

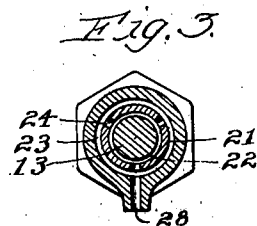
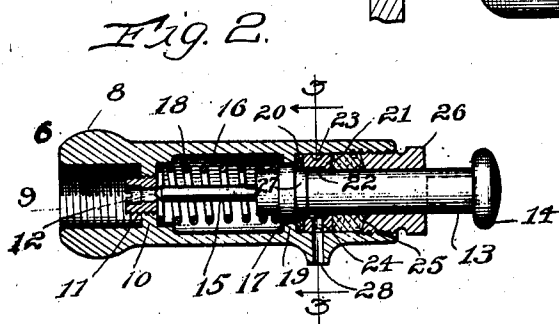
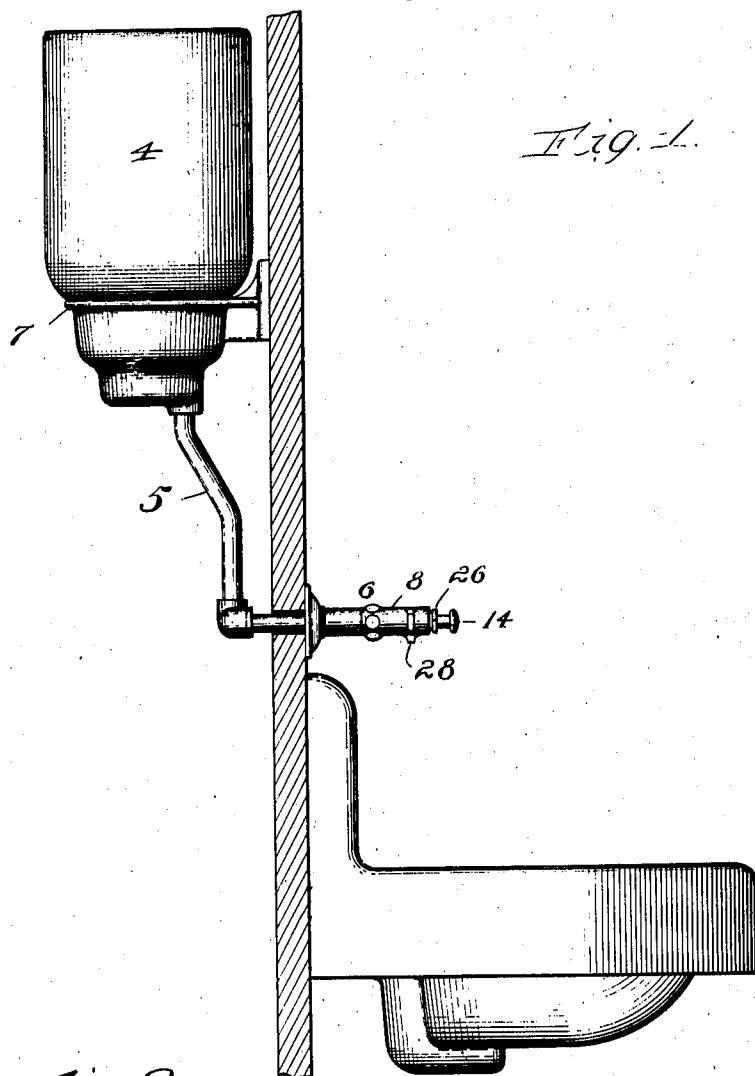
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E. G. WATROUS

LIQUID SOAP PUMP

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LIQUID-SOAP PUMP.

Application filed April 25, 1918. Serial No. 230,662.

To all whom it may concern:

Be it known that I, EARL G. WATROUS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Liquid-Soap Pumps, of which the following is a specification.

This invention relates more particularly to an apparatus for delivering or dispensing measured, or predetermined amounts, of fluids such as liquid soap or other viscous liquids. The pump which forms the principal feature of this invention is of the displacement type, and is constructed in a novel manner so as to perform such particular operations as are desirable in pumping liquid soap or the like.

The objects of this invention are to provide an improved apparatus for pumping or dispensing liquids; to provide a novel apparatus for dispensing measured quantities of liquid soap; to provide a pump of simple construction which will be efficient and durable in operation and which will tend to clean itself even when pumping or dispensing viscous liquids; and in general to provide such an improved apparatus as will be more fully described hereinafter.

In the accompanying drawings illustrating this invention:

Fig. 1 is a side view of one form of my improved apparatus shown in position above a wash bowl;

Fig. 2 is a longitudinal sectional view of the pump; and,

Fig. 3 is a cross sectional view taken on the line 3—3 of Fig. 2.

Various forms of pumps or valves have heretofore been proposed for use in dispensing liquid soap, but such devices have not generally been satisfactory on account of the peculiar nature of the liquid. If the soap is exposed to the air for any considerable length of time, it is apt to evaporate and leave a more or less solid residue which will frequently plug up or stop the discharge openings and prevent the further operation of the device. In order to avoid these objections, I provide the novel form of pump as shown in the drawings.

As illustrated in these drawings, 4 represents a receptacle or container for liquid soap or the like, which is connected by means of a pipe 5, with the pump 6. The container 4 may be made in any suitable form, and as shown, is supported by a wall bracket 7. A

single receptacle may be utilized for supplying one pump, or a number of pipes may lead from one receptacle to a plurality of pumps.

The pump proper comprises a cylindrical body or barrel 8 which is threaded at one end 9 for engagement with the connecting pipe. The body 8 has a reduced portion or partition 10 adjacent to the inner end which is threaded to receive an adjustable bushing 11 having a hole or passage-way 12 there-through. This adjustment is employed to compensate for variations in manufacture. The plunger 13 which extends out at the open end of the body, is provided with a detachable handle or push button 14 for operating the same. This plunger has an inwardly extending rod or stem 15 which coacts with the hole 12 and serves as a valve for cutting off the supply from the main chamber 16. The plunger or piston 13 has an annular projection or collar 17 which serves as an abutment for a spring 18, the opposite end of said spring engaging with the partition 10. This spring serves to hold the plunger 13 in normal or closed position as indicated in Fig. 2. The body or cylinder 8 has a second reduced portion 19 having an opening therethrough which closely fits the collar 17. The projection or collar 17 strikes against a washer 20 which is preferably made of felt or other yielding material. This washer is held between the annular flange or projection 19 and a ring 21 which fits closely within the outer portion of the cylinder or barrel 8, and also engages closely with the plunger 13. This ring has an inner annular enlargement or opening 22 and an outer circumferential groove or channel 23, these grooves being connected by radial holes or openings 24. The ring 21 is held in position by packing 25 and a gland or bushing 26. The plunger 13 is slightly enlarged at 27 where it engages with the yielding washer 20, so that this washer is not apt to be pressed inwardly so as to close the opening 22.

The body or cylinder 8 has a discharge orifice 28 which is in alinement with the groove 23, and preferably with one of the holes 24.

When there is a supply of liquid in the container 4, it will fill the chamber 16 but cannot pass the projection 17 which forms, with the adjacent parts, a complete closure. When the operator presses the handle 14,

and forces the plunger 13 inwardly, the projection or collar 17 and the enlargement 27 are disengaged from their coacting parts and leave a passageway from the chamber 16 through the opening 22, holes 24, and groove 23 to the discharge orifice 28. Just before this passageway is opened, the stem 15 engages with the hole 12 and closes the opening between the supply pipe and chamber so that there is never a through open passage-way from the supply pipe to the discharge orifice. Consequently the operator cannot hold the device open so as to permit a continuous stream to flow from the receptacle. The further movement of the plunger causes it to enter the chamber 16 and displace the liquid which is forced out through the discharge passage-way and orifice. In this manner, a measured supply of liquid is discharged, depending upon the amount of depression or movement of the plunger. As soon as the plunger is released, the spring 18 tends to force it back to normal position, but this movement is accompanied by a novel function of the apparatus. It will be seen that the opening to the supply pipe remains closed until about the end of the return stroke, so that as the plunger starts on its return, there is a tendency to form a partial vacuum in the chamber 16. Consequently the air will rush in through the discharge orifice and discharge passage-way and will thereby force any liquid remaining in said orifice or passage-way back into the chamber. This tends to clean the discharge passage-ways and prevent their becoming clogged by evaporation of the volatile portion of the soap. The intake orifice 12 will also be cleaned at each stroke of the pump by the action of the pin or stem 15 passing through the same.

It will be seen from the above description that I provide a novel dispensing or pumping apparatus which is particularly applicable for measuring and discharging soap or the like and which, on account of its self-cleansing functions, is not apt to become clogged. Furthermore, the positive action of the pump will insure the proper delivery of predetermined amounts of soap or other similar liquid.

It will be observed that changes may be made in the details of construction of this apparatus without departing from the scope of the present invention, and therefore, I do not wish to limit myself to the exact arrangement or construction herein shown and described, except as specified in the following claims in which I claim:

1. In a liquid dispensing apparatus, the combination of a pump having a body provided with a displacement chamber, a source of supply, a connection from said source of supply to said chamber, a displacement plunger of less diameter than the chamber

coacting with said chamber, the chamber having an inlet opening of less diameter than the plunger, a stem on said plunger which coacts with said opening to close the same during the discharge stroke, said body portion having a discharge orifice at the end of the chamber opposite from the intake, and a closure actuated by the plunger for closing the discharge when the plunger is in normal position.

2. In a liquid dispensing apparatus, the combination of a pump having a displacement chamber, an intake at one end of said chamber, a source of supply, a connection from said source of supply to said intake, said chamber having an inlet aperture, a pin secured to a plunger and coacting with the aperture to form a closure, a displacement plunger coacting with said chamber for forcing the liquid therefrom, said plunger being of less diameter than the chamber but of greater diameter than the pin, a discharge at the end of the chamber opposite from the intake, a closure for said discharge, said closures being actuated by the plunger and arranged so that the discharge closure will be closed when the plunger is in normal position, the intake closure being closed before the latter is opened and remaining closed during the discharge stroke of the plunger and until the discharge closure is again closed.

3. In a device of the character set forth, the combination of a body having a chamber therein, an intake orifice at one end of said chamber, a displacement plunger slidably mounted in said body and adapted to be projected into the chamber, a handle for said plunger, a spring tending to hold said plunger in normal retracted position, a stem on said plunger which is of less diameter than the plunger and which fits said intake orifice and is projected into the same when the plunger is pressed inwardly, a discharge opening for said chamber, and means on said plunger for closing the discharge opening when the plunger is in normal position.

4. The combination of a body having a chamber therein, a threaded aperture at one end of said chamber, a threaded bushing fitting in said aperture and having an intake hole therethrough, a wall at the opposite end of said chamber having an opening therein, a plunger mounted in said body and having a collar fitting in said opening, a stop for limiting the outward movement of said plunger, a spring tending to hold said plunger in normal position, and a projection from said plunger adapted to close the intake hole during the stroke of said plunger.

5. The combination of a body having a chamber therein, an intake orifice at one end of said chamber, a wall at the opposite end of said chamber having an aperture there-through, a plunger mounted in said body

and having a handle projecting therefrom, a stem on said plunger for closing the intake orifice at predetermined times, a collar on said plunger fitting the aperture through said wall, a washer fitting in the body portion adjacent to said wall and engaging with said plunger, a ring fitting in said body portion adjacent to the washer, and having inner and outer grooves connected by passage-ways, a packing and gland at the end of said body, said body having a discharge orifice communicating with the outer groove in said ring, and a spring interposed between said collar and the opposite wall of said chamber for holding said plunger in normal position.

6. In a pump, the combination of a body having a displacement chamber therein, an intake for said chamber, a valve for closing said intake at predetermined times, a plunger mounted in said body and having a collar adjacent to its inner end, said body having an inwardly projecting flange with an opening fitting said collar, a shoulder on said plunger adjacent to the collar, a washer of resilient material mounted in said body adjacent to said flange and fitting over said shoulder, a ring mounted in said body next to the washer and having an annular recess fitting over said shoulder and also having an outer circumferential groove with communications from said recess, said body having a discharge orifice communicating with said outer groove, and a packing for said plunger fitting in the outer end of the body.

7. In a pump of the character set forth, the combination of a body having a chamber therein with a relatively small intake orifice at one end, a displacement plunger coacting with said chamber and adapted to be withdrawn from said chamber to permit the chamber to be filled, said chamber having a discharge orifice which is closed when the plunger is withdrawn from the chamber, and a pin on said plunger which fits said intake orifice and closes the same when the plunger is moved into the chamber.

8. A liquid dispensing member comprising a chamber with an inlet and outlet, a

plunger movable in the chamber to close the inlet and open the outlet, the portion of the plunger which closes the inlet being smaller than the remaining portion.

9. In a soap pump, the combination of a chamber having an inlet and an outlet, a packing washer coacting with the outlet and having a hole therethrough of the same diameter as the outlet, a displacement plunger coacting with said chamber and fitting in said outlet, said plunger being somewhat smaller than the hole through the washer to provide a discharge passage but having an enlarged portion fitting in said hole when the plunger is in closed position, said plunger also having a collar or projection for engagement with the face of the washer.

10. In a soap dispenser the combination of a chamber having an inlet and an outlet, a packing washer coacting with the outlet and having a hole therethrough of the same diameter as the outlet, a displacement plunger coacting with said chamber and fitting in said outlet, said plunger embodying a cylindrical portion which fits the hole in the washer and a flange on the cylindrical portion adapted for engagement with the face of the washer, the plunger having a reduced portion to provide a discharge passage.

11. In a liquid dispensing apparatus, the combination of a pump having a body provided with a displacement chamber, a source of supply, a connection from said source of supply to said chamber, a displacement plunger of less diameter than the chamber coacting with said chamber, the chamber having an inlet opening of less diameter than the plunger, a stem on the plunger which coacts with said opening to close the same during the discharge stroke, said body portion having a discharge orifice at the end of the chamber opposite from the intake, a closure carried by the plunger for closing the discharge orifice and means for moving the plunger and closure to close the discharge orifice.

EARL G. WATROUS.