May 19, 1942. A. L. BOBRICK 2,283,529

DISPENSER FOR LIQUID SOAP AND THE LIKE

Filed Dec. 27, 1938

FIG. 1.

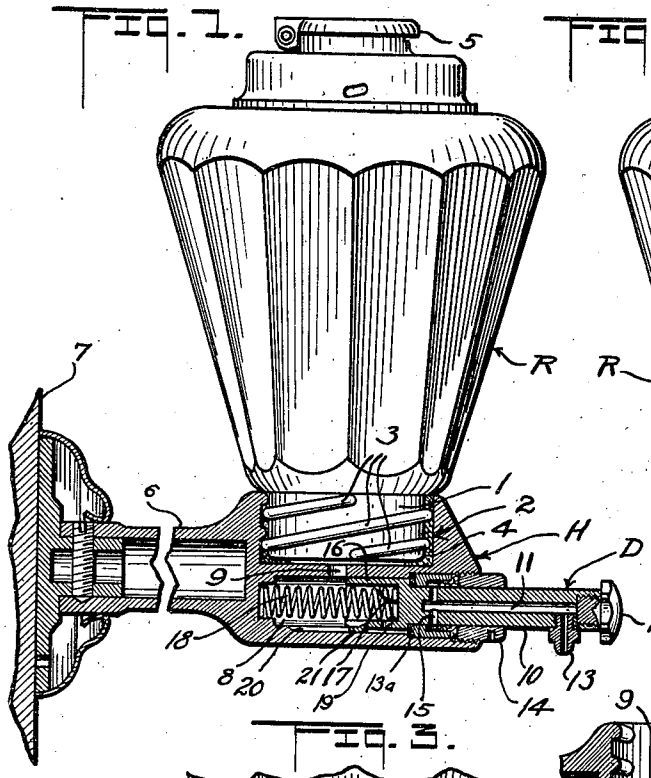


FIG. 2.

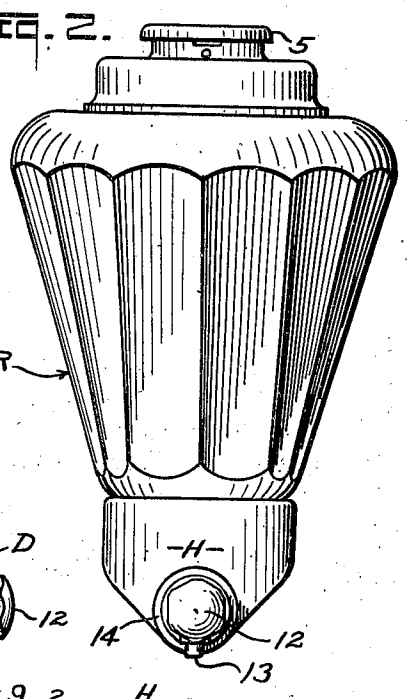


FIG. 3.

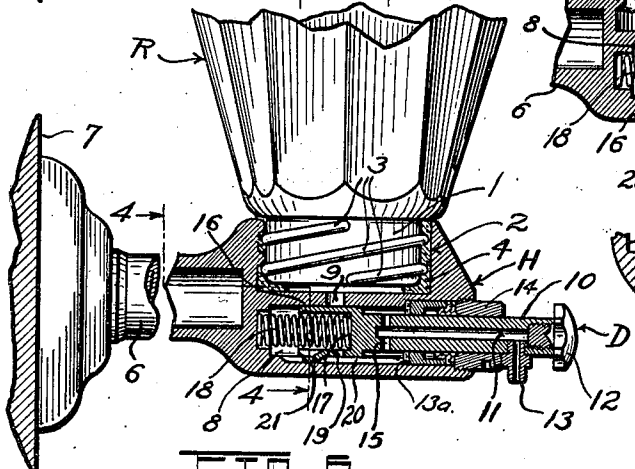


FIG. 5.

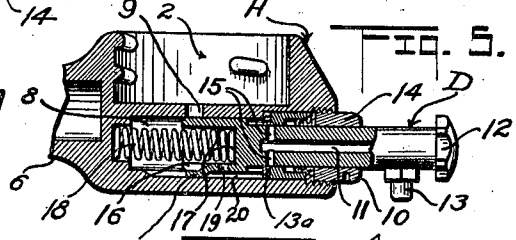


FIG. 4.

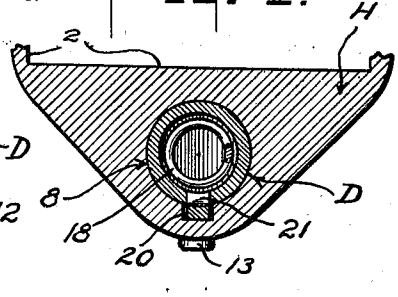
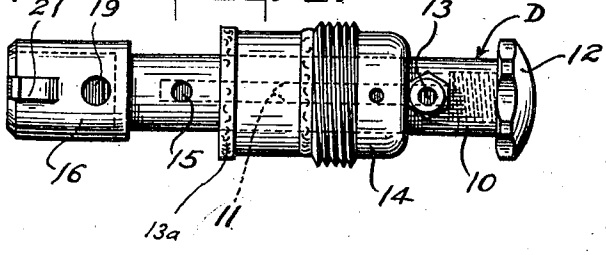


FIG. 6.



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DISPENSER FOR LIQUID SOAP AND THE LIKE

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Application December 27, 1938, Serial No. 247,807

3 Claims. (Cl. 221—102)

This invention comprehends the provision of a dispenser for liquid soaps or the like which includes a receptacle for the soap, a holder for said receptacle and manually operable means for dispensing the soap in suitable quantities at each operation of the dispenser.

More particularly the invention resides in the provision of an improved dispensing means which includes a pump mounted adjacent the soap receptacle, and preferably embodied in the holder therefor and operable whereby measured quantities of liquid soap may be dispensed.

An important object of this invention is to provide a dispensing device or pump which includes a cylinder or chamber formed in the holder and in communication with the receptacle, a plunger reciprocable in said cylinder and provided with a dispensing passage and an outlet, means for providing communication between said receptacle and said outlet when said plunger is operated to a predetermined extent, and a means operating upon the return stroke of the plunger to create a vacuum for withdrawing residual soap from said passage and outlet to thereby eliminate dripping and prevent the residual soap from clogging said passage and outlet.

It is an object, also, to provide a liquid soap dispenser with a minimum of parts, simple of design and which is not subject to damage to the parts or impairment of operation. Other and more detailed objects of invention will appear as the description progresses.

In the accompanying drawing I have shown a preferred form of dispenser, subject to modification within the scope of the appended claims, without departing from the spirit of my invention.

In said drawing:

Fig. 1 is an elevation, partly in section, in which the dispenser is shown in normally inoperative position;

Fig. 2 is an elevation of the same as viewed to right angles to Fig. 1;

Fig. 3 is an elevation of the dispenser, partly in section, showing the valve at the end of the dispensing stroke;

Fig. 4 is a transverse section of the dispenser on the line 4—4 of Fig. 3;

Fig. 5 is a sectional elevation of the dispenser, similar to Figs. 1 and 3, with the receptacle omitted and showing the dispenser in an intermediate position; and

Fig. 6 is a plan view of the dispensing plunger when removed from the holder.

My improvements include a usual receptacle R which has a reduced neck 1 adapted to be suitably secured in leak-proof engagement with a socket 2 of a holder H, as by means, for instance, of threads or ribs 3 on the extension or neck 1, and a cement or sealing element 4. Receptacle R usually has a filling cap 5 at its top for the purpose of supplying quantities of liquid soap when and as needed in the operation of the dispenser.

Holder H has an extension 6 by means of which the dispenser may be suitably attached to a supporting element, as for instance, a wall 7, said supporting means not being material to this invention. A cylinder or chamber 8 is provided in the lower portion of holder H which communicates with the interior of receptacle R by means of a port 9, and a dispenser member in the form of a plunger, as shown, but not necessarily so, as at D is mounted in said cylinder for the purpose of dispensing measured quantities of liquid soap at each operation thereof.

Said plunger is provided with a stem 10 having a bore 11 therein which is closed at the outer end of the plunger by a cap 12 and has an outlet 13 located near the outer end of the plunger thru which liquid soap is adapted to be dispensed, as hereinatfer explained. Stem 10 is slidable in a bushing 14 which is held in an end of holder H, as shown, particularly in Figs. 1, 3 and 4. The inner extremity of bore 11 communicates with a diametrical passage 15 which, when the plunger D is moved inwardly to a predetermined point, communicates with the cylinder 8.

The inner end 16 of said plunger is slightly enlarged, in practice, so as to abut the washer 13a held in place by the bushing 14, and thus prevent the liquid from escaping and also to limit the outward thrust of the plunger. The end 16 of said plunger also has a recess 17 for receiving and holding the outer end of a compression spring 18 while the inner end of said spring engages the inner end of cylinder 8 and thus serves to constantly urge the plunger outwardly to normally inoperative position. A port 19 is provided in said plunger for affording communication between the interior of cylinder 8 and a groove 20 formed in the bottom of holder H. Thus, when the plunger D is thrust inwardly as in a dispensing operation, liquid soap from receptacle R and cylinder 8 will be forced through port 19, groove 20, passage 15 in plunger D and bore 11 outwardly through outlet 13 upon or into the hand of an operator.

It will be noted that a portion of the inner end of plunger D is bent downwardly, as at 21, so as to slidably engage groove 20, thereby preventing the rotation of the plunger in its cylinder 8. Said groove 20, in addition to serving as a keyway for the portion 21 of the plunger, also serves as a means of communication between cylinder 8 and bore 11 of the plunger. Thus, in the manner hereinafter described, the dispensing plunger is effective for dispensing predetermined quantities of liquid soap from receptacle R, it being apparent that upon each

inward thrust of plunger D the contents of cylinder 8 will be forced outwardly from cylinder 8 into and from plunger D, and upon retraction of said plunger the vacuum created in cylinder 8 will serve to evacuate bore 11 and associated passages of whatever amount of soap may be left therein.

The dispenser of my invention, as hereinbefore described, operates as follows:

When the receptacle R containing a supply of liquid soap is mounted in the holder H as shown in Figure 1, the soap will run through the port 9 into the chamber 8 due to the fact that the spring 18 normally holds the plunger D extended whereby said port 9 is uncovered. The plunger now presses against the washer 13 and seals the dispenser against leakage and in view of the fact that the ports 15 are out of registration with the passage 20 no soap can enter the passage 11 and escape through the outlet 13. When the plunger is pushed inwardly, the definite amount of soap contained in cylinder 8 is trapped therein due to the fact that the initial movement of the plunger closes port 9 which remains closed until the plunger is released and assumes the position shown in Figure 1. Thus, inward movement of the plunger causes this trapped soap to be forced out through port 19, passage or keyway 20, ports 15, bore 11, and outlet 13. It should be noted that the ports 15 do not move past the washer 13 and come into registration with the groove 20 until the portion 15 has completely closed the port 9. It is thus seen that the plunger can not be manipulated to a position which will allow soap to run freely from the receptacle R out through the outlet 13.

When pressure upon the plunger is released the tension of spring 18 operates to retract the plunger D to the position shown in Fig. 1, and creates a partial vacuum in the inner end of cylinder 8 which is effective for scavenging and evacuating the bore 11 and passages 15 and 19 of any accumulation of soap therein. The outlet 13 being movable with the plunger is desirable for the reason that the plunger may be so held in the hand of an operator that the hand, traveling with the plunger, will receive the dispensed quantity of soap.

It is important, therefore, that the soap is dispensed through and from the dispensing plunger rather than from the cylinder 8 directly or from any other pocket or recess. Moreover, the closing of the part between receptacle R and cylinder 8 prevents an over supply of soap at any operation of the device. It is quite apparent that the structure and arrangement shown and described permits of the ready removal of the dispensing plunger by merely removing the bushing 14. Thus, the apparatus may be easily and quickly cleaned and worn or damaged parts replaced with facility. It is emphasized that, in the operation of my mechanism, it is necessary and desirable to arrange the plunger D so that the port 9 will be closed before the ports 15 are opened, that is, by moving inwardly into communication with groove 20, so as to assure the prevention of more than a normal and predetermined quantity of soap being dispensed at a single operation. Other advantages will readily appear to those familiar with the operation and use of dispensers of liquids. Of course, I do not limit this invention to the purpose of dispensing liquid soap, for it is apparent that other liquids may be also dispensed therefrom.

What I claim is:

1. In a liquid dispenser, a cylinder having a liquid intake port, a plunger reciprocable in said cylinder, a spring operative to normally hold said plunger extended, said plunger having an inlet normally disposed out of communication with the liquid containing portion of said cylinder and adapted to be brought into communication with said portion of said cylinder when said plunger is operated a predetermined extent, said plunger also having a liquid dispensing outlet and a passage extending between the inlet and outlet thereof, and means operative on the working stroke of the plunger for closing said intake port and forcing liquid from said cylinder thru said passage and outlet, and operating on the return stroke of the plunger to create a vacuum for withdrawing residual liquid from said passage into said cylinder.

2. In a liquid dispenser, a cylinder having a liquid intake port, a plunger reciprocable in said cylinder, a spring operative to normally hold said plunger extended, said plunger having an inlet normally disposed out of communication with the liquid containing portion of said cylinder and adapted to be brought into communication with said portion of said cylinder when said plunger is operated a predetermined extent, said plunger also having a liquid dispensing outlet and a passage extending between the inlet and outlet thereof, and means operative on the working stroke of the plunger for closing said intake port and forcing a liquid from said cylinder thru said passage and outlet, and operating on the return stroke of the plunger to create a vacuum for withdrawing residual liquid from said passage into said cylinder, said means including a hollow piston portion on the inner end of said plunger, said cylinder having a groove therein, a key portion on said piston portion engaging in said groove, said piston portion having a port therein for affording communication of the liquid containing portion of the cylinder with said groove.

3. In a liquid dispenser, a cylinder having a liquid intake port, a plunger reciprocable in said cylinder, a spring operative to normally hold said plunger extended, said plunger having an inlet normally disposed out of communication with the liquid containing portion of said cylinder and adapted to be brought into communication with said portion of said cylinder when said plunger is operated a predetermined extent, said plunger also having a liquid dispensing outlet and a passage extending between the inlet and outlet thereof, and means operative on the working stroke of the plunger for closing said intake port and forcing a liquid from said cylinder thru said passage and outlet, and operating on the return stroke of the plunger to create a vacuum for withdrawing residual liquid from said passage into said cylinder, said means including a hollow piston portion on the inner end of said plunger, said cylinder having a groove therein, a key portion on said piston portion engaging in said groove, said piston portion having a port therein for affording communication of the liquid containing portion of the cylinder with said groove, said plunger inlet being adapted to communicate with said liquid containing portion through said groove and the port in said piston, said spring having one end seated in said hollow piston portion.

ARTHUR L. BOBRICK.