

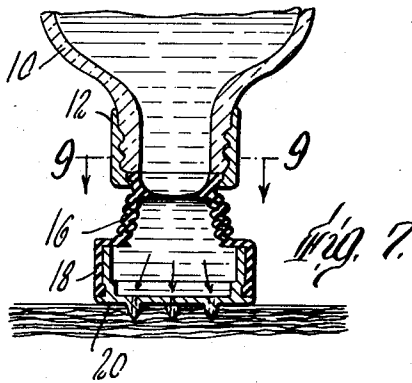
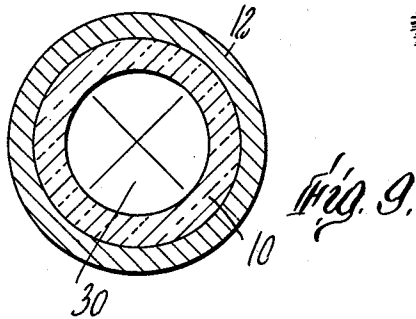
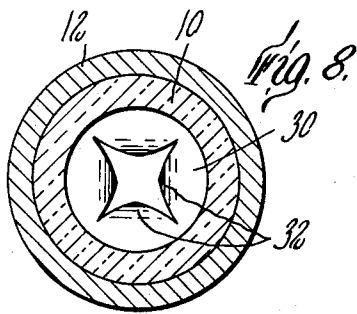
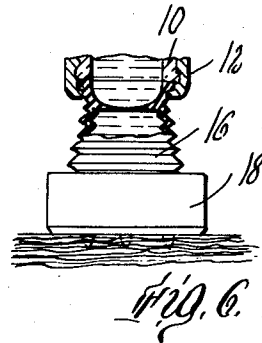
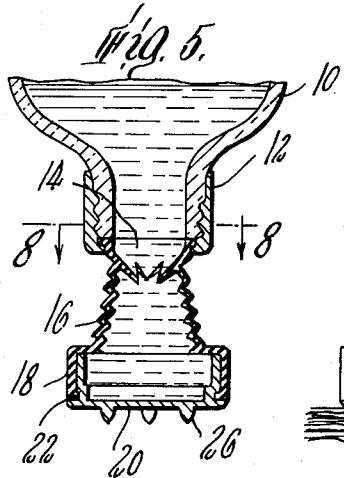
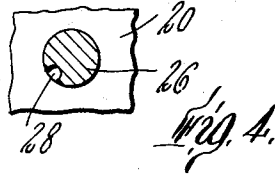
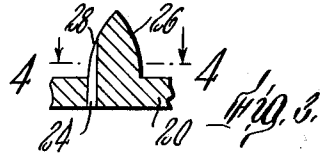
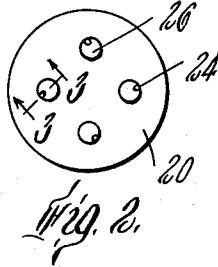
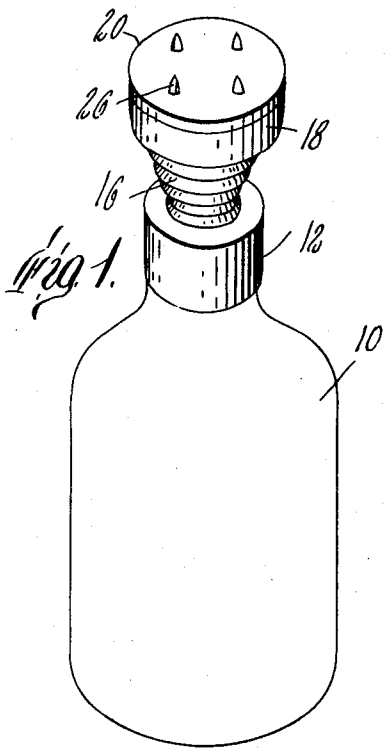
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2,939,615

DISPENSER

Filed July 11, 1957



1

2,939,615

DISPENSER

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5 Claims. (Cl. 222-207)

This invention relates to a device for dispensing fluid material and pertains more specifically to such a device for dispensing and applying hair treating material to the hair.

One object of the invention is to provide a dispensing device readily mounted on a conventional bottle or container and adapted to provide a pumping action for dispensing the material contained therein.

A second object is to provide a dispenser of the type described which is useful for dispensing fluid materials having a wide range of viscosities.

Still another object is to provide a dispenser of simplified and inexpensive construction which is durable and positive acting.

Other and further objects will be apparent from the drawing and from the description which follows.

In the drawing:

Fig. 1 is an isometric view showing one embodiment of the present invention mounted upon a conventional liquid container;

Fig. 2 is a plan view of the embodiment of Fig. 1;

Fig. 3 is a view in section taken along line 3-3 of Fig. 2;

Fig. 4 is a view in section taken along line 4-4 of Fig. 3;

Fig. 5 is a view in cross section, partly broken away, showing the embodiment mounted on a container and showing the dispenser in its normal expanded condition;

Fig. 6 is a view in side elevation, partly broken away and in section, showing the dispenser at the beginning of the compression cycle;

Fig. 7 is a view in cross section, partly broken away, showing the dispenser in its fully compressed condition;

Fig. 8 is a view in section taken along line 8-8 of Fig. 5 showing the valve member in open position; and

Fig. 9 is a view in cross section taken along line 9-9 of Fig. 7 showing the valve member in closed position.

As appears in the drawings, the dispenser of the present invention may be mounted upon any conventional container such as bottle 10 which may be provided, for example, with a screw-threaded neck. The dispenser itself may be mounted on the neck of bottle 10 by means of a cap member 12 which is internally threaded for mounting on the neck of the bottle. It will be understood, of course, that any other suitable connection such as a snap fit between cap 12 and bottle 10 may be employed when desired. Cap 12 is provided with an opening 14 through its top. Mounted on cap 12 and communicating with the cap through the opening in the top is an ejection chamber having a compressible, flexible, resilient bellows wall member 16 which extends upwardly from cap 12 when the device is not in use, as shown in Fig. 1. Bellows wall member 16 is normally biased to an expanded position by the inherent flexibility and resiliency thereof, as shown in Figs. 1 and 5, but may be compressed by urging it against cap member 12, as shown in Figs. 6 and 7. Mounted on the outer end of bellows wall member 16 is a generally cylindrical open

2

socket 18 adapted to receive and hold an outlet plate 20, member 18 being provided with inwardly extending lip 22 at its outer margin which seats in an annular groove in the wall of outlet plate 20.

5 In the embodiment shown in the drawings, outlet plate 20 is provided with a plurality of small apertures 24, 24 which are spaced apart from each other and which permit the liquid contents of the ejection chamber socket to be dispensed therethrough. Mounted on the 10 outer face of plate 20 adjacent each aperture 24 is a generally conical projection 26, along one side of which a groove 28 extends which is in registration with an aperture 24, as shown best in Figs. 2, 3 and 4.

Mounted within the inlet of the ejection chamber and 15 secured to the bellows wall member 16 adjacent cap member 12 is a check valve member 30 comprising four radially inwardly extending, generally triangular, flexible, resilient flap members 32, 32. These flap members are normally biased to open position as seen in 20 Figs. 5 and 8 and are so arranged that when pressure is applied to the flap members by initiation of compression of the bellows wall 16, the members 32 are urged to a generally horizontal position as seen in Figs. 6, 7 and 9 in which they mate with each other to seal substantially 25 completely the inlet passageway.

The members 32 are joined to each other at their margins and are arranged in generally conical form as seen in Fig. 5 with the margin of bellows wall member 16 being mounted on the outer conical face thereof between the apex and the base of the cone. Members 32 30 are constructed of a flexible, resilient, compressible, rubber-like material and are more readily flexed to closed position, as seen in Figs. 6, 7 and 9, than is bellows wall member 16. Preferably, members 32, bellows wall 35 member 16 and outlet plate socket 18 are all molded integrally with each other from a single mass of rubber-like material, in which case the wall thickness of members 32 is preferably less than the thickness of the wall of bellows member 16 in order to provide for 40 prompt flexing of members 32 to closed position as compression of bellows member 16 is initiated and before it has proceeded very far, as shown in Fig. 6.

In operation of the device, the desired fluid material is placed in container 10 and the dispenser is mounted 45 on the neck of the container as shown in Fig. 1. The container and its dispenser are then inverted and outlet plate 20 is pressed against the hair, which may be, for example, in the form of a pin curl, so that projections 26 are urged between the individual hair fibers, thus 50 parting and opening the hair tress. During this initial operation the liquid treating material flows through opening 14 in cap member 12 and through valve member 30, filling the interior of the ejection chamber up to outlet plate 20, as seen in Fig. 5. As the device continues to be pressed gently against the hair, bellows wall member 16 transmits this pressure to the wall of valve member 30, forcing members 32 to closed position as seen in 55 Fig. 6. As the pressure against the hair continues, bellows wall member 16, which is stiffer than the walls of valve member 30, is compressed to the folded position shown in Fig. 7. This compression is accompanied by a reduction in volume of the ejection chamber, and since 60 valve 30 is closed during the compression of bellows wall member 16, the liquid material enclosed within the ejection chamber is forced outwardly through apertures 24, 24 and along grooves 28, 28 into the interior of the hair tress between the individual fibers thereof. Upon 65 release of the pressure the device regains the position shown in Fig. 5, whereupon the operation may be repeated.

70 It will be understood that the number, size, location and spacing of apertures 24, 24 and projections 26, 26

3

may be varied as desired depending upon the nature and viscosity of the hair treating material to be dispensed.

It will be understood, of course, that cap member 12 and outlet plate 20 may also be made integral with the remainder of the dispenser if desired, although in the preferred embodiment illustrated above they are made of a relatively hard, rigid, plastic material such as polystyrene, a thermoset resin or the like, while the valve member 30, bellows wall member 16 and socket member 118 are all formed of a rubbery, resilient, elastic material.

Although specific embodiments of the invention have been described herein, it is not intended to limit the invention solely thereto, but to include all of the obvious variations and modifications within the spirit and scope of the appended claims.

What is claimed is:

1. A device for dispensing fluid material comprising a compressible chamber having a flexible resilient wall member in the form of a bellows biased to an expanded position by the inherent flexibility and resiliency of the wall member and compressible to a folded condition, said chamber being adapted to be connected to a supply of said fluid material and having an inlet adjacent one end of said bellows wall member and an outlet for said fluid material adjacent the other end, and a valve mounted in said inlet operatively connected to said wall member, said valve having means normally biased to open position and movable to closed position by said wall member upon initiation of compression of said bellows.

2. A device for dispensing fluid material comprising a cap adapted for mounting on a container of said material, a compressible chamber having a flexible resilient wall member mounted on and extending upwardly from said cap, said wall member being in the form of a bellows biased to an expanded position by the inherent flexibility and resiliency of the wall member and compressible to a folded position, an outlet for delivery of said fluid material adjacent the end of said chamber remote from said cap, an inlet between said cap and

4

chamber, and a check valve interposed between said inlet and outlet for controlling the flow of fluid material therethrough, said valve being biased to normally open position when the bellows is biased to an expanded position and being connected to said bellows wall member whereby the valve is urged to closed position when the bellows begins to be compressed.

3. A device for dispensing fluid material comprising a cap adapted to be removably attached to a bottle neck, said cap having an opening through its top, an ejection chamber mounted on said cap communicating therewith through said opening, said chamber having a flexible integral one-piece resilient wall member in the form of a bellows biased to an expanded position by the inherent resiliency of said wall member, an outlet in the wall of said ejection chamber, and a valve interposed between said cap and chamber, said valve including a plurality of flexible resilient radially extending flaps normally biased to open position and movable to closed position by compression of said bellows, the flexibility of said flaps being greater than the flexibility of said bellows whereby said flaps are moved to closed position near the beginning of the compression of said bellows.

4. A device as defined in claim 3 in which said outlet comprises a generally flat plate member provided with a plurality of small spaced-apart apertures therethrough.

5. A device as defined in claim 3 in which said flaps are normally disposed in generally conical configuration and extend inwardly from said bellows wall member.

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