April 15, 1941. M. J. PETERS 2,238,449

SOAP LATHER DISPENSER

Filed Dec. 12, 1938

Fig. 1.

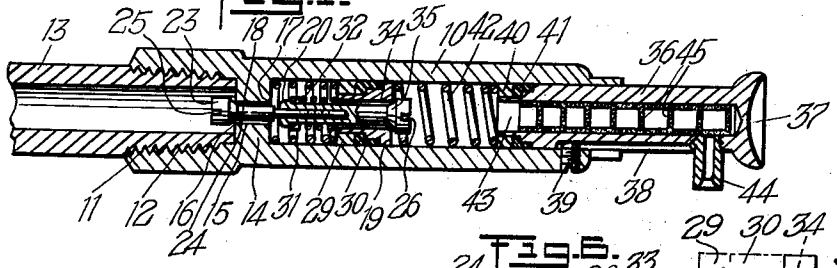


Fig. 6.

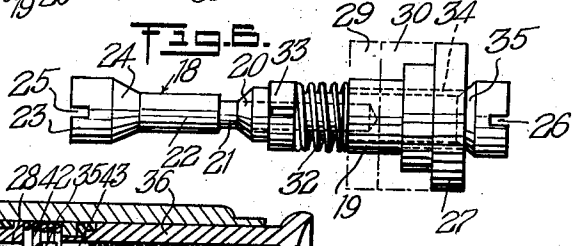


Fig. 2.

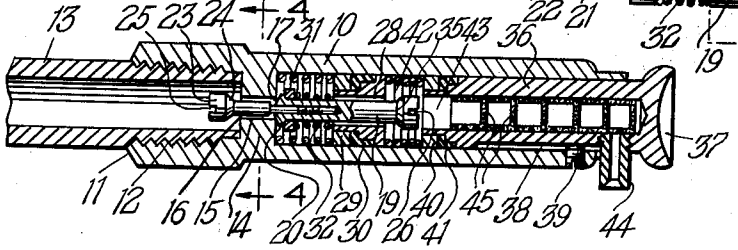


Fig. 3.

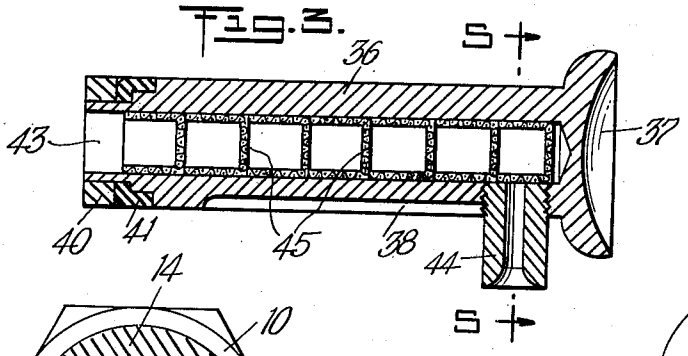


Fig. 4.

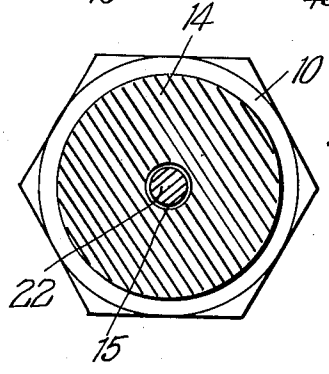
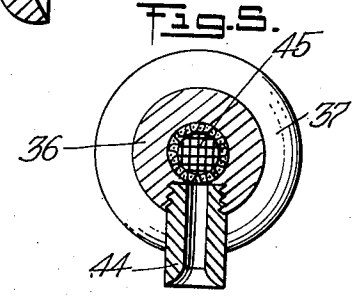


Fig. 5.



INVENTOR.
Martin J. Peters
BY
George Schlatt
ATTORNEY.

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SOAP LATHER DISPENSER

Martin J. Peters, New York, N. Y., assignor to Moore Brothers Company, New York, N. Y., a corporation of New York

Application December 12, 1938, Serial No. 245,181

3 Claims. (Cl. 299—83)

This invention relates to improvements in valves, and more particularly to soap lather dispensers. This invention is particularly directed as an improvement upon Patent No. 1,726,402 dated August 27, 1929.

Objects

Among the principal objects which the present invention has in view are: to provide an improved device for discharging soap in lather condition; to provide a device with chambers in which liquid soap is converted into a soap lather and be discharged therefrom; to utilize a means for converting liquid soap into a soap lather; to confine the parts within the usual external dimensions of present day soap dispensers of this type; to provide a device having minimum parts and which may easily be disassembled for replacing worn parts; to secure simplicity of construction and operation; and to obtain other advantages and results as may be brought out in the following description.

Drawing

Figure 1 is a central longitudinal sectional view of the improved valve and showing the parts thereof in normal relationship;

Figure 2 is a view similar to Figure 1 and showing the valve in operable position for discharging the soap lather;

Figure 3 is an enlarged sectional view of the plunger and discharge end of the valve;

Figure 4 is an enlarged transverse sectional view shown as taken on line 4—4 of Figure 2;

Figure 5 is an enlarged transverse sectional view shown as taken on line 5—5 of Figure 3; and

Figure 6 is an enlarged elevation of the two parts comprising the control assemblage.

Description

In the specific embodiment of the invention illustrated in said drawing, the reference numeral 10 indicates the valve or soap lather dispenser as comprising a cylindrical or tubular member preferably of metal, having openings at each end. One of these ends, herein designated for convenience as the supply end, as 11, is internally threaded at 12 for effecting a connection of the tubular member with a source of supply pipe 13 which leads to a reservoir (not shown) containing liquid soap. The member 10, adjacent the threaded supply end, is provided with a transverse partition 14 having a central passage 15 extending therethrough longitudinally of the member. The partition, adjacent said passage, provides a valve seat 16 at one end of the passage and a similar seat 17 at the opposite end of said passage.

Axially coincident with said member 10 and said central passage 15 of partition 14 is a reciprocable male valve assembly 18 preferably also cylindrical and composed of a plurality of parts for convenience of manufacture and assembly. Said valve assembly is shown as comprising an elongated cylindrical body portion 19 with a valve head 20 thereon at the far side of partition 14 from the supply end of the member adapted to engage and close against valve seat 17. A central threaded bore 21 through this valve head well into the body portion 19 receives a stem 22 which projects through the passage 15 toward the supply end. Said stem is equipped with a head 23 within said supply end of the member 10, said head having a tapered valve-seat-engaging portion 24 adapted to engage valve seat 16 of the partition, and said head also having a diametric slot 25 across its extremity toward the supply for enabling a screw driver to be used for assembly of the stem in the body portion. The opposite end of the body portion has a similar diametric slot 26 for the same purpose. The distance between the seating portions of valve heads 20 and 23 is greater than the thickness of partition 14 thereby enabling the valve assembly 18 to have a limited range of longitudinal movement and alternately close the passage 15 at opposite ends thereof.

Within the cylindrical member 10, forward of said partition 14, is a piston 27 snugly fitting the preferably cylindrical bore of said member. This piston may conveniently comprise a stepped body portion 28 providing a reduced neck on which is screwed a nut 29 for clamping a cupped fibre or other piston ring 30 thereon for effecting the said snug fit with the cylindrical bore of member 10. Within said bore is a spring 31 bearing at one end against the nut 29, and bearing at its other end against partition 14 thereby exerting pressure to slide the piston away from the partition. Within this spring 31 is a smaller spring 32 encircling the valve assembly body portion and bearing at one end against said piston and at its other end against a split collar 33 on said body portion next valve head 20 which retains said split collar from displacement longitudinally.

Piston 27 has a central passage 34 longitudinally through the same of a size sufficient to permit valve head 20 to be pressed therethrough

when assembling the device. Said passage **34** is accordingly of greater diameter than the body portion **19** of the valve assembly **18**, thereby permitting liquid soap to pass through. However, the forward end of said body portion **19** provides a flaring valve surface **35** opposite said passage and adapted to engage the end of the piston around the passage as a seat whereby flow is prevented when the piston moves forward to effect such engagement.

Forwardly of the piston is a plunger **36**, the rear portion of which fits and slides within the cylindrical bore of member **10** and the forward end of which protrudes therefrom and has its extremity shaped as a finger-piece **37** for manual depression in use. Said plunger has a keyway **38** longitudinally disposed at one side thereof for engagement by a radially disposed screw **39** in the member **10** both for preventing rotation of said plunger and for limiting outward displacement thereof. The inner end of said plunger is reduced in diameter and threaded to receive a nut **40** thereon and by which a sealing ring **41** of fibre or other material is secured on the plunger for maintaining a slidable seal between the plunger and bore of the member **10**. A spring **42** is situated within the said bore, bearing at its ends against the nut **40** on the plunger and against the piston respectively. This spring when expanded with the plunger at its outermost position exerts considerably less pressure on the piston, than the opposed spring **31**, and thus, the piston is normally situated in its forward position as shown in Figure 1 when the plunger is forward. However, when the plunger is depressed, outer spring **42** first compresses and eventually exceeds the resistive force of inner spring **31** and obtains an inward sliding of the piston as a result.

Plunger **36** has a central bore or chamber **43** from its rear end to adjacent its forward end, and next said forward end is a discharge nozzle **44** communicating with the said chamber. Said nozzle may conveniently comprise a short length of tubing threaded into a bottom opening through the wall of the plunger and depending therefrom.

As an important feature of the present invention, means are provided for so agitating the liquid soap as to cause the soap to discharge from the nozzle as a lather. For this purpose I have shown a plurality of thimble-like strainers **45** situated in sequence within the said chamber **43** from substantially the inner end thereof to the said nozzle. The liquid soap in passing through the plunger has to pass consecutively through these thimble-like strainers and becomes churned more and more as it approaches the outlet nozzle. By placing these strainers within the plunger, the longitudinal and diametrical, dimensions of the device are not increased substantially over the usual dimensions of soap dispensers of this general ejectment type. It is likewise practical to replace the strainers as may become necessary in use.

In operation, liquid soap is supplied by gravity or otherwise continuously by supply pipe **13**. After the device is once used, liquid soap will be within the bore of member **10** and within chamber **43**. The parts are at rest in the positions shown in Fig. 1 with inner valve head **23** closed against its seat **16** by virtue of spring **31**, and valve head **35** closed against the seat on the piston by virtue of the piston being slit to its forward position. Now as plunger **36** is depressed, small spring **32** still retains this last mentioned valve head **35** closed even as forward spring **42** effects an inward sliding of the piston until the intermediate valve head **20** engages its seat **17**. Further depression of the plunger as shown in Fig. 2 then pumps the soap from between piston **27** and partition **14** to pass through passage **34** thereof into the area occupied by forward spring **42** and into chamber **43**, and thence to discharge as a lather from nozzle **44** by virtue of interposed strainers **45**. During this interval both springs **31** and **32** are acting in opposition to further sliding of the piston, so the piston hesitates during a further considerable depression of the plunger. When the plunger is at about the inner end of its stroke, outer spring **42** becomes so tightly compressed the piston moves further and then outer valve **35** is unseated with respect to the piston.

Upon release from manual depression, plunger **36** returns to its outermost or normal position of Fig. 1, and in so doing permits piston **27** to again move forward and suck in a new supply of soap behind the piston from the supply pipe during the interval that outer valve **35** is closed under influence of small spring **32** and intermediate valve **20** opens and before inner valve **23** closes. It is to be particularly noted that on the depression stroke of the plunger, the approach of the plunger toward the piston functions first, and ejects soap from the nozzle, the piston remaining still. Thereafter the outer spring compresses enough to obtain an initial sliding of the piston without opening the valve **35** thereof until intermediate valve **20** is closed and the plunger depressed much further. On the return stroke of the plunger, the valve assembly remains still until the piston moves out to engage outer valve **35** closing the passage through the piston but with sufficient interval to permit soap to be sucked through the piston before such closing. The inward shift of the piston with respect to the valve assembly takes place at the innermost end of the plunger stroke and during a very small proportion of the plunger stroke and preferably during a period less than a tenth of the plunger stroke. The piston, however, is given its initial inward movement when the plunger is perhaps about half way of its stroke but carries the valve assembly inward with it until intermediate valve **20** is closed, at which position the piston hesitates (both outer valve **35** and intermediate valve being closed during the hesitation) until outer spring **42** is so tightly compressed the final movement of the piston is effected which results in the shifting of the piston with respect to valve assembly **18**. Then and then only is outer valve **35** opened. On the return stroke, however, the piston tends to lag and the outer valve has a longer open period than on the forward stroke of the plunger.

I claim:

1. A device for dispensing quantities of liquid soap, comprising a soap-receiving member having its interior separated by a movable piston, a valve in said piston for effecting a controlled passage of soap from one side of the piston to the other, a plunger positioned in one end of said member, springs on opposite sides of said piston, one of said springs also engaging said plunger and a third spring of less resistance than one of said other springs encircling the valve opposed to the spring engaging the plunger during part of the movement of the piston, said third spring tending to close the valve with respect to the piston, and all said springs being related for enabling varying pressures to be applied to the

piston and successively move the piston with the valve closed and move the piston with the valve open.

2. A device for dispensing quantities of liquid soap, comprising a soap-receiving member having its interior separated by a movable piston, a valve in said piston for effecting a controlled passage of soap from one side of the piston to the other, a plunger having a chamber positioned in one end of said member, springs on opposite sides of said piston, one of said springs also engaging said plunger and a third spring of less resistance than one of said springs encircling the valve opposed to the spring engaging the plunger during part of the movement to the piston, a split collar on said valve, said third spring tending to close the valve with respect to the piston and engaging the split collar to retain the same against displacement, and all said springs being related for enabling varying pressures to be applied to the piston and successively move the piston with the valve closed and move the piston with the valve open.

3. A device for dispensing quantities of liquid soap, comprising a soap-receiving member having its interior separated by a movable piston, a valve in said piston for effecting a controlled passage of soap from one side of the piston to the other, a plunger having a chamber positioned in one end of said member, springs on opposite sides of said piston, one of said springs also engaging said plunger and a third spring of less resistance than one of said springs encircling the valve opposed to the spring engaging the plunger during part of the movement to the piston, a split collar on said valve, said third spring tending to close the valve with respect to the piston and engaging the split collar to retain the same against displacement, and all said springs being related for enabling varying pressures to be applied to the piston and successively move the piston with the valve closed and move the piston with the valve open, and said chamber in said plunger having a plurality of strainers for agitating the soap into a lather prior to discharge therefrom when the said valve is in closed position.

MARTIN J. PETERS.