Feb. 4, 1936. D. L. SPENDER 2,029,743

LIQUID DISPENSER

Filed March 7, 1935

Fig. 1

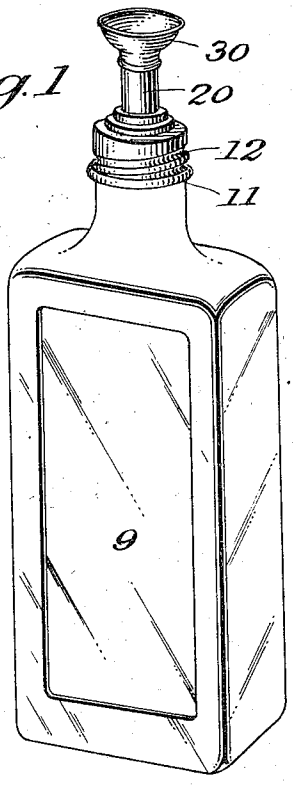


Fig. 3

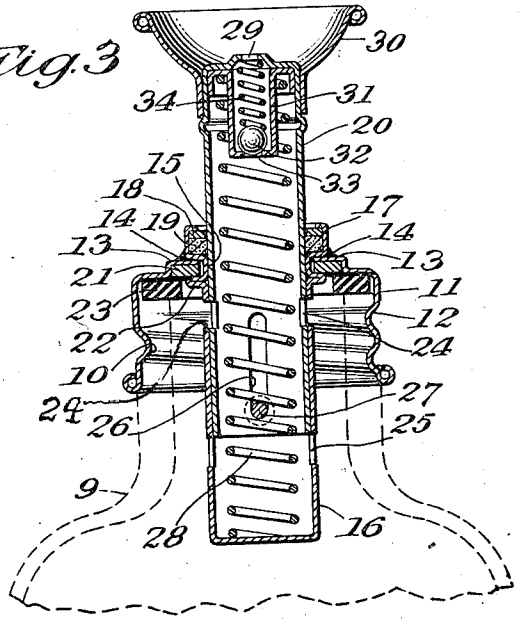


Fig. 2

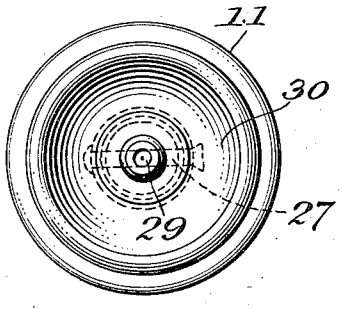
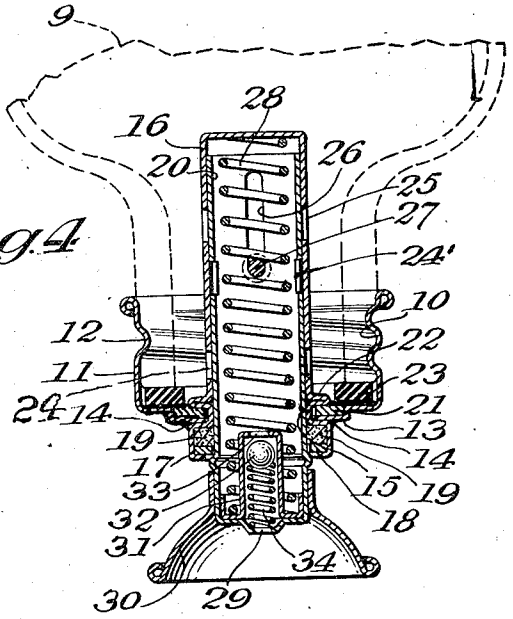


Fig. 4



INVENTOR.
Donald L. Spender
BY E. M. Neumann
ATTORNEYS.

Patented Feb. 4, 1936 2,029,743

UNITED STATES PATENT OFFICE

2,029,743

LIQUID DISPENSER

Donald L. Spender, Waterbury, Conn., assignor to Scovill Manufacturing Co., Waterbury, Conn., a corporation of Connecticut

Application March 7, 1935, Serial No. 9,702

4 Claims. (Cl. 221—98)

This invention relates to new and useful improvements in a combined bottle closure and liquid dispenser, such as is adapted to be used for hand lotions, hair tonics and other cosmetic preparations.

The primary object of the invention is to produce a novel form of liquid dispenser of the foregoing character whereby limited quantities of liquid may be discharged from a container, from time to time, as occasion may require, by inverting the container and pressing the mouth end of the dispenser against the palm of a hand or other object, and further to embody means that will prevent a continuous flow or discharge of the liquid when the apparatus is being operated for the discharge of predetermined quantities of the liquid.

The dispenser is obviously adapted to be used in connection with a container, such for instance as a bottle, and as shown in the drawing is designed to be attached by means of screw threads that serve to engage corresponding threads formed on the mouth of the bottle.

A further feature of the invention is to provide in it a valve which serves to normally close and seal the container to which it is applied, yet is adapted to freely operate to dispense specific quantities of liquid when the container is properly inverted and the dispenser pressed against an object such as the palm of one's hand.

Other objects of the invention will appear from the following description and accompanying drawing and the features of novelty will be pointed out in the claims.

With the above mentioned and other objects in view, the invention consists in the novel construction and combination of parts hereinafter described, illustrated in the accompanying drawing and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

To more fully comprehend the invention, reference is directed to the accompanying drawing, wherein—

Fig. 1 shows a perspective view of a container, in the form of a bottle, to the mouth of which my improved closure and dispenser is shown applied;

Fig. 2 shows a detached top plan view on an enlarged scale of the dispenser as seen from the top of Fig. 1;

Fig. 3 shows a central vertical longitudinal sectional view of the dispenser shown in Fig. 1 though drawn on the same scale as Fig. 2, the parts being in a closed position; and

Fig. 4 shows another central vertical longitudinal section of the dispenser as shown in Fig. 3 though in an inverted and operative position, as in the act of dispensing a small limited quantity of liquid.

Referring in detail to the characters of reference marked upon the drawing, 9 represents a container which may be in the form of a glass bottle of suitable size and proportions and having a reduced threaded neck portion 10 to which the threaded closure cap 11 of the container is applied. The dispenser, as will be seen, is for the most part formed of tubing, certain portions of which are secured together while others are associated in a manner to form an operative structure. In addition to the roll threads 12 of the closure cap, I also provide an inwardly disposed flange 13 that forms an annular top end portion of the cap. The inner edge portion of this flange is secured as by means of solder 14 in an annular groove 15 of a tubular casing 16 that extends well down into the neck of the container. The upper end of this casing is further shaped to form an annular pocket 17 in which is contained a reinforcing washer 18 and a packing ring 19 to insure a tight joint as between the casing 16 and a plunger tube 20 which is mounted for reciprocatory movement therein. A reinforcing washer 21 is also provided between the underside of the flange 14 and an annular flange 22 of the casing. A gasket 23 is also employed between the inside of the cap and the top end of the neck of the container so as to insure tight closure of the container when the cap is screwed down in position. The tubular casing 16 is provided with two upper side openings 24 and two lower side openings 25, the upper ones of which normally register with a similar opening 24' in the plunger tube, thus serving to admit the liquid into the tube from the container when the parts are in their normal position as shown in Fig. 3. The inner or plunger tube 20 is provided in its opposite side with elongated slots 26 through which a pin 27 carried by the outer tube 16 extends, so as to limit the longitudinal movement of the plunger tube with respect to the outer casing 16. A spring 28 is positioned within these tubes, with one end abutting against the inner end of the casing and the other end of which is similarly positioned against the upper end of the plunger tube, the natural effect of which is obviously to retain the

plunger tube in its extended normal position as shown in Fig. 3. This plunger tube is provided with a liquid outlet 29 and a flared annular flange 30, the latter being secured to the tube in any suitable manner, and serves to form a chamber around the opening 29 so that when the dispenser is pressed against a hand for releasing liquid the outlet opening will not be obstructed. An elongated valve chamber 31 is secured to the inner end of the plunger tube in any suitable way and in position to cover the outlet 29, so that any liquid passing from the container must go through the tube and its quantity controlled by the action of the valve contained therein. This valve comprises a ball 32 that is normally seated upon an inlet opening 33 in the lower end of the valve chamber 31 by means of a spring 34, one end of which presses against the ball valve and the other against the upper end of the plunger tube.

From the foregoing it will be seen that the dispenser is operated by first inverting the container in a manner to fill the tubes from the container while the plunger is still in the position shown in Fig. 3; and then to engage the flange 30 of the tube with the palm of a hand or other suitable object in a way to telescopically move the plunger tube longitudinally in the casing 16 in a way to close the side openings 24 and 25. This obviously produces a pressure of the liquid against the valve sufficient to dislodge it from its seat and allow a limited flow of liquid therefrom and be ejected from the outlet opening 29. If a sufficient quantity of liquid is not thus obtained with the one operation the dispenser may be raised from the hand and the pressing operation repeated, whereby an additional deposit is obtained.

Having thus described my invention, what I claim and desire to obtain by Letters Patent is:

1. In a liquid dispenser, supporting means, an elongated tubular casing secured to the supporting means and having a closed inner end and an opening in its side, a relatively long tubular plunger closely fitting and slidably mounted in the casing and having an open inner end, a discharge outlet in its outer end and openings in its sides to register with those of the casing, a pin in the casing and extending through the plunger to limit the movement of the plunger tube within the casing, a spring within the tubes engaged by said pin to normally retain the plunger tube in position to insure the registration of the side openings, the said plunger tube having an extended annular flange on its outer free end portion surrounding the discharge outlet.

2. In a liquid dispenser, a liquid container, a closure cap therefor, and dispensing mechanism carried by the cap and including an elongated tubular casing of uniform diameter extending into the container and having a closed inner end and openings in its side, an elongated tubular plunger slidably mounted in the casing and having an open inner end and an outlet opening in its outer end and having side openings intermediate of its length to register with those of the casing, means to limit the movement of the plunger tube within the casing, a spring within the elongated tube to normally retain the plunger tube in position to insure the registration of the side openings, the said plunger tube having an extended cup formed on its outer free end portion surrounding the outlet opening, and a spring-actuated valve positioned in the cupped end portion of the plunger tube adapted to normally retain the valve in closed position.

3. In a liquid dispenser, a threaded closure cap, a centrally extended tubular casing secured to the cap and having a closed inner end and an opening in its side, a tubular plunger slidably mounted in the casing and having a discharge outlet in its outer end and openings in its sides to register with those of the outer casing, a spring within the casing and plunger positioned within and between the end of the plunger and the casing, a valve chamber within the outer end of the plunger tube and having an inlet opening and covering the discharge outlet, and a spring-actuated valve closing the inlet opening.

4. In a liquid dispenser, a threaded closure cap, a centrally extended tubular casing secured to the cap and having a closed inner end and an opening in its side, a tubular plunger slidably mounted in the casing and having longitudinal slots in its sides, a pin carried by the casing and extended through the slots, a spring within the casing and tube and having one end positioned against the end of the tube and the other against the pin carried by the casing, a valve chamber within the outer end of the plunger tube and having an inlet opening and covering the discharge outlet, and a spring-actuated valve closing the inlet opening.

DONALD L. SPENDER.