

C. W. COREY.
LIQUID SERVER.
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1,152,607.

Patented Sept. 7, 1915.

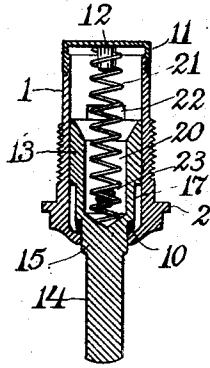


Fig. 2

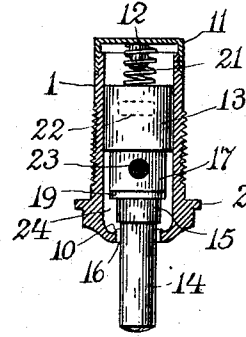


Fig. 3

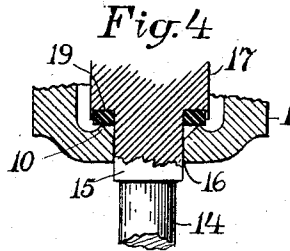


Fig. 4

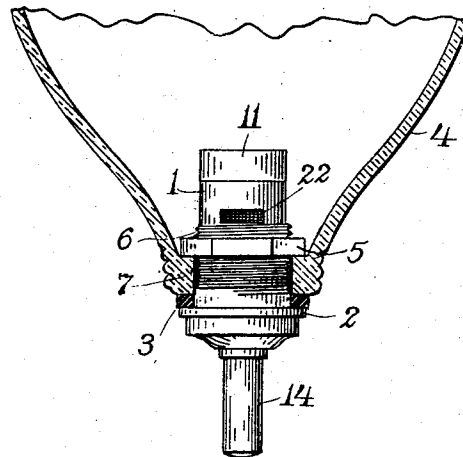


Fig. 1

Witnesses;

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LIQUID-SERVER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES W. COREY, a subject of Great Britain, and a resident of Malden, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Liquid-Servers, of which the following is a full, clear, and exact description.

The object of this invention is the construction of an improved server for liquids, and particularly of liquid soap, wherein an upwardly pressed plunger delivers the liquid into the hand beneath, the especial improvements relating to means for preventing a clogging of the delivery openings by hardened soap, to means enabling the soap to be delivered into the hand upon the upward movement of the delivering means, to means for keeping the delivery device from dripping, to economy of construction, and to other improvements hereinafter set forth.

Referring to the drawings forming part of this specification, Figure 1 is a sectional elevation of the lower part of a liquid soap container, showing in side view a liquid server embodying my improvements. Fig. 2 is a central vertical section of the liquid server. Fig. 3 is a partially sectional view of the same showing the delivery plunger in a partially elevated position. Fig. 4 is a sectional detail view.

The liquid server is substantially a tube 1 having an external shoulder 2 pressed upward against the bottom opening 7 of the liquid receptacle 4 by means of a nut 5 turning on the threaded section 6 of the tubular member 1, a yielding washer 3 being introduced to render the closure liquid-tight. Within the tubular member 1, at its lower end, is a seat 10 preferably formed with an acute edge. The upper end of the tubular member is closed by a screw cap 11 having a central descending lug or pin 12.

Within the tubular member 1, and liquid-tight therein, is a plunger 13 having a stem 14 and two shoulders intermediate of the stem and plunger. The member 1 has a central opening 16 therein, and is provided with a valve seat 10. The lower shoulder 15 fits the opening 16, and is but slightly larger in diameter than said stem, while the upper shoulder 17 is about half way between the diameters of the plunger and the lower shoulder. Said shoulder 17 is sharply undercut, as shown in Fig. 4, and is preferably provided with a washer 19.

As illustrated in Fig. 2, the plunger 13 and upper shoulder 17 are drilled out as much as is consistent with the strength of the parts; and within the hole 20 thus made is located a push spring 21 whose upper end abuts against the under surface of the screw cap 11, and is kept from lateral displacement by means of the projection or pin 12. The upper edge of said hole is beveled in order to increase the amount of soap which will be taken into the interior of the plunger as the latter is elevated. In addition, such bevel removes possible edges or corners upon which the spring 21 might catch. Immediately above the top edge or lip of the plunger 13 when in its lowermost position, is an opening or openings 22 through the wall of the member 1 for the admission of the soap from the receptacle 4.

Near the bottom of the hole 20 is a hole 23 opening radially through the shoulder 17 into the space 24. Through such hole or holes 23 the liquid soap which enters the interior of the member 1 and thence the plunger 13, passes to the chamber 24, but is kept from leakage by means of the washer 19 above referred to. In addition to this washer, which fits within the overhanging edges of the shoulder 17, leakage is prevented by the snug fit of the lower shoulder 15 in the hole 16, but the washer is the main reliance for the purpose.

When the plunger stem is pressed upward by the application of the operator's hand, palm upward, against the end of the same, the lower shoulder 15 does not rise above the seat 10 until just after the lip of the plunger 13 comes above the opening or openings 22. As soon, however, as said shoulder 15 frees the hole through said seat, the liquid soap filling the space surrounding the shoulders 15, 17 should theoretically be free to descend about said stem. As a matter of fact, however, were the plunger to stop at such point, the one illustrated in Fig. 3, there would be no such delivery of the soap but the same would be supported within the delivery device by atmospheric pressure. The operator consequently must push the plunger until it reaches the screw cap 11. During the movement of the plunger's lip between the top of the opening 22 to the said screw cap, since said opening is closed by the plunger, there can be no escape for the soap within the plunger and upper part of the tubular member, except down

through the hole 20 and radially out through the hole or holes 23 into the annular space about the shoulders 15, 17, and thence down about the stem 14. This gives a forced feed of the soap during the upward stroke of the plunger.

As the upward pressure of the hand is removed and the plunger descends, there is a tendency to form a vacuum above it, and the soap remaining about the shoulders 15, 17 is forced up by atmospheric pressure to fill such vacuum. This action continues until the shoulder 15 enters the hole 16, and until the top of the plunger reaches the opening 22. Hence there can be no dripping of the soap from the stem after the plunger begins its descent, but the delivery is positive and clean cut, both in its beginning and its termination. The quantity of soap delivered is therefore that originally surrounding the shoulders 15, 17, and some of that within the plunger. After the plunger has descended to its normal position, the openings 22 are uncovered, the air sucked into the annular chamber 24 rises through the holes 23, 20 and 22 into the receptacle 4, and soap sinks to fill such chamber.

The purpose of the shoulder 15 is twofold: The first is to prevent the escape of soap until after the openings 22 have been closed by the plunger. Otherwise, after the plunger has been raised enough to free the washer 19 from the seal 10 but not enough to close the openings 22, there would be a continuous flow of soap from the receptacle. The second, and even more important purpose of said shoulder is that of dislodging any crust of hardened soap which is liable to accumulate in the opening 16 about the stem 14 and thereby shutting off the flow of the soap. As the plunger descends, after its first elevation following a period of several days of non-use, said shoulder breaks away and carries downward any such accumulation as might form.

It is necessary to have the plunger 13 quite long for two or three reasons: First, it must reach high enough to touch the under edge of the opening 22, and the latter must be quite high in order to be above the threads 6 and nut 5. Second, it must be long enough to keep said opening or openings closed during the upper part of the plunger's movement, and when the latter reaches to the top 11. Such length of the plunger aids, also, in retaining the stem central within the opening 16, but my main reliance in keeping the shoulder 15 from meeting and resting upon the seat 10 is to

chamfer the edge of the latter, as shown in Fig. 4, so that there is no such edge to meet.

What I claim is:

1. A liquid delivery device comprising a tubular member having an opening at its lower end and a seat surrounding the opening, the upper end of the tubular member being air-tight, said member having a lateral opening spaced from said upper end and communicating with the liquid to be delivered, a vertically extended plunger slidable liquid-tight in the tubular member and having a stem somewhat smaller in diameter than, and descending through, the lower opening of the tubular member, the stem having a shoulder larger in diameter than itself but smaller than the plunger for closing the lower opening by coaction with the seat, and yielding means pressing the plunger downward, the plunger having a hole descending from its upper end and communicating through to the space about the shoulder, and the upper end of the plunger being normally at the level of the lower edge of the lateral opening.

2. A liquid delivery device comprising a tubular member having an opening at its lower end and a seat surrounding the opening, the upper end of the tubular member being air-tight, said member having a lateral opening spaced from the upper end and communicating with the liquid to be delivered, a vertically extended plunger slidably liquid-tight in the tubular member and having a stem smaller in diameter than, and descending through, the lower opening of the tubular member, the stem having at its upper portion a shoulder fitting the lower opening, and a second shoulder between the first-named shoulder and the plunger and smaller in diameter than the latter but larger than the first-named shoulder, for closing the lower opening by coaction with the seat, and yielding means pressing the plunger downward, the plunger having a hole descending from its upper end and communicating through to the space about the second-named shoulder, and the upper end of the plunger being normally at the level of the lower edge of the lateral opening.

In testimony that I claim the foregoing invention, I have hereunto set my hand this 11th day of May, 1914.

CHARLES W. COREY.

Witnesses:

A. B. UPHAM.

H. P. UPHAM.