

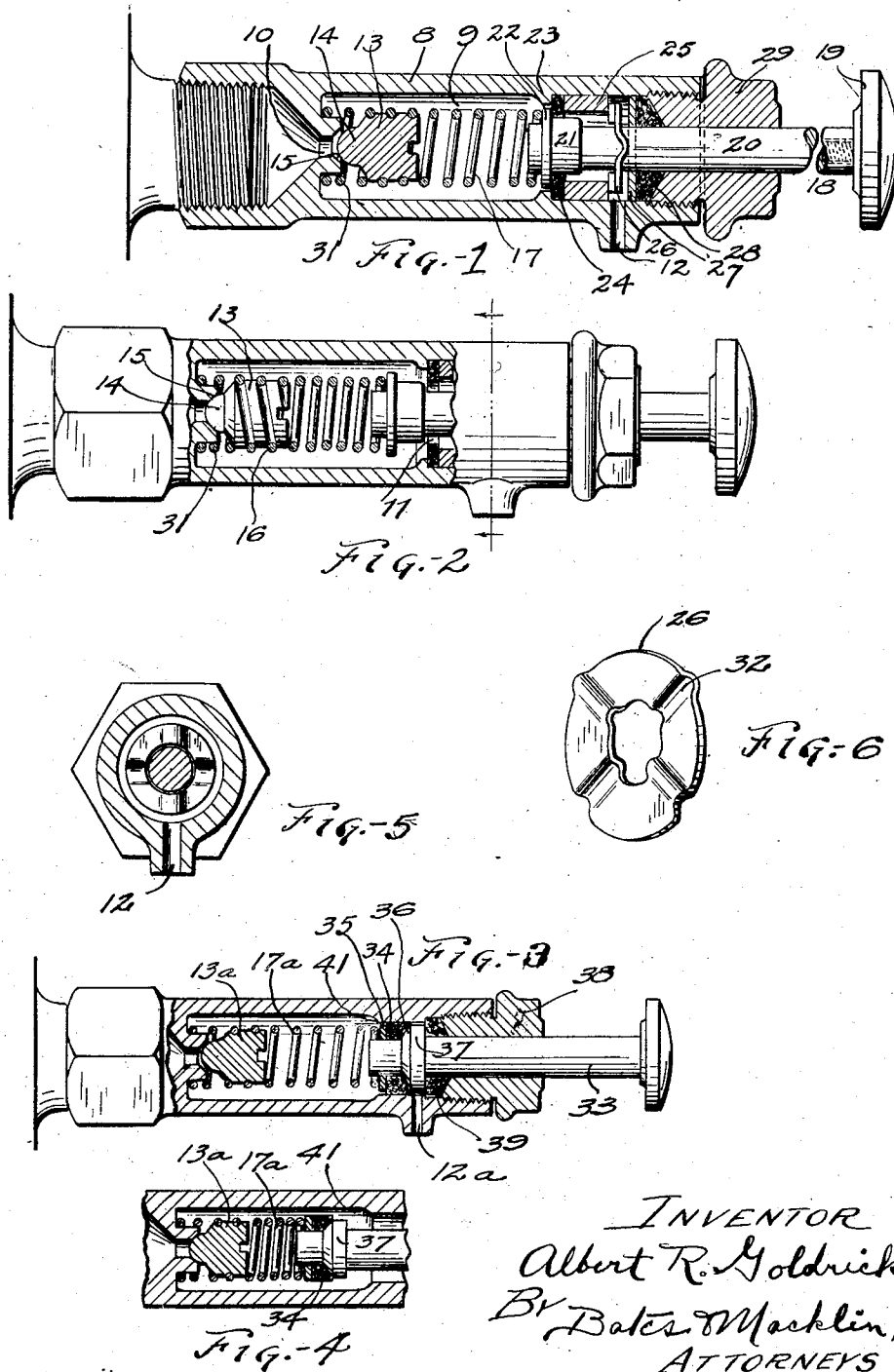
April 12, 1927.

1,624,231

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LIQUID SOAP DISPENSER

Filed March 2, 1921



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Patented Apr. 12, 1927.

1,624,231

# UNITED STATES PATENT OFFICE.

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## LIQUID-SOAP DISPENSER.

Application filed March 2, 1921. Serial No. 449,066.

This invention is directed to improvements in an apparatus for the dispensing of a saponaceous liquid and is more particularly concerned with the provision of a novel means for dispensing liquid soap in predetermined quantities.

Considerable difficulty has been experienced, heretofore, with liquid soap installations, in that leaks usually develop at the dispensing points due to the fact that it is customary to have the source of supply remote from the place of dispensing, thus necessitating the maintenance of considerable pressure in the communicating pipe lines and valves, to insure a steady flow of the liquid. The general object of this invention, therefore, is to provide a dispenser which may normally maintain an efficient seal against considerable pressure and prevent the leaking of the saponified liquid. Other objects include a novel arrangement of the movable parts of the dispensing device wherein minimum wear and incidentally great durability may be obtained without increasing the cost incident to the manufacture of the device.

A further object is to provide an efficient dispenser having a minimum number of interior parts arranged in such a manner that the body of the device may present smooth and symmetrical surfaces in which there are no crevices nor recesses in which soap can accumulate. Still another object is to provide a dispensing device wherein the mechanism will operate to shut off communication between the supply lines and the dispensing outlet during the discharging period.

Other objects will become apparent from the following description of the accompanying drawings which illustrate a preferred embodiment of my device, the essential characteristics being summarized in the claims.

In Fig. 1, I have shown an enlarged cross sectional view of my device with the movable parts in normal position while Fig. 2 is a similar view illustrating the movable parts in dispensing position. In Fig. 3, I have shown a modified form of my device, while Fig. 4 illustrates the movable parts of this modified device in dispensing position. Figs. 5 and 6 are illustrations of detail parts of the device which will be hereinafter referred to.

The modern sanitary method of dispensing soap in hotels, on trains and steamships,

etc., is to provide a system in which there is a remote reservoir or tank adapted to contain an adequate supply of saponified liquid, with pipe lines leading therefrom and communicating with the dispensing points which are usually positioned near the water valves of the wash basins in the lavatories. A variety of devices have been constructed for the purpose of dispensing the soap in lavatories, which, while being efficient and practical during the early use thereof, subsequently develop leaks due to wear and abuse, consequently permitting a constant leakage of the soap from the reservoir.

In my device, therefore, I have arranged the parts in such a manner that the movable members are of simple shape and of such material that continuous use will not cause any comparative wear which will affect the leak proof qualities of the device. To carry out this purpose, I have provided a valve having a discharge chamber 9 with a restricted inlet opening 10 and an outlet 11, both of which are arranged to be alternately closed and opened.

It is quite essential that the inlet opening 10 be sealed before communication is established between the discharge chamber 9 and the dispensing outlet 12 and I have found that a very efficient and satisfactory means of closing this opening may comprise a cylindrical metallic member 13, having a semi-spherical surface 14 adapted to be seated upon the coniform surface 15 of the opening 10. It is quite important, however, that this member should be positioned within the discharge chamber without necessitating the addition of movable parts for the operation thereof and I have found that a very satisfactory arrangement is to provide a spiral groove 16 corresponding in pitch to the normal pitch of the spring coils in the flexible member 17. I am thus enabled to suspend the member 13 within the flexible member 17 by adjusting the member 13 with an appropriate tool until it is properly positioned within the spring 16.

This flexible member may also serve to maintain the valve stem 18 in a normally closed position as shown in Fig. 1, which is comprised substantially of a push button 19, a stem portion 20 and an enlarged valve portion 21 terminating in a flange 22 upon which the spring member is adapted to bear.

The outer end of the valve body 8 may be provided with a smooth bore terminating at a shoulder 23 upon which a suitable packing ring 24 may be compressively positioned by a cylindrical spacing member 25. This cylindrical member may be maintained in position by a specially formed washer 26 and a disk member 27 upon which the valve stem packing ring 28 may be adapted to be seated. All of these members may be held in compressive relation by a suitable packing nut 29 adjustably secured to the valve body in which the valve stem slides. The purpose of the general arrangement of these internal parts is as follows.

By having the packing ring 24 in intimate contact with the shoulder 23 it is possible to adjust both the packing ring and the valve stem packing ring 28 by tightening the packing nut 29 and as the valve portion 21 of the valve stem 18 wears the packing 23, the valve stem will also wear the packing ring 28 a proportionate amount, incidentally when one ring is tightened, the other is likewise tightened, and no difficulties arise through having the packing fit too tightly upon it to permit the spring member 17 to normally maintain it in a normally closed position. Furthermore the manufacture of the valve is greatly simplified in that these internal parts are all of simple design, the member 25 for instance, being a portion of a tube while members 26 and 28 are of such shape as to be formed from ordinary washers.

It is absolutely essential that the inlet 10 be closed by the member 13 before the valve stem 18 has traveled a distance equal to the length of the enlarged valve portion 21 as one of the chief purposes of the valve is to shut off the source of supply and entrap a portion thereof within the chamber 9, from which it may be dispensed. I prefer, therefore, to have the member 13 positioned within the inside of the spring member a sufficient distance away from the opening 10 to permit the ready flow of the saponified liquid into the chamber when the valve stem is normally closed, but of such distance that the free coils 31 lying between the end of the valve chamber and the closing member 13 shall be compressed sufficiently to permit the proper seating of member 13 upon the tapered perimeter 15 of the inlet 10 during the first part of the travel of the valve stem while the packing ring 24 is still in intimate contact with the valve portion 25 thereof. Likewise, it is important that the position of the member 13 with relation to the end of the spring be predetermined when the spring coils are in a non-compressive relation before the spring member is assembled in the valve. Hence, even when the spring member is partially compressed in its assembled position within the

valve chamber, the distance between the closing member 13 and the seat therefore will always be less than the amount of movement the member will have when the spring is further compressed by the valve stem when in use. Hence when the valve stem compresses the spring member, the closing member 13 incidentally seats upon the coniform surface of the inlet and a portion of the liquid trapped within the discharge chamber 9 may then flow through the packing ring 24 into the cylindrical spacing member 25 and along the radial corrugations 32 of the member 26. This member may be of a smaller diameter than the cylindrical spacing member 25 so that the soap may travel about the perimeter thereof and through the dispensing outlet 12.

In the modified form of my device which I have shown in Fig. 3, the spring member 17<sup>a</sup> and closing member 13<sup>a</sup> are adapted to cooperate in the manner heretofore set forth in the description of the valve as shown in Fig. 1. The valve stem 33, however, may be arranged to carry a packing ring member 34 positioned on its inner end and a disk member 35 may bear thereon and take the thrust of the spring member 17<sup>a</sup>, the tapered portion 36 of the flange 37 integral with the valve stem 33, serving as a deflecting means whereby the packing ring 34 may be expanded in an outward direction and incidentally compensate the wear consequent to the repeated movement of the packing member along the bore of the valve. The packing nut 38 may be of a shape similar to the packing nut 29, while the packing ring 39 may rest on a small shoulder 40 formed interiorly of the valve body. In this arrangement the liquid is retained within the discharge chamber in a manner similar to the operation of the valve shown in Fig. 1, the packing ring 36 remaining in contact with the piston bore of the valve until the closing member 13<sup>a</sup> is properly seated and upon a further movement of the valve stem thereafter, the soap may escape through the bore as the packing ring passes the edge 41 from which it may then flow along the valve stem and through the dispensing outlet 12<sup>a</sup> as shown in Fig. 4.

From the foregoing description of my invention it is obvious that I have provided a dispensing device in which the movable members are arranged in such a manner that they may be properly sealed to prevent leaks along their surfaces and also that the members which are subjected to wear may be readily adjusted to take up the wear. Furthermore, a valve of this construction may be disassembled by the removal of a single member which will permit the removal of all of the interior members; this arrangement being very advantageous when replacing packing rings. Furthermore the parts

are so simple in character that upon reassembling the device, it would be impossible to arrange them in any but the proper manner. Furthermore it is to be understood that this dispensing device is arranged so  
 5 that it may be manufactured at a very economic cost without in any way sacrificing the efficient operation of the mechanism. Likewise the parts serve to oppose the pressure of the supply line irrespective of the  
 10 amount of such pressure, for upon an increase of this pressure the packing members are acted upon by the other members and have a proportionately greater sealing effect.

Having thus described my invention, I claim:

1. In a liquid dispenser, the combination of a valve body provided with a displacement chamber having an inlet and an outlet, a valve seat surrounding said inlet, a valve member disposed within the displacement chamber and adapted to rest on said seat and close said inlet, a spring member  
 20 acting on the valve member to maintain it unseated and a plunger acting on the spring to indirectly move the valve member, whereby said valve member may be caused to rest on said seat and close the inlet at a predetermined movement of the plunger and  
 30 spring.

2. A liquid dispenser having in combination a cylinder provided with an inlet valve seat formed interiorly thereof and a discharge outlet, a resilient member disposed within the cylinder, valve closing means carried and supported solely by the resilient member and arranged to contact with the inlet valve seat and a valve stem controlling  
 35 the outlet and maintained in a normal outlet closing position by said resilient member.

3. A dispenser valve body provided with a displacement chamber having an inlet and an outlet valve seat formed therein, a resilient member disposed within the displacement chamber, a valve stem having a valve head and means carried solely by the resilient member for contacting with the inlet valve seat consequent to a predetermined inward movement of the valve stem, said resilient member normally maintaining the valve head in contact with the outlet valve seat.

4. A dispenser valve comprising a valve  
 55 body having a displacement chamber, an inlet and an outlet communicating with said chamber and positioned at opposite ends of the chamber, a valve stem having a valve head adapted to normally seal said outlet,  
 60 a resilient member positioned within the

chamber adapted to maintain the stem with the valve head in a normally sealed position relative to the outlet and means carried solely by the resilient member for sealing the inlet when the resilient member is compressed by an inward movement of the valve stem.

5. A liquid dispenser having in combination a valve body provided with a displacement chamber having an inlet and an outlet and a valve seat surrounding said inlet and outlet, a valve stem having a valve head projecting into the chamber and means positioned within the chamber comprising a spring and a valve closing member adapted to close the inlet, said valve closing member being carried solely by the spring whereby the inlet becomes closed consequent to a compression of the spring.

6. A liquid dispenser comprising a valve body having a displacement chamber provided with an inlet and an outlet port, a valve stem having a valve head, a spring positioned within the displacement chamber having one end abutting the wall of the displacement chamber and the other end abutting the valve head and an inlet closing member carried by the spring between the valve stem and the inlet whereby an inward movement of the valve stem will compress the spring and thereby cause the inlet closing member to close the inlet.

7. A liquid dispenser having in combination a valve body provided with a displacement chamber, oppositely disposed valve seats formed within the valve chamber, a valve stem having a valve head, a spring abutting the valve head, an inlet closing means carried by the spring for sealing one of said valve seats when an inward movement of the valve stem compresses the spring member, said means being so disposed relative to the stem that the movement thereof is caused as the stem compresses the spring.

8. In a valve of the character described a metallic body member having a displacement chamber provided with inlet and outlet ports surrounded by valve seats, a valve stem having a head adapted to close the outlet port, a metallic valve member disposed within the displacement member, a spring between said valve member and the valve head of the stem, said metallic valve member being carried solely by the spring adapted to close the inlet by metal to metal contact upon a predetermined inward movement of the valve stem.

In testimony whereof, I hereunto affix my signature.

ALBERT R. GOLDRICK.