Feb. 28, 1950 J. R. WOLFE 2,499,205

LIQUID DISPENSER

Filed Sept. 28, 1945

Fig. 1

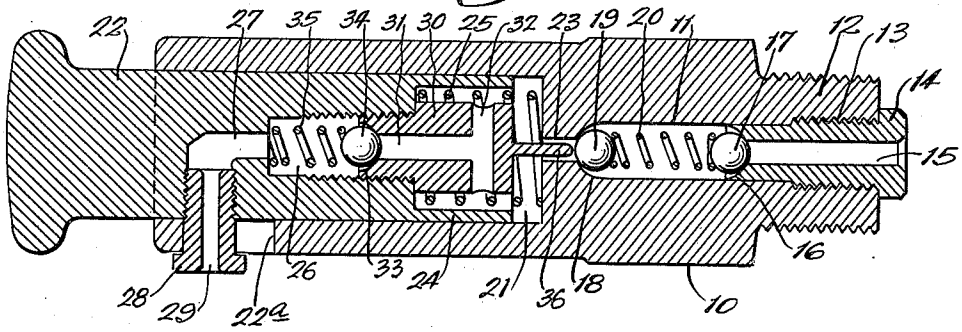



Fig. 2

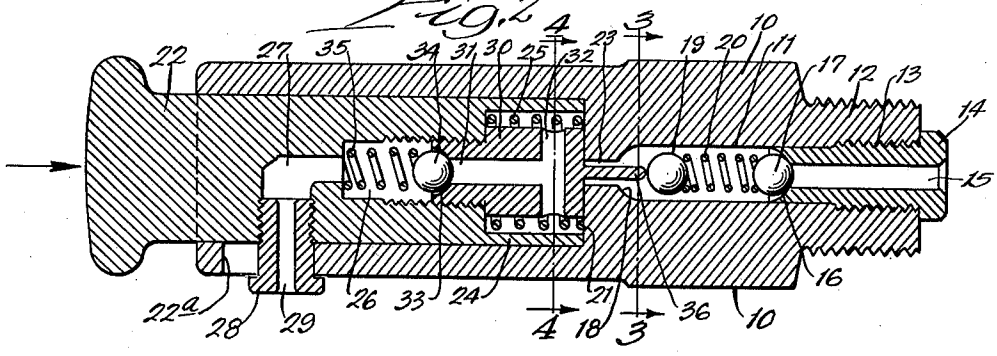



Fig. 3

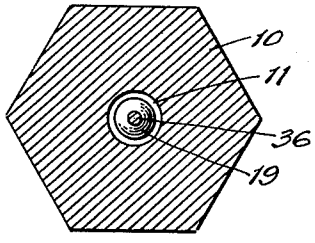
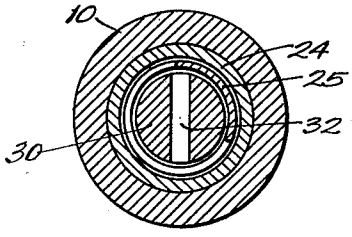



Fig. 4




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## LIQUID DISPENSER

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3 Claims. (Cl. 222—321)

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This invention relates to a liquid dispenser, and more particularly to dispensing means for liquid soap and similar products.

In the dispensing of liquid soap which is maintained under pressure, a major problem has been to prevent the seepage of the material past the valves and into the discharge passage. Fluctuations in pressure tend to increase this tendency for seepage and result in wastage of the dispensing material.

An object of the invention is to provide a simple dispenser structure which will prevent the seepage of material into the discharge port and which will respond to increases in pressure by sealing the passage only the more tightly. A further object is to provide a structure wherein the stroke of the plunger in dispensing automatically unseats the sealing valve and permits a flow into the trap chamber for the effective discharge of a measured amount of material. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated in a preferred embodiment, by the accompanying drawing, in which—

Figure 1 is a longitudinal sectional view of a dispenser structure embodying my invention, the anti-leak valve being shown in sealing position; Fig. 2, a view similar to Fig. 1 but showing the anti-leak valve unseated by the downward thrust of the plunger; Fig. 3, a transverse sectional view, the section being taken as indicated at line 3 of Fig. 2; and Fig. 4, a transverse sectional view, the section being taken as indicated at line 4 of Fig. 2.

In the illustration given, 10 designates a casing which provides a reservoir chamber 11 at the inner portion thereof and which is equipped with a threaded extension 12 adapted to engage a fitting with which the liquid supply is in communication. The lower end of the reservoir is tapped at 13 to receive a fitting 14 having a longitudinal flow passage 15 therethrough which will communicate with the flow line from the source of supply. The member 14 provides at its upper end an arcuate valve seat 16 upon which rests the ball 17. At the opposite end of the reservoir chamber is another valve seat 18 which is controlled by the ball 19. A spring 20 extends between the two balls 17 and 19.

The casing 10 provides also a trap chamber 21 in which is mounted a plunger 22. A passage 23 provides communication between the reservoir chamber 20 and the trap chamber 21. The plunger 22 is mounted for sliding movement in

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the recess 21 which forms, in its lower portion, a trap chamber for the discharge of fluid. As shown in the drawing, the plunger is provided on its inner side with a sleeve 24 enclosing a coil spring 25 which normally urges the plunger 22 into raised position. Plunger 22 is provided with a valve chamber 26 and an outlet passage 27. The outlet passage 27 communicates with a threaded fitting 28 which engages the plunger 22 and has a discharge passage 29 communicating with passage 27. Closing the lower portion of the valve chamber 26 is a plug 30 which threadedly engages the plunger 22. The plug 30 is provided with a discharge passage 31 which extends centrally through the plug and then merges with a transverse passage 32. At the top of plug 30 is a valve seat 33 in which normally rests a ball 34. A spring 35 urges the ball 34 toward the valve seat 33. The plug 30 is provided at its lower end with a pin 36 which extends into passage 23.

*Operation*

In the operation of the device, the casing structure 10 is secured within a threaded recess in a supply line so as to bring the inlet passage 15 into alignment with a source of supply of liquid soap or other material which is maintained under a pressure head. The pressure of the liquid will cause it to seep around the ball valve 17 and into the chamber 11, but the upper ball 19, by reason of the increased pressure, maintains itself tightly within the seat 18 and seals off flow into the trap chamber 21. The greater the pressure, the tighter is the closure sealed and no material escapes past the ball 19 toward discharge passages of the structure. When soap or other liquid is desired, the plunger is given a downward or initial stroke so as to move the plug 30 to the lowermost position illustrated in Fig. 2. In this operation, the fitting 28 moves with the plunger through the slotway 22a in the casing 10. The pin 36 unseats the valve 19, and the additional pressure thus produced is transmitted through the spring 20 to the lower valve 17 which is urged into tight sealing relation with its seat. The compression stroke produced through the downward movement of the plug 30 causes liquid within the trap chamber 21, as well as some liquid from the reservoir chamber, to flow upwardly and out of the trap chamber through lines 32 and 31, through valve seat 33 and the valve chamber therewith, and thence outwardly through passages 27 and 29. The pressure created by the downward stroke unseats valve 33 and allows the

liquid to pass upwardly into the discharge passages. When plunger 22 is released, it swings back to the position shown in Fig. 1 under the influence of spring 25, and in the withdrawal movement liquid flows from the reservoir chamber into the trap chamber, and further liquid flows through passage 15 into the reservoir chamber. Upon the receding of valve 19 when the plug 30 has reached the position shown in Fig. 1, further movement of the liquid toward the trap chamber is prevented, and no matter how much liquid may seep by the ball valve 17, the liquid cannot escape into the trap chamber.

While in the foregoing specification I have set out specific details as illustrating one mode of operation and one embodiment of the new structure, it will be understood that such details may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In a liquid dispenser, a casing providing a reservoir chamber with valve seats in the upper and lower ends and an inlet to the chamber, a trap chamber, and a passage connecting the chambers, a plunger in said trap chamber, spring means maintaining said plunger normally in raised position, said plunger being provided with a passage therethrough and a valve seat in said passage, balls in each of said valve seats, a compression spring extending between the balls in said reservoir chamber, and a pin carried by said plunger for pressing the ball in the upper end of said reservoir chamber downwardly toward the ball in the inlet end to seat the latter in its valve seat when said plunger is pressed downwardly.

2. In a liquid dispenser, a casing providing a reservoir chamber, a trap chamber, an inlet passage to said reservoir chamber and a passage connecting the reservoir and trap chambers, said casing also providing valve seats at the inlet and outlet ends of said reservoir chamber, balls in said seats, a compression spring between each of said balls and normally urging said balls towards said seats, and a plunger in said trap chamber provided with an outlet passage therethrough, said plunger having a pin extending into said passage between said chambers and adapted to press the ball in the outlet end of said reservoir chamber against the spring thereof to seat the ball in the inlet end of said reservoir chamber during the inward stroke of said plunger.



3. In a liquid dispenser, a casing providing a reservoir chamber, a trap chamber, an inlet passage to said reservoir chamber and a passage connecting the two chambers, said casing also providing valve seats at the inlet and outlet ends of said reservoir chamber, balls in said seats, a compression spring between said balls and urging said balls towards said seats, said inlet ball, however, permitting the seeping of liquid around the same to enter said reservoir chamber, a plunger in said trap chamber provided with a passage therethrough, and a pin carried by said plunger and extending into the passage between said chambers, said plunger when moved inwardly to force liquid from said trap chamber outwardly through the passage in said plunger, also pressing the pin thereof against the outlet ball of said reservoir chamber whereby the inlet ball is urged by the compression spring against its seat to seal the reservoir chamber against the inflow of liquid during said dispensing stroke.

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