July 4, 1933. T. M. JONES 1,916,513

DISPENSING DEVICE

Filed July 30, 1931

Fig. 1.

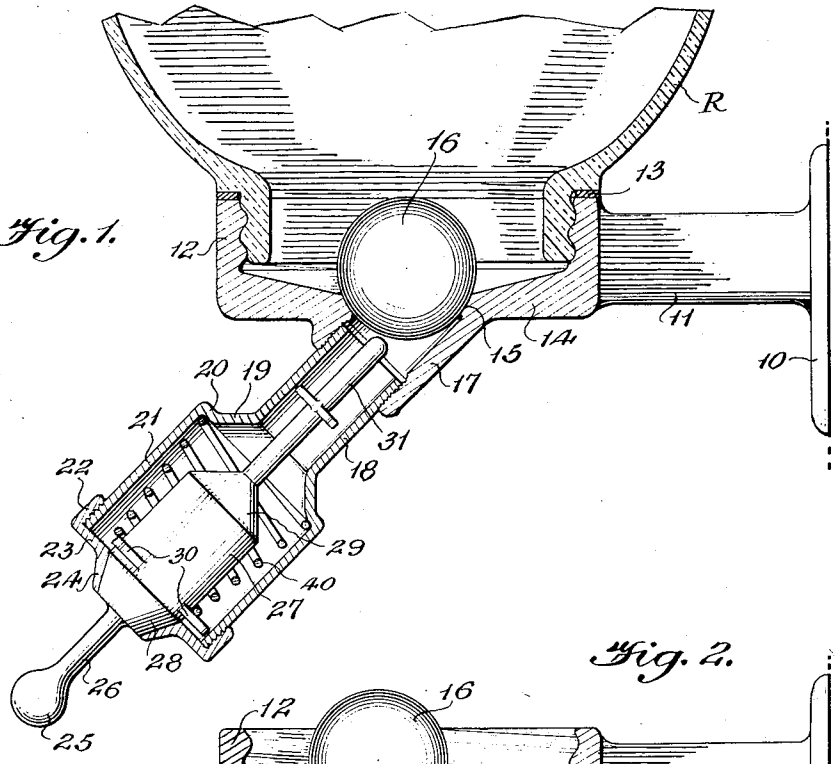


Fig. 2.

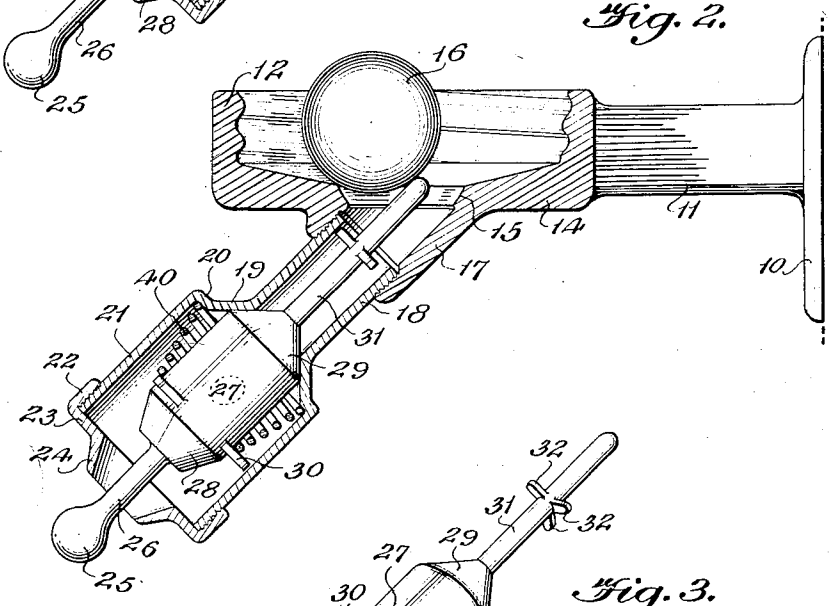
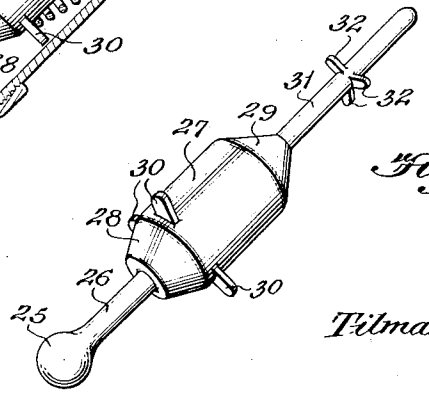


Fig. 3.



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UNITED STATES PATENT OFFICE

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DISPENSING DEVICE

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This invention relates to dispensing devices for bulk commodities such as liquid soap.

One of the features of the invention is a dispensing device in which the discharge tube and control valve are located at an acute outward angle whereby to provide a free flow for the liquid downwardly and for the replacement air upwardly.

Another feature of the device is the provision of a structure in which the externally exposed portions of the control valve assembly may be easily and quickly removed for cleansing without the liquid being permitted to flow out.

A further feature of the invention is the provision of a control plunger in the discharge tube, having a minimum contact with the tube so that the resistance to movement is slight and so that the gummy soap substance or hard soap materials which precipitate from liquid soap will not interfere with the proper operation of the plunger.

It is a further object of the invention to provide in a soap dispenser of this character a self-cleaning valve ball mounted in such a manner that it will rotate in response to the lifting thereof from a valve seat, and which valve ball is so placed relative to the lifting means that the force of the lifting means is applied eccentrically to the ball so that rotation and self-cleaning of the ball is thereby further assured.

Further features of the invention will appear in the course of the following specification and claims. An illustrative form of presenting the invention is set forth in the accompanying drawing in which:

Figure 1 is a vertical sectional view through the dispensing device and its operating parts;

Figure 2 is a corresponding view, in another position of operation, the reservoir having been removed;

Figure 3 is a perspective view of the operating plunger.

In the drawing, a plate 10 may be secured to a wall or other support and is illustrated as formed integrally with the arm 11 terminating in an internally threaded ring 12 which receives the reservoir R for the material to be dispensed, such as liquid soap. A packing gasket 13 may be interposed in the usual way. The bottom wall 14 closes the ring 12 and has a downwardly inclined conical wall leading to a central aperture providing a valve seat 15 for a ball check valve 16. This aperture terminates in an internally threaded connection 17 having its axis inclined downwardly and forwardly at an angle which preferably is about 45°. The discharge tube comprises a reduced portion 18 having threaded engagement with the connection 17, a conical flare 19, a shoulder 20 and an expanded portion 21 providing a chamber. The expanded portion 21 has screw-threads at its front end for the reception of an internally threaded ring 22 having an inwardly directed flange 23 with the flared outwardly directed wall 24.

The plunger comprises an externally projecting operating knob 25, a stem 26, a body 27 having conical ends or valve closure portions 28, 29, and the three radially extending fingers 30 having an external diameter slightly less than the internal diameter of the expanded portion 21, and an inner stem 31 having radially extending fingers 32 with an external diameter slightly less than that of the discharge tube portion 18. The radially extending fingers or guide members 30 form a guide means for the lower end of the plunger at a point within the outlet valve seat 24 of the chamber formed within the lower or front tubular wall 21, and the radial fingers 32 engage the upper or inner tube portions 18 to provide a guide means for the upper or inner portions of the plunger. The fingers 30 and 32 being relatively narrow, and having very small engagement with the walls 18 and 21, are not prevented from movement by the presence of viscous fluids in the chambers formed within the parts 21 and 18; therefore, means are provided for guiding the plunger so that it may operate for long periods of time without sticking as the result of precipitation of heavier soap materials in the dispensing valve structure.

In operation, the device at rest is in the position shown in Figure 1 in which the coni-

cal portion 28 of the body fits against the inner wall or valve seat of the flare 24. The discharge tube is therefore sealed at both ends, and the liquid is held against escape. The helical-spiral spring 40 is supported at one end against the internal wall of the shoulder 20 and at the other end rests against the radially projecting fingers 30 of the body 27.

When the plunger knob 25 is pushed upward along the line of the axis of the discharge tube, it is guided by the fingers 30 and 32. The upper end of the inner stem 31 eccentrically engages the ball 16 and forces the latter from its seat (Figure 2). If this be the first operation after the reservoir R has been filled and replaced, liquid now flows downward into the connection 17 and the reduced portion 18 of the discharge tube, but is retained by the engagement of the conical portion 29 of the plunger body 27 with the flared wall 19, and the charge is thus measured off. When the knob 25 is released, the plunger is returned angularly downward by the spring 40 so that the portion 28 is again seated against the flare 24. The separation of portion 29 from flare 19 permits the liquid in the connection 17 and in the reduced portion 18 to flow downward into the chamber within the expanded portion 21, and liquid enters the same in a quantity determined by the capacity of the discharge passages in portions 17 and 18 until the check valve 16 regains its position. The ball 16 is so mounted that when it is raised from the closed position, shown in Fig. 1, to the open position, shown in Fig. 2, it may roll to one side, and the pin 31 is so positioned relative to the ball 16 that the ball 16 is eccentrically engaged, with the result that there is a positive rotation of the ball 16 each time it is raised. The purpose of mounting the ball so that it may rotate and so that it will be further positively rotated, is to keep the ball relatively clean. Heavy, gummy, or hard soap material precipitates from the reservoir R and settles on the upper portion of the ball 16 around the edges thereof and on the upper face of the wall 14. Rotation of the ball prevents the building up of a heavy layer of such material on the ball and its effectiveness as a valve closure means is thereby preserved.

A new upward movement of the knob 25 will now return the parts to the position shown in Figure 2 and the liquid contained within the chamber of the expanding portion 21 will flow out through the aperture in the flared wall 24 and into the hand which has just operated the knob 25. A new quantity is simultaneously measured into the reduced portion 18 and the connection 17.

This operation can be continued so long as the reservoir R contains liquid. While in the position shown in Figure 2, air can flow freely upward out of the reduced portion 18 and the connection 17 in the reservoir, and by reason of the inclination of the discharge tube, the air and the liquid are separated in their lines of flow and there is a rapid refilling of the discharge tube. Likewise, the air entering through the upper part of the aperture in the flared wall 24 does not conflict with the outward flow of liquid through the lower portion of this aperture. A similar segregation of air and liquid occurs during the refilling of the chamber in the expanded portion 21 (Figure 1).

By unscrewing the ring 22, the ring and its walls 23 and 24 may be withdrawn, and the plunger with its stem and body is freed for removal from the discharge tube along with the spring 40. The aperture in the flared portion 24 is greater than the diameter of the knob 25, and hence these parts may be readily separated for cleansing. While the plunger is removed, the ball check 16 remains seated on the wall 15 and prevents flow from the reservoir R. The parts may be easily replaced by inserting the spring and the plunger and then threading the ring 22 back into position.

It is obvious that the invention is not limited to the form of construction shown but that it may be modified in mechanical ways in the scope of the appended claims.

What I claim:

1. A dispensing device for use with a reservoir having an aperture in its bottom including a ball in said reservoir of greater density than the dispensed material to close said aperture, a discharge tube extending downward from said aperture and having an outlet at its bottom, a spring and a plunger movable axially in said tube; said plunger including an operator portion extending through said outlet, a stem portion normally positioned eccentrically beneath said ball and movable to displace said ball from said opening with a rotary motion thereof, a valve portion for closing said outlet when said plunger is in normal lowermost position, and a second valve portion for closing said tube between the aperture and the outlet when said plunger is moved upwardly, said spring being located in said tube and reacting between said plunger and tube to hold said plunger normally in its lowermost position.

2. A dispensing device for use with a reservoir having an aperture in its bottom, including a ball for normally closing said aperture, said ball being adapted to roll to one side as it is raised from said aperture, a discharge tube extending downward from said reservoir and communicating through said aperture with the interior of said reservoir, said discharge tube including an expanded portion providing a chamber and a shoulder at the upper end of the chamber, a plunger movable axially in said discharge tube and including upper and lower valve members, said discharge tube providing cooperating

valve seats for selective closure by said plunger in its end positions of movement, there being means on said plunger for eccentrically engaging and raising said ball, and a spring applying force to move said plunger toward said lower valve member.

3. A dispensing device for use with a reservoir having an aperture in its bottom, including a ball for normally closing said aperture, a discharge tube extending downwardly and communicating through said aperture with said reservoir, said tube including an expanded portion providing a chamber and a shoulder and a valve seat at the upper end of the chamber and being provided with an outlet and a second valve seat at the lower end of said chamber, a plunger including pluralities of radially extending fingers for guidingly engaging the interior wall of said chamber and the wall of said tube, said plunger including a manually operable stem projecting through said outlet, there being a discharge space around said stem, and a stem for displacing said ball from its seat and also including valve members for engaging said valve seats, and means for moving said plunger outwardly in said discharge tube.

4. A dispensing device of the character described, including: an outlet member having an upper chamber and a lower chamber with an outlet opening at the lower end thereof, there being upper and lower valve seats at the respective upper and lower ends of said lower chamber; a body in said lower chamber having an upper valve closure member adapted to engage said upper valve seat and a lower valve closure member adapted to close said lower valve seat; an upper stem extending from said body into said upper chamber, there being projections on said stem for guiding the same longitudinally of said outlet member; an actuating stem extending outwardly from said body through said outlet opening; projections on said body for guiding the same longitudinally with respect to said outlet member; and a spring for normally moving said body in downward direction to resiliently maintain engagement of said lower valve closure member with said lower valve seat.

5. A dispensing device of the character described, including: an outlet member having an opening adapted to receive liquid from a reservoir, said outlet member having an upper chamber and a lower chamber with an outlet opening at the lower end thereof, there being upper and lower valve seats at the respective upper and lower ends of said lower chamber; a body in said lower chamber having an upper valve closure member adapted to engage said upper valve seat and a lower valve closure member adapted to close said lower valve seat; an upper stem extending from said body into said upper chamber, there being radially extending fingers on said stem for guiding the same longitudinally of said outlet member; an actuating stem extending outwardly from said body through said outlet opening; radially extending fingers on said body for guiding the same longitudinally with respect to said outlet member; a spring for normally moving said body in downward direction to resiliently maintain engagement of said lower valve closure member with said lower valve seat; and a ball adapted to seat downwardly in the mouth of said upper opening of said outlet member and to be engaged and raised by the upper end of said upper stem.

6. A dispensing device for use with a reservoir having an aperture in its bottom, including: a ball in said reservoir of greater density than the dispensed material to close said aperture, said ball being adapted to move laterally when it is moved upwardly from said aperture, a discharge tube extending downward from said aperture and having an outlet at its bottom, a spring, and a plunger movable axially in said tube, said plunger including an operator portion extending through said outlet, a stem portion normally positioned beneath said ball and movable to displace said ball from said opening with a rotary motion thereof, fingers on said plunger and said stem portion for centralizing the same relative to said discharge tube, a valve portion for closing said outlet when said plunger is in normal lowermost position, and a second valve portion for closing said tube between the aperture and the outlet when said plunger is moved upwardly, said spring being located in said tube and reacting between said plunger and tube to hold said plunger normally in its lowermost position.

7. A dispensing device for use with a reservoir having an aperture in its bottom, including: a check ball for normally closing said aperture, a discharge tube extending downwardly from said bottom and communicating through said aperture with the reservoir, a valve seat at the outlet end of said discharge tube, a plunger in said tube and having a valve member to close said seat when said plunger is in its lower position and a stem thereon positioned on a line of movement eccentric to said ball whereby to eccentrically engage and displace said ball from said aperture when the plunger is in its upper position, a manually operable externally projecting member connected to said plunger for actuating the same, and a spring for normally urging said plunger into position for closing said valve seat.

8. A dispensing device for use with a reservoir having an aperture in its bottom, including: a ball for normally closing said aperture, a discharge tube extending downwardly and communicating through said aperture with the reservoir, said tube including a wall portion providing a chamber having valve seats

at its upper and lower ends, a plunger movable in said discharge tube and having valve members for selectively closing said seats when said plunger is in its end positions, manually operable means on said plunger for moving the same, means on said plunger in a position to engage said ball at a point eccentric to the vertical axis of said ball, for displacing the ball from said aperture and causing it to roll to one side when said plunger is in its upper position, and means for returning the plunger to its lower position.

In testimony whereof, I affix my signature.

TILMAN M. JONES.