G. A. LOEBEN.

DISPENSER FOR FLUID MATERIAL.

APPLICATION FILED AUG. 6, 1919.

1,403,426.

Patented Jan. 10, 1922.

2 SHEETS—SHEET 1.

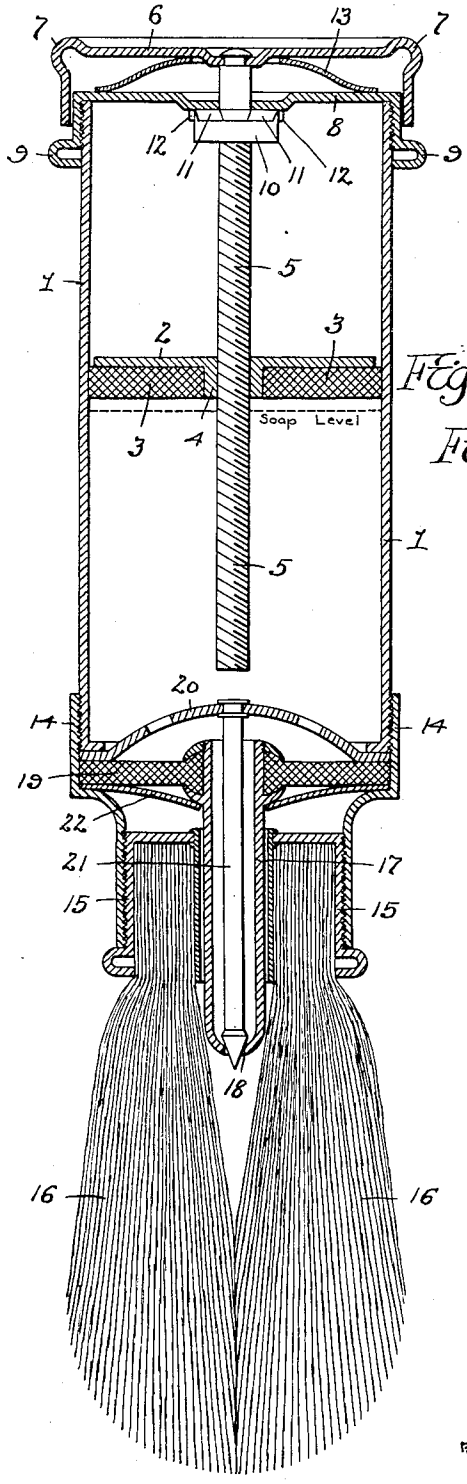


Fig. 1.

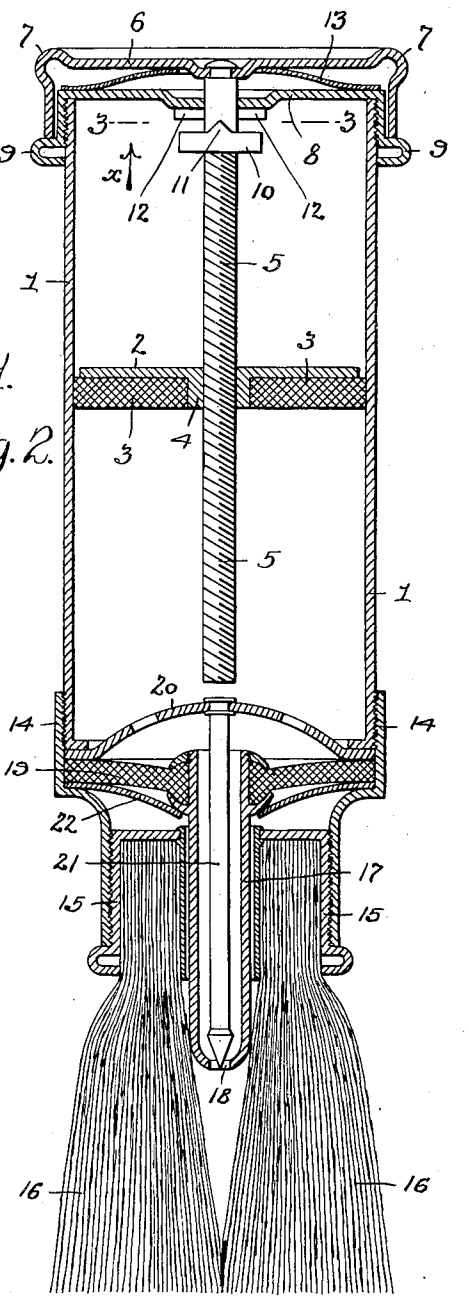


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

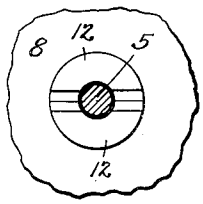


Fig. 4.

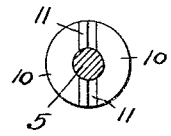


Fig. 5.

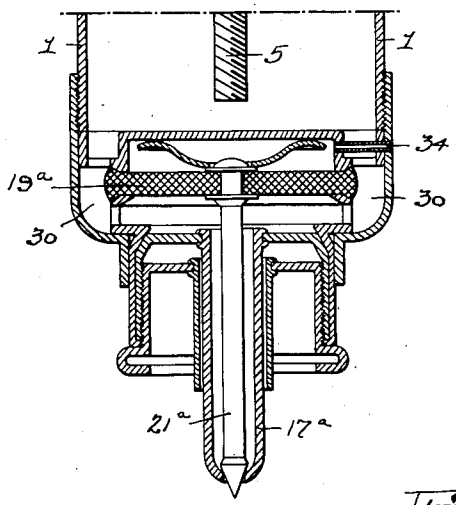


Fig. 6.

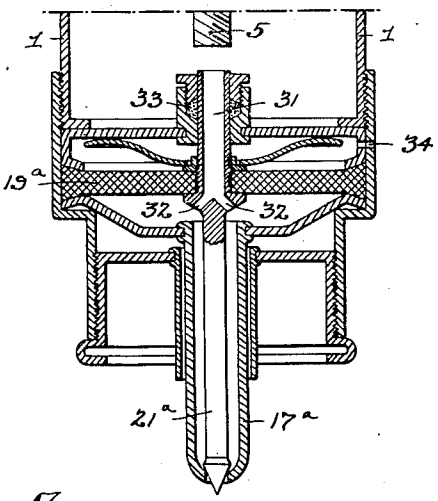
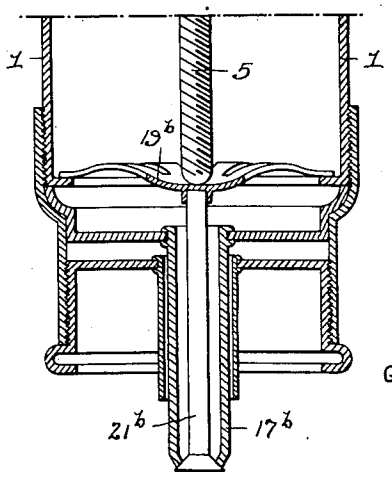


Fig. 7.



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UNITED STATES PATENT OFFICE.

GUSTAVE A. LOEBEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO PREMIER APPLIANCE COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

DISPENSER FOR FLUID MATERIAL.

1,403,426. Specification of Letters Patent. **Patented Jan. 10, 1922.**

Application filed August 6, 1919. Serial No. 315,616.

To all whom it may concern:

Be it known that I, GUSTAVE A. LOEBEN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Dispensers for Fluid Material, of which the following is a specification.

My invention relates to that type of fluid dispensers which are intended for injecting charges of fluid soap, paste, lather or the like (hereinafter for convenience referred to as "soap") into a shaving brush or other receiver and especially to such dispenser in which the fluid soap is forced from a reservoir by means of a plunger acted upon by a rotating feed screw, the object of my invention being to prevent leakage of the soap into the brush or around the plunger during the intervals between the feeding of the successive charges to the brush.

With this object in view my invention comprises first, means for releasing the fluid soap from pressure during such intervals, and second, means for automatically closing during said intervals, the valve which governs the discharge of soap into the brush.

In the accompanying drawings

Fig. 1 is a vertical sectional view on an enlarged scale of a shaving brush having combined therewith a fluid dispensing device constructed in accordance with my invention the parts being shown in the positions assumed by them when the soap is relieved from pressure;

Fig. 2 is a similar view illustrating the parts in the position assumed by them when the soap is being subjected to pressure;

Fig. 3 is an inverted sectional plan view on the line 3—3, Fig. 2, looking in the direction of the arrow x;

Fig. 4 is a similar view on the same line, looking in the reverse direction, and

Figs. 5, 6 and 7 are vertical sectional views of the forward portion of a dispenser illustrating certain modifications of my invention.

Referring to Figs. 1 to 4 of the drawing, 1 represents a tube or reservoir in which is adapted to operate a plunger 2 with flexible packing 3 and central nut 4, the latter engaging the threads of a central screw stem 5 whose rear or upper end is swiveled to the central portion of an operating cap 6, the latter having a beaded edge 7 knurled or otherwise roughened so as to facilitate manipulation of the same.

The rear end of the reservoir 1 is closed by a screw cap 8 having a similarly roughened bead 9 thereon and having therein a central opening through which the rear end of the screw stem 5 projects, as shown.

That portion of the screw stem 5 adjacent to the inner or forward face of the cap 8 has suitably secured to it, so as to rotate therewith, an annular flange 10 and upon the rear face of the latter are radially disposed cams 11 with bevelled faces as shown in Figs. 1, 2 and 4, said cams cooperating with cam faces 12 formed on the inner or forward face of the cap 8 as shown in Fig. 3. A slight forward movement is therefore imparted to the screw stem 5 when the cams engage one another at the beginning of the turning movement of said screw stem, a spring 13 interposed between the cap 6 and cap 8, as shown in Figs. 1 and 2, serving to impart like rearward movement to said screw stem when the cams 11 pass out of engagement with the cams 12.

Normally the cam faces 11 and 12 bear the non-engaging relation to one another shown in Fig. 1, the cap 6 and screw stem 5 being pressed rearwardly by the spring 13 so as to draw the plunger 2 rearwardly and release from pressure the fluid mass of soap which is contained within the reservoir 1 in advance of said plunger, but as soon as the screw stem 5 commences to turn the cams 11 will engage the cams 12 and will force the screw stem 5 forwardly, thus carrying the plunger towards and into contact with said fluid mass, further rotative movement of said screw stem continuing the forward movement of said plunger and thereby forcing the fluid mass forwardly in the reservoir 1.

The forward end of the reservoir 1 is engaged by the internally threaded rear end of a ring 14 whose forward end is contracted in diameter and internally threaded for the reception of an externally threaded ferrule 15 which has confined therein the butt ends of the mass of bristles 16 of which the brush is composed.

Forwardly into the central portion of this mass of bristles projects a tube 17, open at its rear end and having a contracted opening 18 at its forward end, the rear end of the

tube being rigidly and centrally confined to a flexible diaphragm 19 whose peripheral edge is confined between a shoulder of the ring 14 and the peripheral portion of a concavo-convex bridge plate 20 which bears against an internal flange at the forward end of the reservoir 1 and is perforated so as to permit free passage of the fluid soap forwardly through the same. Secured to the central portion of the bridge plate is the rear end of a valve rod 21 whose forward end is pointed and cooperates with the seat formed by the contracted forward end of the tube 17 to constitute valve mechanism whereby the forward flow of soap into the brush is permitted or cut off as required, the valve rod 21 occupying a continuously fixed position but the tube 17 moving forwardly when the central portion of the diaphragm 19 is moved forwardly by the pressure of the soap thereon, said diaphragm 19 being moved rearwardly by means of a spring plate 22 when said pressure is released.

When the tube 17 is moved forwardly its forward end is carried away from the conical end of the valve rod 21 and flow of soap into the interior of the brush is permitted, but as soon as the soap is released from the forward pressure of the plunger 2 the diaphragm 19 is moved rearwardly by the spring plate 22 and the conical end of the valve rod closes the opening in the forward end of the tube 17 so as to effectually cut off any further flow of soap into the brush at that time.

By reason, therefore, of this automatically acting valve construction in connection with the previously described movements of the plunger 2 all leakage of soap into the brush or around the plunger during the intervals between the successive feedings of soap to the brush is effectually prevented.

The time occupied in effecting the engaging and releasing movements of the plunger in respect to that occupied in effecting the feeding movements of said plunger are dependent upon the construction and relation of the cam surfaces 11 and 12. As shown each of these cam surfaces is disposed on opposite sides of the axis of the screw stem 5, so as to equalize the pressure thereon, the cams 11 being in the form of relatively narrow ribs but each of the cam surfaces 12 extending throughout about one-half of a circle, hence, after the first engagement of the cams which causes the plunger to be projected into contact with the mass of soap there will be about one-half turn of the screw stem 5 and a corresponding forward feed of the plunger before the cams are disengaged and the plunger is withdrawn from contact with the soap, and by varying the character and extent of the cam surfaces this time element may be likewise varied as may be desired.

In those embodiments of my invention shown in Figs. 5 and 6 the arrangement of the parts constituting the valve mechanism is reversed as compared with the construction shown in Figs. 1 and 2, the tube 17^a being the fixed member and the valve rod 21^a the movable member. Said valve rod is carried by the diaphragm 19^a, hence the movements of the latter are also the reverse of those of the diaphragm 19, the central portion of the diaphragm 19^a moving backwardly when pressure is imparted to the soap, and forwardly when such pressure is released.

This necessitates pressure of the soap upon the forward instead of upon the rear face of the diaphragm, and consequent free flow of soap from the reservoir to said forward face. In the construction shown in Fig. 5 this flow is permitted by passages 30 in the wall of the diaphragm holder, and in the construction shown in Fig. 6 by passages 31 and 32 formed in the tubular rear end of the valve rod 21^a, which is open at its rear end to the soap in the reservoir, and plays in a stuffing box 33 on the forward head of the tube 1. Free flow of air into or from the chamber between the diaphragm 19^a and the member of the fixed structure towards and from which it moves in action, is permitted by one or more vent openings 34.

In the construction shown in Fig. 7, however, the flexible diaphragm is dispensed with, the rear end of the valve rod 21^b being mounted in the central portion of an elastic spring fingered disk 19^b disposed in the forward end of the reservoir, and acted upon directly by the forward end of the screw stem 5 as the latter is projected by the cam action before the beginning of each feed, the elasticity of the disk also causing it to follow the valve stem in its rearward movement.

In this construction, also, the valve and valve seat are so disposed that the valve opens on the forward movement of the valve rod, and closes on the rearward movement of the same.

The means employed for imparting longitudinal movement to the screw stem may be independent of those for imparting rotating movement thereto but the construction shown is preferred.

I claim:

1. The combination, in a dispenser for fluid material, of a reservoir, means for imparting pressure to the material therein, a flexible diaphragm, means for flexing the same as the pressure is applied and removed, and valve mechanism comprising a valve and valve seat, one of said members being carried by said diaphragm.

2. The combination, in a dispenser for fluid material, of a reservoir, means for imparting pressure to the material therein, a flexible diaphragm, means for flexing the

same as the pressure is applied and removed, and valve mechanism comprising a valve, and valve seat, one of said members being carried by said diaphragm and the other being fixedly mounted.

3. The combination, in a dispenser for fluid material, of a reservoir, means for imparting pressure to the material therein, a flexible diaphragm acted upon by the fluid under pressure, and valve mechanism comprising a valve and valve seat, one of said members being carried by said diaphragm.

4. The combination, in a dispenser for fluid material, of a reservoir, means for imparting pressure to the material therein, a flexible diaphragm acted upon by the fluid under pressure, and valve mechanism comprising a valve and valve seat, one of said members being carried by said diaphragm, and the other being fixedly mounted.

5. The combination, in a dispenser for fluid material, of a reservoir, means for imparting pressure to the material therein, a flexible diaphragm, means for flexing the same as the pressure is applied and removed, and valve mechanism comprising a discharge tube with valve seat therein, and a valve coacting therewith, one of said valve members being carried by said diaphragm.

6. The combination, in a dispenser for fluid material, of a reservoir, means for imparting pressure to the material therein, a flexible diaphragm, means for flexing the same as the pressure is applied and removed, and valve mechanism comprising a discharge tube with valve seat therein, and a valve coacting therewith, one of said valve members being carried by said diaphragm and the other being fixedly mounted.

In testimony whereof, I have signed my name to this specification.

GUSTAVE A. LOEBEN.