Sept. 9, 1941. J. F. PALMER 2,255,722

POWER ACTUATED SOAP DISPENSER

Filed May 5, 1939

Fig. 1.

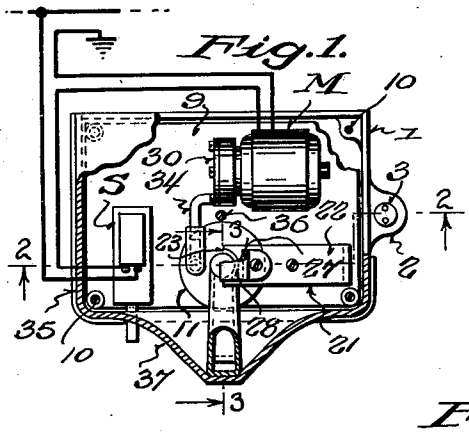


Fig. 3.

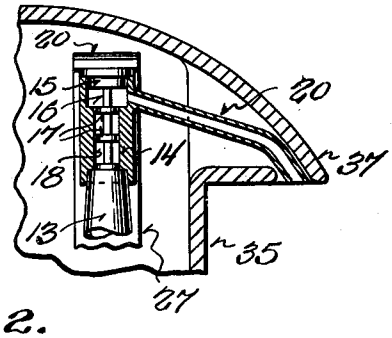


Fig. 2.

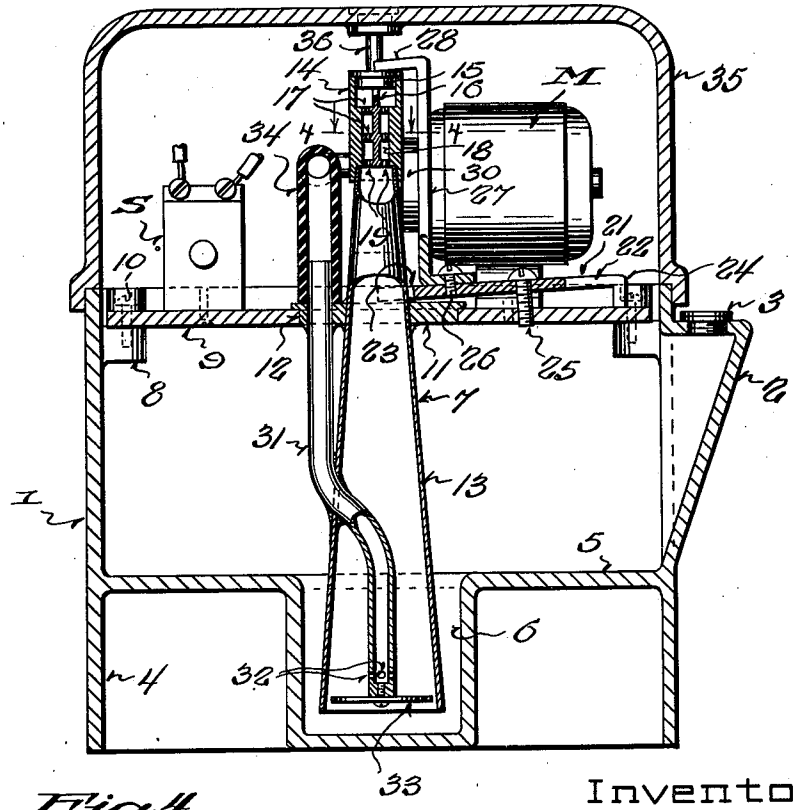
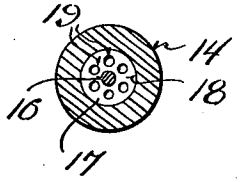


Fig. 4.



Inventor
J. F. Palmer

By

Attorneys

Patented Sept. 9, 1941 2,255,722

UNITED STATES PATENT OFFICE

2,255,722

POWER ACTUATED SOAP DISPENSER

John Frederick Palmer, Waukesha, Wis.

Application May 5, 1939, Serial No. 271,977

2 Claims. (Cl. 261—121)

The present invention relates generally to liquid soap dispensers and more particularly to a motor-operated device for dispensing liquid soap in suds form.

While the inventtion may be employed wherever it is desired to dispense liquid soap, it is particularly designed for shower rooms and baths where a large volume of soap suds is required quickly, such as in clubs, industrial plants, community centers, and public shower baths. The use of bar or cake soap in shower rooms of the foregoing character, is objectionable in that the same is carelessly thrown around, causing a hazard to the occupants, and a considerable waste of soap, in addition to creating an unsanitary condition. Therefore, while liquid soap overcomes the foregoing objections, heretofore its use has been unpractical inasmuch as conventional, manually operated dispensing devices now on the market are incapable of quickly supplying an adequate quantity of soap required to lather the body. Also, it is difficult to convey liquid soap from conventional dispensers to the body, with the result that the same flows from the palm of the hand, making the floor slippery and hazardous.

The invention has primarily for its object to meet the foregoing conditions by the provision of an exceedingly simple, and comparatively inexpensive, motor-operated dispenser of neat, attractive design for rapidly delivering substantial quantities of liquid soap in fluffy suds form, whereby the same can be quickly and conveniently applied to any part of the body without spilling.

Incidental to the foregoing, a more specific object of the invention resides in the provision of a dispenser comprising a liquid soap reservoir into which a sudsing and delivery mechanism actuated by compressed air from a motor-driven compressor extends.

Another object resides in the provision of means for confining the sudsing and delivery action of the compressed air to a limited quantity of liquid contained in the reservoir, to provide uniform quick delivery of suds upon operation of the motor, regardless of the volume of liquid contained in the reservoir.

Another object is to provide exceedingly simple means for detachably assembling and clamping the sudsing and dispensing mechanism upon the reservoir, whereby the same may be easily and quickly removed for cleaning.

A still further object resides in providing the reservoir with a sump for reception of the sudser to allow maximum withdrawal of liquid from the reservoir.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the novel method, construction, combination, and arrangement of parts, substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawing is illustrated one complete example of the physical embodiment of the present invention constructed according to the best mode so far devised for the practical application of the principles thereof.

In the drawing:

Figure 1 is a plan view of a dispenser incorporating the present invention;

Figure 2 is a vertical section taken on the line 2—2 of Figure 1;

Figure 3 is a fragmentary detail section taken on the line 3—3 of Figure 1; and

Figure 4 is a detail section through the sudsing mechanism, the same being taken on the line 4—4 of Figure 2.

Referring now more particularly to the accompanying drawing, the numeral 1 indicates a reservoir, which, for the purpose of durability, as well as sanitation, is preferably formed of cast metal provided with a vitreous or enamel finish.

The reservoir is filled through a spout 2 formed in one of its side walls and closed by a threaded cap 3. The lower end of the reservoir forms a depending skirt 4, which supports the bottom 5 of the reservoir a sufficient height to provide for a sump 6, which receives the lower end of the sudsing and dispensing mechanism, designated generally by the numeral 7.

The interior of the reservoir 1 is provided adjacent its upper edge with spaced lugs 8 for reception of a plate 9 attached to the lugs by screws 10, a slight clearance being provided between the edges of the plate and the walls of the reservoir to maintain atmospheric pressure with the reservoir.

The sudsing and dispensing mechanism 7 comprises a flanged cap 11 supported upon the plate 9 and forming a closure for the opening 12 provided in the plate. Suitably secured to the cap 11 is a conical shell 13, which projects above the cap and extends downwardly into the sump 6 to a point closely adjacent its bottom. Detachably mounted upon the upper end of the shell 13 is a

sleeve 14, the upper end of which is closed by a flanged cap 15, provided with a depending shank 16, on which spaced baffles 17 are provided, the baffles conforming in size and shape to the restricted bore 18 of the sleeve 14, and having series of annularly spaced openings 19, through which the soap is forced by compressed air, resulting in aerating and sudsing the liquid. A discharge nozzle 20 communicating with the upper end of the sleeve 14 above the baffles 17, delivers the suds to the palm of the operator's hand cupped below the nozzle.

For detachably clamping the sudser 7 upon the plate 9 and holding the sleeve 14 and cap 15 in assembled position on the shell 13, a bracket 21 is employed, consisting of a strap 22 provided with a notched or bifurcated end 23 adapted to straddle the shell and engage the top of the cap 11. The opposite end of the strap terminates in a depending foot 24 engaging the top of the plate 9, while a screw 25 serves to securely bind the strap against the cap 11. Secured upon the strap 22, by means of a screw 26, is a vertical arm 27 terminating in a finger 28 engaging the top of the flanged cap 15 to securely clamp the same upon the sleeve 14, and, in turn, hold the sleeve on the top of the shell 13. Obviously, upon removal of the screw 25, the entire bracket 21 may be detached, which not only facilitates removal of the sudser 7, but also allows the sleeve 14 and the cap 15 to be detached for the purpose of cleaning.

For the purpose of supplying compressed air to the sudser 7, a comparatively small electric motor M is mounted on the plate 9, and has secured thereto a casing 30, which houses an air compressor of any conventional type.

As best shown in Figure 2, air is supplied to the interior of the shell 13 by a tube 31 passing through the cap 11 and the shell 13, the lower end of the tube being closed and terminating at a point closely adjacent the bottom of the shell 13. Radial openings 32 formed in the lower end of the tube serve to admit compressed air to the interior of the shell 13, while a plate 33 secured to the bottom of the tube and having its peripheral edge slightly spaced from the side of the shell, serves to restrict the end of the shell, and at the same time allow liquid to enter the shell to a level corresponding to that in the reservoir. A flexible tube 34 connects the upper end of the tube 13 with the compressor casing 30, and can be quickly detached from either for removal of the sudser 7.

Secured upon the plate 9 is an electrical switch controlling the motor circuit, as diagrammatically indicated in Figure 1, and while not essential to the operation of the present invention, for the purpose of appearance and cleanliness, a hood 35 is seated upon the upper edge of the reservoir 1 to house the mechanism mounted on the plate. The hood 35 is secured upon the reservoir by means of a screw 36 fastened through the top of the hood and threaded into the plate 9, while the discharge nozzle 20 of the dispenser extends through an opening formed in the bottom of a boss 37 extending laterally from the side of the hood 35.

While the switch illustrated for controlling the motor circuit is of the depressible type, having the plunger extending through an opening in the side wall of the hood 35, for hand manipulation, it is also contemplated that a foot-operated switch may be employed, if desired, to permit free use of both the operator's hands.

In operation, to dispense suds, the operator merely actuates the switch 7 to close the motor circuit and operate the compressor 30, which forces air through the tube 31 into the shell 13 adjacent its bottom and below the level of liquid contained in the reservoir and shell. The plate 33, which serves to restrict the lower end of the conical shell forms sufficient obstruction to prevent air from being expelled from the bottom of the shell to pass upwardly through the liquid contained in the reservoir surrounding the shell. Consequently, all air delivered to the shell travels upwardly, and being broken up as it passes through the restricted openings 32 in the end of the tube 31, the liquid confined within the shell 13 becomes aerated, and slightly fluffed or sudsed on the surface of the liquid within the shell. The heavy suds thus formed are then picked up by the compressed air and forced through the restricted openings 19 in the baffles 17, which has a further tendency to break up the soap particles and eventually deliver the same through the discharge nozzle 20 in a highly fluffed or sudsed condition to the operator's palm held below the boss 37.

Due to the restricted capacity of the sump 6 into which the shell 13 extends, it will be readily seen that the apparatus will function to remove practically all of the contents from the reservoir before filling is required, and due to the fact that the compressed air acts upon a restricted quantity of liquid at all times, the sudsing action remains substantially uniform regardless of the amount of liquid contained within the reservoir. Were the reservoir a closed receptacle, depending upon pressure being created above the contents of the liquid contained therein, naturally, the operation of the machine would vary in relation to change in the level of the liquid, and as the liquid is lowered, a considerable length of time would be required to develop sufficient pressure to force the same through the sudser and dispenser.

Thus it will be seen that in operation, the compressed air created by the compressor rapidly aerates and converts the liquid soap confined within the conical shell into suds, which are further broken up and fluffed as the suds are forced through the restricted passages in the baffles 17.

From the foregoing explanation considered in connection with the accompanying drawing, it will be seen that an exceptionally simple, inexpensive, and efficient liquid soap dispenser has been provided, which is sanitary, attractive in appearance, and requires no effort or operation on the part of the operator, other than closing the motor circuit switch, which, as stated, may be actuated either by the hand or foot.

It will also be seen that the device may be readily disassembled for cleaning or repair, and due to the fact that withdrawal of practically the entire soap contents of the reservoir is possible, frequent filling is eliminated.

I claim:

1. A power-actuated sudser and dispenser for liquid soap comprising, a reservoir, a sudsing and dispensing mechanism extending into said reservoir and comprising, a cap detachably mounted on the reservoir, a conical shell extending through said cap and terminating at its enlarged lower end closely adjacent the bottom of said reservoir, the lower end of said shell having restricted communication with said reservoir, a detachable sleeve mounted on the upper end of said reser-

voir, a plug detachably secured in the upper end of said sleeve and having a depending shank provided with spaced baffles for converting a liquid soap into suds, a tube extending through said cap and into said shell, said tube terminating adjacent the bottom of said shell and being provided with a restricted outlet at its lower end, and an electric motor-driven compressor for supplying air to said tube for forcing soap upwardly through said shell and baffles to convert the liquid into suds and dispense the same.

2. A power-actuated sudser and dispenser for liquid soap comprising, a reservoir open at its upper end and provided at its lower end with a depending skirt to space the bottom from a support a sufficient distance to accommodate the sump formed in the bottom, a plate supported upon the top of said reservoir to admit atmospheric pressure to the reservoir and provided with an opening, a sudsing and dispensing mechanism mounted upon said plate and comprising, a cap forming a closure for said opening in said plate, a conical shell extending through said cap and having its enlarged end positioned in said sump and terminating closely adjacent its bottom, the enlarged end of said shell having restricted communication with said sump, a sleeve detachably mounted upon the upper end of said shell, a plug closing the upper end of said sleeve and provided with a depending shank, spaced baffles provided on said shank and having series of openings, a tube passing through said cap and into said shell, said tube terminating adjacent the bottom of said shell and having restricted openings in its lower end, a motor-driven compressor mounted upon said plate for supplying air to said tube, a detachable bracket for clamping said cap upon said plate and holding said sleeve and plug in assembled position upon said shell, a discharge nozzle for said shell, and a hood mounted upon the upper end of said reservoir for housing said sudsing and dispensing mechanism and said motor-driven compressor, said hood being provided with an opening alined with said nozzle through which suds are dispensed.

JOHN FREDERICK PALMER.