

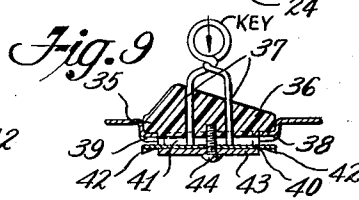
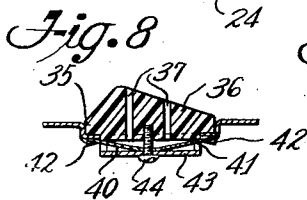
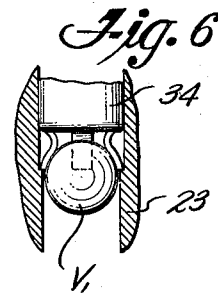
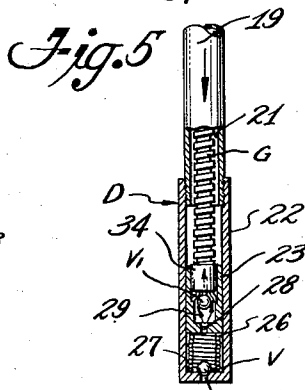
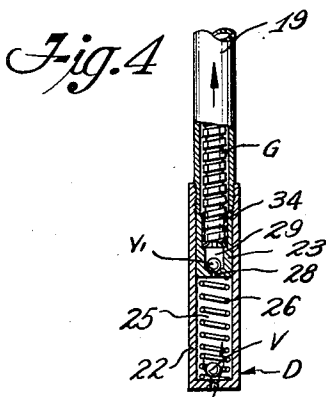
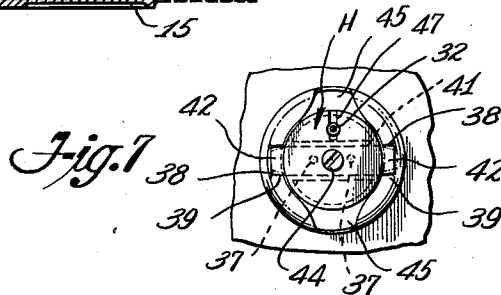
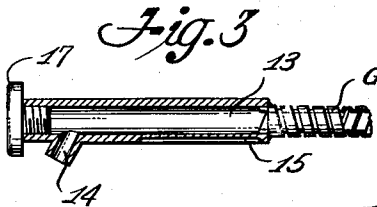
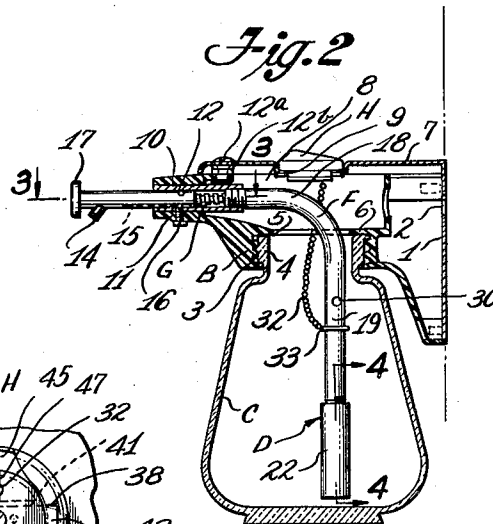
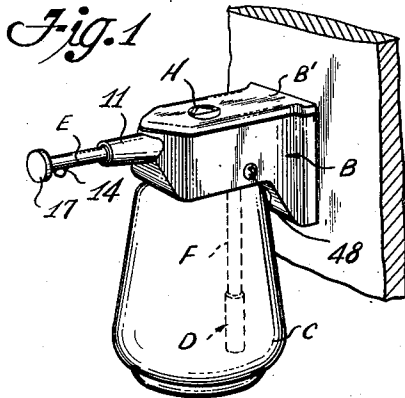
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2,545,988

LIQUID DISPENSER

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LIQUID DISPENSER

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7 Claims. (Cl. 222-341)

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This invention relates to and has for an object the provision of an improved liquid dispenser for liquids such as liquid soap, glycerine, hand lotion, etc., embodying a suitable container, a base for supporting the container and a novel dispensing mechanism carried by the base and having parts extended into the container so that when the dispenser is manually operated, a quantity of liquid soap or the like will be ejected for use upon each operation thereof.

In more detail, other objects include: the elimination of gaskets and washers which are usually employed to seal the mechanism against leakage of liquid; the employment of an encased flexible outlet tube which connects the operating plunger and an outlet valve and is bodily movable with said plunger in an ejecting operation; the provision of dual control valves submerged in the liquid and reversely operative for regulating the charging of the outlet tube with liquid and the discharge of the same for use under the influence of the operating plunger; the provision of a novel and effective container closure so arranged as to be unopenable except by special means and so attached to the dispenser as to prevent loss or detachment when opened; and various other structural details affording pleasing appearance, convenient and expeditious assembly and disassembly and maintenance, economy in original cost and up-keep, durability and sturdiness, all of which will be hereinafter explained in detail.

I have shown a preferred embodiment of my invention in the annexed drawing, subject, however, to modifications, within the scope of the appended claims, without departing from the invention.

In said drawing:

Fig. 1 is a perspective view of the assembled container in position on a wall;

Fig. 2 is a central vertical section, to a larger scale, through the container shown in Fig. 1.

Fig. 3 is a cross section to an enlarged scale on the line 3-3 of Fig. 2;

Fig. 4 is a fragmentary detail view in central vertical section through the pump chamber of the dispenser showing the position of the valves during the outward movement of the operating plunger;

Fig. 5 is a similar view to Fig. 4 showing the position of the valves during the inward movement of the operating plunger;

Fig. 6 is a fragmentary view to an enlarged scale showing a ball valve check provided at the foot of the discharge tube;

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Fig. 7 is a bottom plan view of a refilling closure;

Fig. 8 is a cross section on the line 8-8 of Fig. 7 showing the closure in the locked position;

Fig. 9 is a similar section to Fig. 8 but showing the closure in the unlocked position.

Generally, the dispenser of my invention includes a base B, a container C for holding a quantity of liquid and preferably detachably supported on base B, a pump and control valve mechanism D adapted to be submerged in the liquid held in container C, an operating plunger E telescopically mounted in base B, a tubular guide F and a flexible discharge tube G connecting the plunger with pump D.

Base B is formed of metal or plastic and has a wall 1 adapted to abut and be secured to a suitable supporting surface as by means of screws (not shown) inserted in holes 2, so that the base will be held in extended horizontal position and at a right angle relative to its supporting surface.

Base B has a circular neck 3 which is internally threaded to receive an externally threaded neck 4 of container C and thereby detachably support the container on the base, there being an orifice 5 in a bottom wall 6 of the base for affording access to the container when the same is mounted on the base. The top 7 of the base is formed with an internal flange 8 of L cross section and a filling opening 9. Said flange forms a recess on the top for receiving a closure H which will be hereinafter described in more detail. Said closure is located immediately over opening 5 of the container so that the container may be readily filled with liquid soap without detachment from the base.

The base is preferably formed of two mating sections B and B', of cast and stamped metal, respectively, or of plastic and otherwise formed as may be best adapted for use. However, herein the base will be considered as an integral structure inasmuch as the specific form of base is not material to the invention.

Operating plunger E is slidably mounted in a bore 10 of a boss 11 extended from the base and carrying a bushing 12 which forms a guide and bearing for the plunger. An outlet passage 13, Fig. 3, is formed in the plunger and is open at the inner end of the plunger and leads outwardly to a spout 14 through which the liquid soap is discharged for use. Plunger E has a longitudinal keyway 15 cut therein which is engaged by the inner end of a guide screw 16 for preventing rotation of the plunger in its bushing 12 while

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permitting longitudinal movement of the plunger in a dispensing operation. The keyway 15 is not cut through to the inward end of plunger E so that guide screw 16 is also effective, when screwed in, to prevent the plunger from being withdrawn from boss 11. A finger piece 17 having a concave outer surface is formed integral with or suitably affixed to the outer end of the plunger, the concave outer surface of the finger piece usually serving to prevent displacement of the finger of an operator. Portion B' of the base is secured thereto by screw 12a engaging in a threaded bushing 12b riveted into the inner end of the boss 11.

The tubular guide F has its upper portion 18 bent through a 90° radius to its lower and vertical portion 19 with the end of portion 18 suitably secured to the inner end of bushing 12.

The flexible dispensing tube G is mounted within the guide tube F and has its upper end suitably affixed to the rear end of the plunger so that the passage through the tube will be in constant communication with passage 13 in the plunger.

The lower end of portion 19 of guide tube F is fixed to the cylindrical housing 22 of the pump and control valve mechanism D while the lower end of tube G is affixed to a hollow piston 23 which is reciprocally mounted in housing 22. The housing 22 has an orifice 24 at its bottom adapted at times to be closed by a ball foot valve V and when the valve is open to afford communication between the interior of container C and the interior 25 of housing 22 below piston 23. A spring 26 is compressed between the bottom of piston 23 and the bottom 27 of housing 22 and serves to urge piston 23 and tube G upwardly and plunger E outwardly to normally non-dispensing position.

Piston 23 has an orifice 28 in its bottom adapted at times to be closed by a ball check valve V' and when open to permit liquid from the interior 25 to flow upwardly into a chamber 29 in the piston and thence through the tube G to, through and from passage 13 of the plunger.

Thus, upon each inward thrust of plunger E, tube G and piston 23 will be thrust downwardly against the tension of spring 26 and the liquid contents of valve chamber 25, thereby closing valve V and opening valve V' so that liquid from chamber 25 will flow upwardly past valve V' into and through tube G and thence through passage 13 and outwardly through spout 14 for use. When inward pressure on the plunger is relieved, spring 26 is effective for restoring the plunger, piston 23 and tube G to normally inoperative positions and valve V is opened for recharging chamber 25 with liquid preparatory to a succeeding operation of the plunger.

It may be understood that the liquid leaking into the guide tube F will always be at the level of liquid in the container C and will never rise to a point where it may reach the rear of the plunger. Hence, there can be no occasion for packing the plunger in its bearing 12 or leakage around the plunger. Space 21 between the guide tube and flexible discharge tube is in constant communication with the interior of the container C by means of peripheral orifices 30 and any air or liquid in casing F between the plunger and piston will be expelled through the orifices 30 into the container upon the outward thrusts of the plunger.

A suitable gasket or washer may be held be-

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tween the lip of the container and wall 6 of the base if desired or necessary.

Closure H may be attached to the dispenser as by means of a chain, wire or cord 32 of suitable length to permit the removal of the closure from closed position, but preventing complete detachment of the closure from the dispenser. To such end, the upper end of chain 32 may be fixed to a portion of the closure and the lower end thereof formed or provided with a ring or loop 33 extended around casing F or a suitable portion of the base.

The dispensing mechanism is so arranged that the bottom of valve housing D is very close to the bottom of container C in order that the mechanism will be operative for dispensing the liquid when at a minimum level without impairing the efficiency of the dispenser when the liquid in the container is almost exhausted.

It is desirable to arrange the connection between tube G and the piston 23 so that they may be readily separated for cleaning purposes and this is provided for by forming an inside, taper flaring outwardly and upwardly, in piston 23 and surrounding the lower end of tube G with a piece of tightly stretched rubber or synthetic tube 34. When tube G is pushed into piston 23, the piston will be held with sufficient firmness to function satisfactorily while by slacking back set screw 16, the plunger and attached tube G may be readily pulled through the guide tube and the finger piece unscrewed; after which the tube may be cleaned by passing a wire through the plunger and flexible tube. The piston is limited in its upward movement by lower end of the guide tube screwed into housing D and so cannot be pulled out of the housing D.

Tube G may be re-engaged with piston 23 by pushing the plunger in until spring 26 is fully compressed, enabling the rubber covered end of the tube to be pushed into firm engagement with the tapered seat in piston 23, after which set screw 16 is again entered in the slot in the plunger, the spring thereafter aiding in retaining the piston on the end of tube G and the plunger in extended position.

The closure H is particularly designed to prevent its removal by unauthorized persons, since a key of the shape indicated in dotted lines is required to remove it.

The closure comprises a disc 35 of metal or plastic having a raised rib 36 in which a pair of spaced vertical holes 37 are provided passing completely through the disc 35. The flange formed in the part B' of the base around the filling-opening is formed to provide a pair of diametrically spaced notches 38, the flange being formed with inclined portions 39 extending from the normal bottom line of the flange to shoulders forming the side walls of the notches. A strip of springy metal 40 is positioned in a groove 41 across the bottom face of the closure, the ends 42 of the strip projecting outwardly from the closure and being upwardly bent to press against the under face of the flange when cover plate 43 is put in place by a screw 44 passing through the center of the plate and a hole in the center of the spring and engaging in a tapped hole in the disc.

The inwardly projecting angle of the flange is cut away at diametrically spaced points 45.

When placing the closure in position, the projecting ends of the spring strip are passed through the cut away portions of the flange. The closure is then turned by means of the projecting ridge,

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the ends of the spring strip riding down the inclined portions 39 until they snap into the notches 38 after which the closure cannot be removed until the prongs of the key are inserted in the holes to press the ends of the spring strips downwardly out of the notches enabling the closure to be turned to bring the ends into the cut away portion of the flange, enabling the closure to be lifted out. A length of ball chain or other flexible member is secured to the closure by passing the wire to the end ball into a slot 47 before the plate 43 is put in place, the other end of the chain being hooked around the guide tube F, as indicated at 33.

The container C is preferably held in the base by means of a screw 48 projecting into engagement with an interrupted portion of the thread on the neck 3 of the container, thus the screw 48 has to be slacked back before the container C can be unscrewed.

I claim:

1. A liquid dispenser including: a liquid container: a base to which said container is secured and having a laterally projecting tubular portion; a tubular member extending from the tubular portion of the base toward the bottom of the container; a pump barrel connected to the lower end of said tubular member; a hollow piston mounted in said pump barrel; check valves mounted in said pump barrel and tubular piston; a tubular operating plunger secured in the laterally projecting tubular portion of the base for sliding movement therein, releasable means effective to limit the outward movement of the plunger; a flexible tube forming an extension of the plunger and push fitted at its lower end into the piston; and a spring arranged under tension between the bottom of the pump barrel and the piston therein, the arrangement being such that by releasing the means limiting outward movement of the plunger, the latter together with the flexible tubular extension may be withdrawn from the dispenser for cleaning.

2. A liquid dispenser including: a liquid container; a base to which said container is secured and having a laterally projecting tubular portion; a tubular member extending from the tubular portion of the base toward the bottom of the container; a pump barrel connected to the lower end of said tubular member; a hollow piston mounted in said pump barrel; a delivery member having a tubular operating plunger mounted for sliding movement in the base and a flexible tube forming an extension of the plunger connected at its lower end to the piston; a check valve in said pump barrel and a second check valve mounted in said delivery member and opening in the same direction as said first valve; and a spring arranged under tension between the bottom of the pump barrel and the piston therein; and means limiting the outward movement of the plunger from the base under the effort of the spring.

3. A liquid dispenser comprising a container, an operating plunger slidably mounted thereon, a tubular guide fixed to said container and bent to provide a portion at one end in alinement with

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said plunger and having a relatively angular inner portion adapted to be submerged in the contents of the container, a metallic flexible tubular extension secured to said plunger and conformable to and extended into said guide, a barrel fixed to the inner end of said guide, a piston fixed to the inner end of said tubular extension and slidable in said barrel, and valve means within said barrel for affecting the discharge of liquid from the barrel through the piston and said flexible extension and said plunger upon each inward thrust of the plunger and for recharging the barrel upon a reverse thrust of the plunger preparatory to the succeeding operation.

4. A liquid dispenser as characterized in claim 3 in which said tubular guide is constantly in communication with the container between the piston and the plunger.

5. A liquid dispenser as characterized in claim 3 in which said tubular guide is constantly in communication with the container between the piston and the plunger, while the piston and flexible extension are only open to communication with the barrel upon an operating thrust of the plunger.

6. A liquid dispenser as characterized in claim 3 in which said tubular guide is constantly in communication with the container between the piston and the plunger, said barrel being open to communication with the container only upon a retractive thrust of the plunger.

7. In a liquid dispenser having a base, a container mounted thereon and a plunger for dispensing the contents of the container: a tubular guide having relatively right angularly disposed straight portions and an intermediate bent portion, one of said straight portions being aligned with the plunger and secured to the base and the other straight portion adapted to be submerged in the contents of the container, a barrel secured to the submergible end of said guide, a flexible tubular extension secured at an end to said plunger and extending into and conformable to the curvature of said guide and thence into said barrel, a piston secured to the inner end of said flexible extension and valve means borne by said piston and said barrel for admitting charges of liquid from the container into said barrel upon the upward thrust of said piston and for discharging the contents of the barrel through said piston, said flexible extension and said plunger upon each downward thrust of the piston.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,118,977	Watrous	Dec. 1, 1914
1,290,435	Watrous	Jan. 7, 1919
1,362,077	Bobrick	Dec. 14, 1920
1,396,469	Steele	Nov. 8, 1921
2,395,840	Blankenship	Mar. 5, 1946