a needle valve 23, carried by a stem 24, along the axis of the stud. The needle valve may be maintained centered by a socket 25 in which it loosely moves.

A second stud 26 having an enlarged body portion 27, and a reduced body portion 28 closed at its end as shown at 29, and having a head 30 at the other end, extends through the washer 17 and opening 20 into the bore 18, the head 30 being of such size as to engage the washer 17 and close the opening 20, but the reduced body being small enough to admit soap around the body.

The stud 26 is hollow to receive and serve as a guide for a small head 31 on the end of the stem 24, and a washer 32 surrounds the stem 24 and is retained by the head 31. A spring 33 bears against the needle valve 23 at one end and against the washer 32 at the other, and a second and heavier spring 34 is compressed between the washer 32 and a shoulder 35 on the interior of the stud 15 to urge the washer 32 to the right, and with it the stud 26, the stem 24, and valve 23.

The plunger 19 is hollow and is partially closed at its outer end by a screw 36 having a central opening therethrough, there being packing washers 37 held between the screw 36 and the end of the plunger.

The proportion of the parts is such that as the plunger 19 is pressed in by the hand, the screw 36 engages the end of the stud 26 and presses it inwardly against the action of spring 34. This carries the needle valve in far enough to cause it to be seated on its seat. Thereafter further

pressing inward of the plunger will compress both spring 34 and spring 33.

Slots 38 in the head of screw 36 afford communication between the bore 18 and the interior of the plunger 19. The plunger is provided with a discharge spout 39 extending outwardly at its outer end, but this discharge spout also extends upwardly as shown at 40, into the interior of the plunger above the level 41 of the lower inner wall. This construction has proven especially useful in that it eliminates the tendency to drip.

A plurality of concentric springs 42, 43, and 44 is provided within the plunger to break up the air and soap in a lather. These springs each extend substantially the full length of the plunger, but for purposes of illustration the outer springs are broken away to show the inner ones. A screw 45 in the cylinder 10 extends into a slot 46 in the plunger to hold the latter in place.

The form of the invention shown in Figure 4 is the same, except that in that figure the cylinder 50 extends inwardly beyond the end of the stud 15 and is provided with brackets 51. The inner end of cylinder 10 may be closed by a plug 52. A plate 53 of a size to be concealed by the brackets 51 is attached to the wall and carries a centrally disposed supporting stud 54 over which the inner end of the cylinder 50 may fit to be retained by a screw 55, accessible through an opening 56.

A soap receptacle 57 is carried by a flange 58 upon the cylinder 50 and a conduit 59 affords communication between the interior of the receptacle and the interior of the projected portion 60 of the cylinder 50 around the stud 15.

The operation of the device is as follows:—

Starting with the plunger 19 extended as shown in the position of Figure 2 and with the device in regular operation, the stud 15 is filled with liquid soap and the bore 18 behind the plunger and the bore of the plunger are filled with different mixtures of soap and air. From this position as the plunger 19 is thrust inwardly, it engages the stud 26 and through it insures that the needle valve 23 is closed, if it is not already closed. Thereafter, there is discharged into the bore 18 an amount of liquid soap equal to the volume of that portion of the stud 26 which passes through the washer 17. During this inward movement, also the plunger 19 forces the contents of the bore 18 into the interior of the plunger 19, and, if the clearance of the plunger in the bore be small, as shown, this may also include soap which is being simultaneously delivered from the stud 15. This forces the contents of the plunger 19 to discharge over the surface of the springs 42, 43, and 44, the coarser bubbles being broken up as they go out to form a fine creamy lather.

Thus the inward stroke forces a definite amount of soap into the bore 18 from the stud 15 comprising the actual displacement of the plunger 26. When the plunger 19 is released, it is forced outwardly by spring 34 creating a suction in the interior of the bore 18 and of plunger 19 which draws a mixture of soap and air from the interior of the plunger 19 into the bore 18 and replaces it with air drawn into the plunger from the outside. This incoming air rushing over the spring surfaces coated with soap is quickly broken up into coarse bubbles, to be still further broken up and refined on the instroke as above described.

During this outstroke, the stud 26 is being forced out of the stud 15 by the spring 34 creating a suction within the stud 15 which opens the valve 23 and allows a quantity of soap to enter the stud 15 equal in volume to the displacement of the stud 26. During this action, the pressures within the cylinder 15 are relatively low, being limited by the pressure of the spring 34, so that substantially no material is sucked back into the bore of the stud 15 around the stud 26, for it will be readily understood that when these surfaces become coated with soap they offer considerable resistance to the passage of bubbles of air. It will, moreover, be noted that during this action, the pressure within the bore 18 and that within the stud 15 are relatively balanced, which assists in preventing the passage of any soap from the bore 18 around the stud 26 on the outstroke.

It will thus be seen that a definite quantity of soap is discharged into the bore 18 on each instroke which is equal to the displacement of the stud 26 in its movement, and at the same time a definite quantity of air is drawn into the interior through the discharge opening 39 which is equal to the displacement of the plunger 19. The parts are so proportioned that these definite quantities of soap and air are thus required to form a lather of the desired consistency.

The foregoing construction has many advantages. By reason of the fact that the valve mechanism is carried wholly within the cylinder and while operated by the plunger is not connected thereto, it is possible to remove the plunger in making repairs and adjust the washers or clean the parts without disconnecting the soap supply and without loss of soap. This is a matter of great convenience in practical maintenance.

The practical arrangement by which the stud 15 containing the valve mechanism extends into the elbow 12 affords great economies of space and makes it possible to place the dispenser in close quarters which would otherwise be inconvenient or impractical. Special advantages accrue also from the form of the assembly both from the manufacturing and operating point of view and the extension of the discharge spout inwardly of the plunger solves, in a simple manner, the problem of drip, which has heretofore been troublesome.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What I claim and desire to secure by Letters Patent is:

1. A dispenser comprising a cylinder having a bore therein extending inwardly from one end and having an opening through the opposite end, a pump means extending outwardly from said cylinder at said opposite end and forming a closure for said opening and discharging through said opening and having an operating element extending through said opening into said bore, a hollow plunger in said bore adapted to engage

said element to operate said pump means and having its interior communicating with the interior of said bore and a soap discharge orifice connected to the interior of said plunger, said pump means being constructed and arranged to deliver a quantity of liquid materially less than the volumetric displacement of the plunger, whereby air is sucked into the cylinder on each outstroke of the plunger.

2. A soap dispenser comprising a cylinder having a bore therein extending inwardly from one end and having an opening through the other end thereof, a hollow stud extending outwardly from said other end, said stud having an opening to its exterior controlled by a spring valve to admit soap and having an opening at its other end communicating with the opening in the said other end of said cylinder, an independently movable plunger moving within said last mentioned opening, spring pressed outwardly to extend into the said bore and carrying an element comprising a valve closing said opening when said plunger is in its full spring pressed position to control the flow of soap to said bore, a hollow plunger in said bore adapted to engage said first mentioned plunger to depress the same and to open said second mentioned valve and thereby pour soap into said bore there being communication between the interior of said hollow plunger and the interior of said stud and a soap discharge opening in the outer end of said hollow plunger.

3. A dispenser comprising a cylinder having bores therein extending inwardly from the opposite ends and connecting with each other, one of said bores being constructed and arranged to be connected to a soap supply to form therewith a supply chamber, a plunger pump means within said chamber having an intake communicating with the interior of said chamber and discharging into the other of said bores, and having an operating element extending into said other bore, a hollow plunger in said other bore adapted to engage said element to operate said pump means and having its interior communicating with the interior of said bore, there being a discharge opening from the interior of said hollow plunger to the exterior.

4. A dispenser comprising in combination a cylinder having a bore in each end thereof, a hollow stud screwed into the bore in one end of said cylinder, a needle valve for admitting soap to the interior of said stud and an independently movable valve mechanism for controlling communication between the interior of said stud and the other bore in said cylinder, and connecting means between said valves when the latter valve is closed to keep the former open and whereby the opening of the latter valve will close the former, a plunger slidable in the other end of said cylinder adapted to engage said valve mechanism to close said needle valve and open the valve mechanism by the depression of said plunger.

5. A soap dispenser comprising a cylinder having an axial bore extending inwardly from each end thereof, one of said bores being adapted to be connected to a soap supply to form a supply chamber, said bores being separated by an annular member held within said cylinder, a hollow stud extending outwardly of said one of said bores into said supply chamber and having an opening in its outer end, a needle valve contained within said stud for closing said opening, said needle valve having a stem with a head thereon, a second hollow stud extending through said annular member and forming a second valve therewith movable independent of said first mentioned value and affording a guide for the reception of the head of said needle valve stem, a spring for urging said needle valve toward closed position and a stronger spring for urging said second mentioned hollow stud outwardly through said annuluar member to close said second valve and to extend into the other bore of said cylinder, including a stop connection between said valves whereby when said second valve is closed said first valve is held open and a plunger slidable within said other bore to force out the contents thereof and adapted to engage said second mentioned hollow stud and force it inwardly to afford communication between the two bores and therewith to close said needle valve.

6. A device in accordance with claim 1 in which the soap discharge orifice is provided with a discharge spout extending upwardly above the level of the interior of the hollow plunger to prevent drip.

7. A soap dispenser comprising in combination a hollow cylinder, an annular means within said cylinder for separating said cylinder into a plurality of bores, one of said bores being constructed and arranged to be connected to a soap supply to form therewith a supply chamber, a hollow stud screwed into said last named bore and extending outwardly of said cylinder into said supply chamber there being an orifice controlled by a needle valve for controlling the admission of soap to the interior of said stud, a plunger within said stud and spring pressed outwardly and having operating means extending into the other bore and said plunger being provided with means to retard the flow of liquid between said bores and a hollow plunger within said other bore slidable to engage said operating means and communicating with the interior of said other bore and having a discharge opening connecting to the interior of said hollow plunger beyond said cylinder.

8. A soap dispenser comprising in combination a hollow cylinder, annular means within said cylinder for separating said cylinder into a plurality of bores, one of said bores being adapted to define a soap supply, a hollow stud screwed into said last mentioned bore and extending outwardly of said cylinder into said soap supply, an orifice controlled by a needle valve for admitting soap to the interior of said stud from said soap supply, a plunger within said stud movable independently of said needle valve and a spring between said plunger and said needle valve for operating the same adapted to press said plunger outwardly, said plunger being constructed and arranged to function with said annular means as a valve to control the admission of soap from said stud into said other bore closing the annular means when the plunger is spring pressed outwardly, connecting means between said two valves whereby when said plunger valve is held closed said needle valve is held open, means for operating said plunger extending into said other bore, and an operating element therefor within said other bore, said plunger being movable within said stud after said needle valve is closed.

9. A soap dispenser comprising a hollow stud forming a chamber having an opening in one end thereof, a needle valve carried by a stem within said chamber, a spring for pressing said valve outwardly to close said opening against the ingress of soap, a second valve situated at the other end of the stud, a second spring for urging said second valve to close said other end, said

second spring being stronger than the first mentioned spring, a connecting means between the stem and the second mentioned valve so constructed and arranged that when the said second valve is held closed by said second spring said needle valve is held slightly open, a cylinder in which said stud is mounted and having a hollow plunger therein, there being a communication between the interior of said cylinder and the interior of said stud through said second valve and means operated by said hollow plunger for opening said second valve and for forcing soap from said chamber into said cylinder.

10. A device in accordance with claim 9 in which the means for operating the second valve and forcing soap from said chamber into said cylinder comprises a second plunger extending through said communication into said bore.

11. A device in accordance with claim 9 in which the second valve and the means for forcing soap from said chamber into said cylinder comprises a plunger sliding within the communication having a portion of sufficient diameter to close said communication, an intermediate portion affording a restricted communication and a smaller portion affording a relatively free communication.

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