March 4, 1941. B. W. SEIDEL 2,233,716

LATHER DISPENSING VALVE

Filed June 6, 1938

FIG. 1.

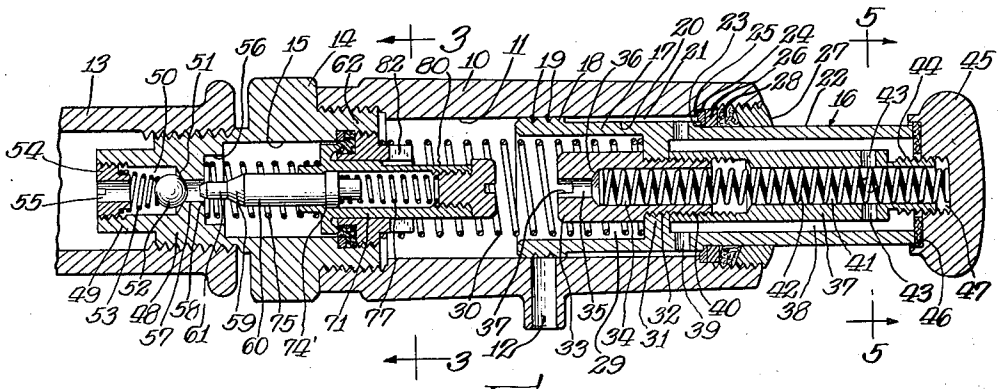


FIG. 2.

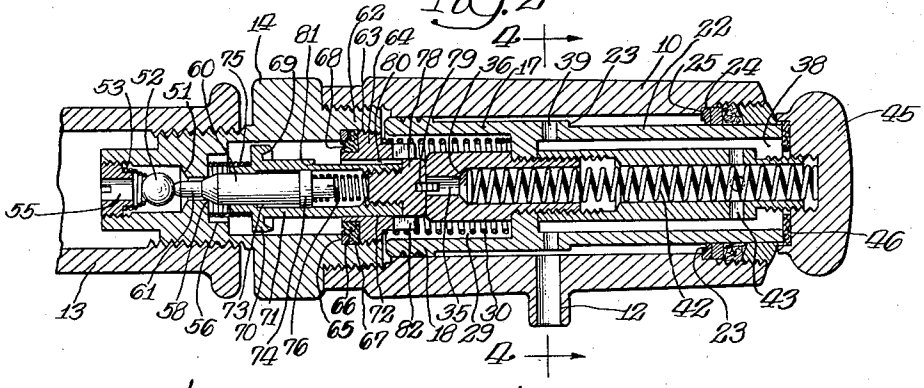


FIG. 3.

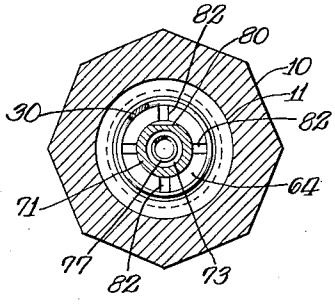


FIG. 4.

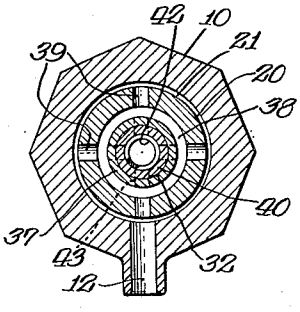
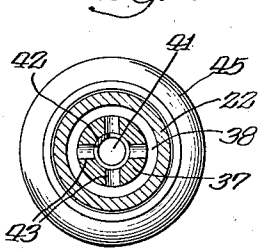


FIG. 5.



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LATHER DISPENSING VALVE

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11 Claims. (Cl. 299—83)

The present invention relates generally to a dispensing apparatus, but more particularly to toilet devices designed for the purpose of dispensing lather in washrooms and the like.

One of the primary objects of the present invention is to provide a simple and efficient lather dispensing valve having means actuated by a depressible plunger to permit a predetermined amount of liquid soap to be discharged from a supply line into the barrel of the lather valve. This charge of liquid soap is subsequently agitated and mixed with air to produce a lather which is discharged from the valve on each actuation of the plunger.

A further object of the invention is to provide a novel and improved lather dispensing valve having associated therewith an intermediate valve mechanism which is connected between the connection of the liquid soap supply and the lather dispensing valve proper so as to permit the removal of the lather valve proper for repair or cleaning without shutting off or disconnecting the liquid supply to adjacent dispensing valves.

A further object of the invention is to provide a novel and improved lather dispensing valve in which the liquid soap is adapted to travel over a circuitous path in a rectilinear direction of the plunger so as to insure positive mixture of the air and liquid soap in order to develop lather of the proper consistency before the same is discharged from the valve.

These and other objects are accomplished by providing a construction and an arrangement of the various parts in the manner hereinafter described and particularly pointed out in the appended claims.

Referring to the drawing:

Fig. 1 is an enlarged longitudinal cross sectional view of my improved lather valve showing the plunger thereof in its extended or outermost position;

Fig. 2 is a similar view with the plunger depressed inwardly showing the operating parts thereof in their relative positions at the conclusion of the stroke dispensing a single charge of lather;

Fig. 3 is a cross sectional view taken on the line 3—3 in Fig. 1;

Fig. 4 is a cross sectional view taken on the line 4—4 in Fig. 2; and

Fig. 5 is a cross sectional view taken on the line 5—5 in Fig. 1;

For the purpose of illustration I have shown my improved lather dispensing valve comprising a casing or barrel 10 having a longitudinally extending bore or chamber 11. Located in the longitudinal center and communicating with the bore 11 is a discharge port or nipple 12. Forming the connection between my improved lather dispensing valve 10 and the liquid soap supply or conduit 13, only a portion of which is shown in the drawing, is a second casing or unit 14 which has a relatively short longitudinal chamber therein indicated by the reference character 15. This chamber is a measuring chamber for measuring the amount of liquid soap to be discharged into the lather developing chamber and has an arrangement of valves therein which will hereinafter be more fully described. Reciprocally mounted in the bore 11 of the casing 10 is a plunger generally indicated by the reference character 16. The inner end of this plunger 16 is provided with a piston-like hollow head 17. The innermost end of the head is provided with an annular flange as shown at 18 which forms a relatively snug fit in the bore 10 of the casing 11. Surrounding the flange 18 are annular V-shaped grooves 19 which carry liquid soap and at least partially seal the piston head. The head 17 has a reduced diameter portion 20 forming in effect an annular chamber 21 between the head portion and the bore 11 of the casing 10. The outer portion of the plunger 16 has a reduced diameter 22 which is relatively smaller than the diameter of the head 17 so as to form a shoulder 23. The shoulder 23 is adapted to engage and stop against a leather washer 24 mounted in an annular recess or shoulder 25 in one end of the casing 10. Engaging the outer surface of the washer 24 is a metal washer 26. Positioned between a packing nut which is mounted in threaded engagement with the outer end of the casing and the washer 26 is packing material 28. The head 17 of the plunger is provided with a cylindrical recess 29 which is adapted to receive one end of the compression spring 30. The recess 29 terminates in an internal flange 31 which has an axial threaded bore 32. Mounted in threaded engagement with the threaded bore 32 is a nipple 33 which has a shoulder at one end adapted to engage the inner surface of the annular flange 31 from the head 17. The nipple 33 has an axially extending bore 34 extending therethrough. This bore 34 terminates in a reduced bore as shown at 35 at its inner end so as to form a shoulder 36. The bore 35 communicates with a transverse slot 37'. Mounted internally of and concentric with respect to the reduced portion 22 of the plunger 16 is a tubular member 37 which forms an annular chamber 38

between the member 37 and the inner wall of the plunger 16. This annular chamber 38 communicates with the annular chamber 21 surrounding the head 17 through the medium of four radially projecting apertures 39. The inner end of the tubular member is threaded as shown at 40 and is mounted in threaded engagement with the outer threaded end of the nipple 33. The tubular member 37 has a longitudinally extending bore or chamber 41 which communicates with the chamber or bore 34 of the nipple 33. Mounted in these two chambers 34 and 41 is a spring 42 which performs the function or causing the liquid soap to travel over a circuitous or ever changing path for effecting a more thorough mixing of the liquid soap with the air. This particular spring is not essential to the function and operation of my improved lather valve, but find it, however, more efficient in producing a better texture of lather. The outer end of the chamber 41 of the member 37 communicates with the chamber 38 of the plunger by radially extending bores or apertures 43 extending through the wall of the member 37. The outer end of the tubular member 37 is provided with a threaded extension 44 on which a cap or knob 45 is mounted in threaded engagement. Positioned between the cap 45 and the end of the plunger 16 is a sealing washer 46. The knob 45 is provided with an axial recess 47 in which one end of the spring 42 is seated.

The intermediate valve member 14 which forms the connection between the liquid soap supply and the main casing 10 of my improved lather dispensing valve is provided with a threaded extension 48. This extension 48 forms the connection with the liquid supply line 13, only a portion of which is shown in Figs. 1 and 2 of the drawing. The threaded extension 48 is provided with a cylindrical extension 49 of reduced diameter. These extensions 48 and 49 are provided with a longitudinally extending bore 50 which terminates in a tapered valve seat or supplemental inlet port 51. Mounted on the valve seat and adapted to close the port is a ball or valve 52 which is normally pressed against the seat by an extension spring 53. One end of the spring 53 engages the ball 52 and the other end engages an annular flange of a threaded collar 54 which is mounted in threaded engagement with the internally threaded bore of the extension 49 as clearly shown in Figs. 1 and 2 of the drawing. This threaded collar 54 is provided with a longitudinally extending bore 55 through which the liquid soap may pass into the chamber 50 of the extension 49. Formed in the threaded extension 48 of the member 14 and communicating with the bore or chamber 15 thereof, is an annular recess 56. This recess 56 and chamber 15 communicate with the chamber 50 of the extension 49 by means of the longitudinal bore 57. The bore 57 and recess 56 form in effect a sharp valve seat 58 on which the tapered portion 59 of the confining valve 60 is adapted to seat itself upon the manipulation of the plunger in the manner hereinafter described. The confining valve 60 has an inwardly projecting extension 61 of reduced diameter which is adapted to be reciprocated through the bore 57 for unseating the ball 52 from its seat. The connecting member or casing 14 is connected to the main casing 10 by an outwardly extending threaded extension 62. This threaded extension 62 is provided with an internal threaded portion 63 in which is mounted for threaded engagement a threaded collar 64. Mounted between the threaded collar 64 and a shoulder 65 of the threaded extension 63 is a metal washer 66 and a packing 67. The packing member 67 is provided with a V-shaped annular valve seat or intermediate inlet port 68 in which the annular pointed valve member 69 is adapted to seat itself. The annular valve member 69 is formed on the flange 70 of the reciprocating valve member 71. This valve member 71 and seat 68 form in effect a main inlet port to the lather valve chamber. The valve chamber 71 is adapted to reciprocate in an axially extending bore 72 formed in the sleeve 64. The valve member 71 has a longitudinally extending axial bore 73 in which the confining valve 60 is adapted to reciprocate. The outer end of the confining valve is provided with an annular flange 74 which is adapted to engage the internal surface of the bore 73 in guiding the valve 60 in its reciprocatory movement and limit its outward movement by a shoulder 74' formed on the valve member 71. Positioned in the recess 56 of the threaded extension 48 and engaging a collar on one end of the valve member 71 for normally closing the valve 69 on its seat 68 is a compression spring 75. Mounted on an outward extension 76 of the confining valve 60 is a spring 77 which has its other end engaging a cap screw 78 which in turn is mounted in threaded engagement with the outer end of the valve member 71. The valve member 78 has a transverse slot 79 which is adapted to cooperate with the transverse slot 37' of the nipple 33 in permitting passage of liquid soap through the bore 35 in a manner hereinafter more fully described. The valve member 71 is provided with a flattened side 80 which extends from a point from the approximate center of its longitudinal length as shown at 81 to its outer end so that in certain positions such as that shown in Fig. 2 of the drawing, the liquid in the chamber 15 of the connecting member 14 may pass therefrom through the flattened side 80 into the chamber or bore 11 of the casing 10 during certain portions of the reciprocation of the plunger 16. In order to further insure the communication between these two chambers when the plunger is pushed to its innermost position, I have provided four longitudinally extending slots 82 in the outwardly extending portion of the threaded collar 64. (See Figs. 2 and 3.) These slots are arranged apart at an angular magnitude of 90° about the collar so that in the event the valve member 71 is revolved, one of these will always be in communication with the flat side 80 of the valve member 71.

The function and manner of operation of my improved lather dispensing valve is as follows:

Let us assume that my improved lather dispensing valve has been connected up to the liquid supply line and that the plunger thereof has been previously reciprocated so that the chamber 15 has its allotted charge of liquid soap and that the chamber 11 of the valve casing 10 has received its allotted charge from the chamber 15 and that the lather dispensing valve is prepared to discharge the first quantity of lather from the discharge port 12 of the casing 10. Let us further assume that the operating parts of the valve are in the position shown in Fig. 1 in which position it will be observed that the ball or inlet valve 52 is on its seat 51 closing the supply of liquid soap to the intermediate chamber 15 of the connecting member 14. In this same figure it will also be observed that the intermediate inlet valve 69 of the chamber 15 is seated on its valve seat 68 closing the intermediate inlet port through the flattened sides 80 to

the chamber 11 of the valve casing 10. The valve head 17 and particularly the flange 18 closes the discharge port 12 of the chamber 21 when the plunger is in the position shown in Fig. 1. Upon the first partial movement of the plunger 16 inwardly it will be observed that the flange 18 of the plunger head 17 uncovers the port 12 so as to discharge the lather previously developed and in the chamber 21 through said port and this discharge continues until the plunger has reached its innermost position or the position shown in Fig. 2 of the drawing. During the first approximate half stroke inwardly of the plunger 16 it will be observed that the liquid soap in the valve chamber 11 will be forced through the bore 35 of the nipple member 33, thence longitudinally through the bore 34 and 41 of the member 33 and 37 respectively. The liquid soap during its travel in these chambers travels over an irregular path by reason of the spring 42 to the foremost end of the member 37 thence passes from the chamber 41 through the openings 43 adjacent the outermost ends of the plunger into the cylindrical chamber 38 of the plunger. From the foremost end of the plunger the lather is then moved inwardly longitudinally of the plunger and is discharged through the apertures 39 into the cylindrical chamber 21 surrounding the plunger head 17. From here the lather is discharged through the outlet port or nipple 12 of the lather dispensing valve 10. Simultaneously with approximately the last half of the inward stroke of the plunger 16, the inner end of the nipple 33 contacts the cap screw 78 and depresses the valve member 71 inwardly, in so doing, it carries with it the stem 60 of the confining valve so that when the extension 61 removes the ball 52 from its valve seat 51 a charge of liquid soap is then passed through the port 57 into the chamber 15 of the connecting member 14. In this connection it will be observed that upon a further movement inwardly of the confining valve 60, the tapered portion 59 of this valve will be seated on its seat 58 before the flattened portion 80 on the valve member 71 permits a communication between the valve chamber 15 of the member 14 and the valve chamber 11 of the casing 10. In this connection it will be observed that the valve 59 will be seated on its seat 58 prior to the time that the flattened side 80 on the valve member 71 forms the communication between the chamber 15 of the member 14 and the chamber 11 of the member 10. Upon a further actuation inwardly or to the position shown in Fig. 2 of the drawing, it will be seen that the flattened portion 80 forms the communication between the two chambers 11 and 15 and the spring 77 permits a yielding movement of the confining valve 60 with respect to the valve member 71. Simultaneously with the concluding inward movement of the plunger, it will also be observed that the liquid soap reaching the chamber 11 will be passed through the transverse slot 79 and 37' to the bore 35 into the longitudinal compartment or chamber 34—41 and thence through the other communicating chambers as previously described. During the major portion of the outward stroke of the plunger, the discharge port 12 is uncovered and air is drawn into the valve chambers in a reverse direction to that which is described for the travel of the lather, so that there is a sufficient amount of air delivered into the valve to develop the lather to a proper consistency.

From the above description it will be readily seen that I have provided a compact and very efficient lather dispensing valve which definitely measures the amount of liquid soap to be delivered to the main lather valve chamber and on which prevents leakage therefrom by reason of the fact that the operating parts are so arranged that the supply valve can never be opened in direct communication with the lather valve casing. In other words, the intermediate casing or valve mechanism between the lather valve proper and the liquid supply line closes the valve of the liquid supply line when the intermediate connection is opened in communication with the lather valve casing.

While in the above specification I have described one embodiment which my invention may assume in practice, it will of course be understood that the same is capable of modification and that modification may be made without departing from the spirit and scope of the invention as expressed in the following claims.

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

1. A lather dispensing device comprising a casing having an inlet port and an outlet port, a plunger operable in said casing to eject lather through said outlet port and to draw air into said casing through said outlet port, a tubular member mounted in said plunger concentric therewith so as to form a plurality of longitudinally extending chambers therein, means forming the communication in series between all of said chambers and said casing, and a spring mounted in said tubular member for effecting a thorough mixing of the air with the liquid soap.

2. A lather dispensing device comprising a casing, having an inlet port and an outlet port, a plunger operable in said casing to eject lather through said outlet port, said plunger being operable to draw air into said casing through said outlet port, a flange formed on the inner end of said plunger and adapted to close said outlet port when said plunger is in normal position, a chamber formed between said plunger and casing, a second chamber formed in said plunger and extending longitudinally of and substantially the full length of said plunger, and means forming the communication in series between said chambers.

3. A lather dispensing device comprising a casing having an inlet port and an outlet port, a plunger operable in said casing to eject lather through said outlet port, said plunger being operable to draw air into said casing through said outlet port, a flange on the inner end of said plunger adapted to close said outlet port when said plunger is in normal position, there being a tubular chamber between said plunger and said casing, a longitudinally extending tubular member mounted in said plunger dividing said plunger into a plurality of chambers extending substantially throughout the length thereof, said last named chambers communicating with each other at points adjacent the outer end of said plunger, and means for communicating said first named chamber with one of said last named chambers, all of said chambers communicating in series.

4. In a dispensing device, the combination of a casing having a main inlet port and an outlet port, a plunger operable in said casing to eject lather through said outlet port, a second casing forming the connection between the liquid supply and said first named casing, a supplemental inlet port located in said second named casing through

which liquid is supplied to said second named casing, means actuated by said plunger for controlling the passage of liquid through said main inlet port and said supplemental inlet port, and means comprising a confining valve actuated by said plunger to close said supplemental inlet port when said main inlet port is opened.

5. In a dispensing device, the combination of a casing having a main inlet port and an outlet port, a plunger operable in said casing to eject lather through said outlet port, a second casing forming the connection between the liquid supply and said first named casing, a supplemental inlet port located in said second named casing through which liquid is supplied to said second named casing, means extending into said first named casing and adapted to be engaged by said plunger during a portion of its movement for controlling the passage of liquid through said inlet ports, and means comprising a confining valve actuated by said plunger to close one of said inlet ports while the other inlet port is opened.

6. In a dispensing device the combination of a casing having a main inlet port and an outlet port, a bushing connecting the supply line to said casing, a plunger operable in said casing to eject lather through said outlet port, there being a chamber extending longitudinally through said plunger forming the communication between said ports, a supplemental inlet port controlling communication between the supply line and said bushing, a valve for said supplemental inlet port, a valve for said main inlet port, a second valve for said supplemental inlet port, and means actuated by said plunger to open and close said inlet ports in certain predetermined sequences.

7. In a dispensing device the combination of a casing having a main inlet port and an outlet port, a bushing connecting the supply line to said casing, a plunger operable in said casing to eject lather through said outlet port, a supplemental inlet port controlling communication between the supply line and said bushing, a normally closed valve for said supplemental inlet port, a normally closed valve for said main inlet port, a second normally opened valve for said supplemental inlet port, and means actuated by said plunger to successively open and close said supplemental inlet port prior to opening said main inlet port.

8. In a dispensing device, the combination of a casing having a main inlet port and an outlet port, a bushing connecting the supply line to said casing, a plunger operable in said casing to eject lather through said outlet port, a supplemental inlet port controlling communication between the supply line and said bushing, a normally closed valve for said supplemental inlet port, a normally closed valve for said main inlet port, a second normally opened valve for said supplemental inlet port, and means formed as a part of said main valve member and actuated by said plunger to successively open and close said supplemental inlet port prior to the opening of said main inlet port and simultaneously with the ejection of lather through the outlet port.

9. A lather dispensing device comprising a casing having an inlet port and an outlet port, a plunger operable in said casing to eject lather through said outlet port, said plunger being operable to draw air into said casing through said outlet port, a tubular member mounted in said plunger concentric therewith so as to form a plurality of longitudinally extending chambers therein, means forming the communication in series between all of said chambers and said casing, and a spiral member mounted in said tubular member for effecting a thorough mixing of the air with the liquid soap.

10. A lather dispensing device comprising a casing having an inlet port and an outlet port, a plunger operable in said casing to eject lather through said outlet port, said plunger being operable to draw air into said casing through said outlet port, a tubular member mounted in said plunger concentric therewith so as to form a plurality of longitudinally extending chambers therein, means forming the communication in series between all of said chambers and said casing, and an annular ribbed member mounted in said tubular member for effecting a thorough mixing of the air with the liquid soap.

11. A lather dispensing device comprising a casing having an inlet port and an outlet port, a plunger operable in said casing to eject lather to said outlet port, said plunger having longitudinally extending chambers therein, and ports located between said chambers for communicating said chambers in series with said casing, whereby said lather is circulated through all of said chambers prior to being discharged from said outlet port.

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