Oct. 2, 1956 H. W. WILLIAMS 2,765,004

DROPPER ASSEMBLY

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Fig. 1

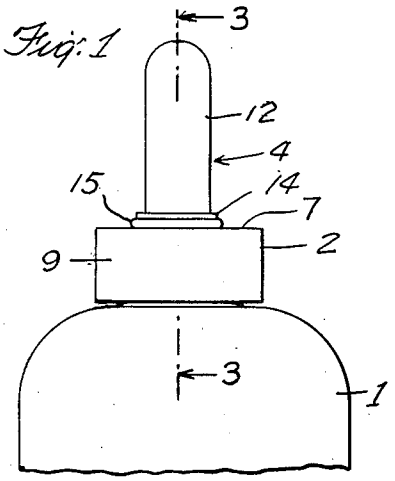


Fig. 2

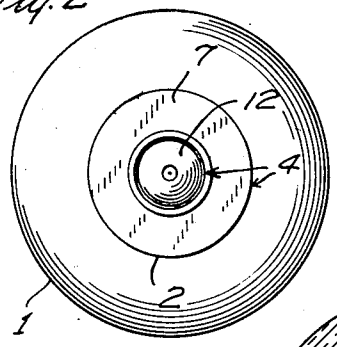


Fig. 3

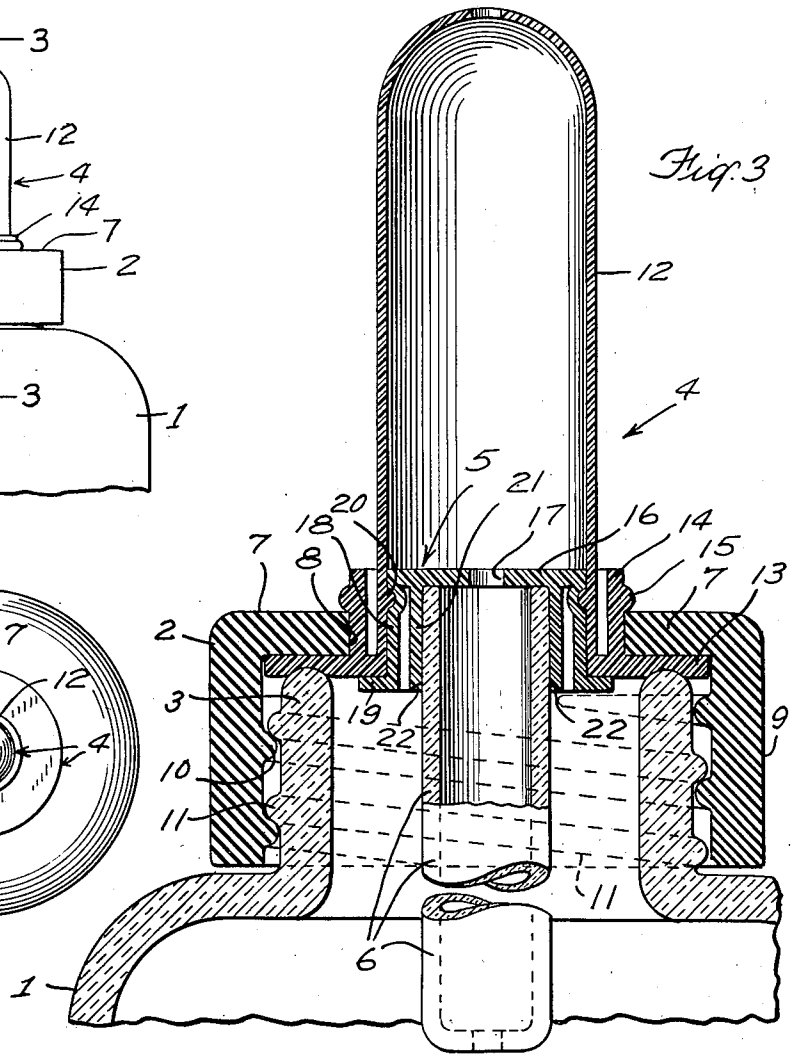


Fig. 5.

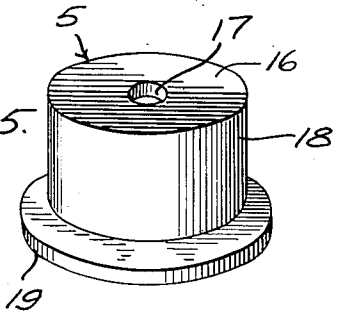
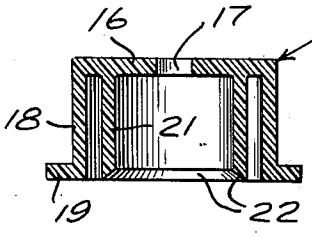


Fig. 4.



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DROPPER ASSEMBLY

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6 Claims. (Cl. 141—24)

The invention herein disclosed relates to a dropper assembly of the kind that is combined with a bottle cap.

An object of the invention is to provide an improved dropper construction that is readily and easily assembled, thereby reducing the cost of manufacture. Another object of the invention is to provide a dropper assembly that utilizes a smooth-surfaced hollow rod. A further object of the invention is to provide a durable dropper assembly that is inert to most substances.

The foregoing objects and certain advantages that will hereinafter appear are realized in the embodiment of the invention illustrated in the accompanying drawing in which Fig. 1 is a side elevation of a dropper assembly applied to a bottle; Fig. 2 is a plan of the same; Fig. 3 is a longitudinal axial elevation on an enlarged scale; Fig. 4 is a longitudinal axial elevation of an insert that forms part of the assembly; and Fig. 5 is an isometric of the insert.

The dropper assembly is illustrated in the drawing applied to a bottle 1. In the embodiment shown, the assembly includes four parts: a bottle cap 2 shown threaded on the neck 3 of the bottle 1; a bulb, designated generally by the numeral 4, extending through the bottle cap; an insert 5 within the bulb; and a hollow rod 6 extending into the insert 5.

Any material that is substantially rigid at ordinary temperatures may be used for the cap 2. Conveniently, the cap is a molded plastic piece formed from a plastic that is rigid at ordinary temperatures. It includes an end wall 7 that has an opening 8 therethrough, and a cylindrical skirt 9 extending from the end wall. On the inner surface of the skirt, there is an inwardly extending, helical bead 10 that engages a like, external, helical bead 11 on the neck 3 of the bottle. Rigidity in the cap is desirable to prevent the bead 10 from stripping or slipping over the engaging bead 11 on the neck of the bottle when the cap is tightly screwed on to the bottle.

The bulb 4 is molded from a thermoplastic that is flexible at ordinary temperatures. Polyethylene has been found to be ideally suitable for the bulb. It is flexible at ordinary temperatures, durable and inert to practically all substances dispensed by a dropper. It does not become brittle with age, and repeated flexing does not affect it. In addition, upon being flexed or compressed and released, it returns to its original molded shape.

As illustrated, the bulb includes a bulb portion 12 of relatively thin wall section that may be compressed between one's fingers. At the open end of the bulb portion, there is an outwardly extending integral flange 13 that engages the inner surface of the end wall 7 of the cap 2. The flange 13 is relatively thicker than the wall of the bulb portion and serves the dual purpose of engaging the inner surface of the end wall 7 of the cap 2 to prevent the bulb from being drawn through the opening 8 in the end wall 7, and acting as a seal against the edge of the neck 3 of the bottle. Since the material from which the bulb is molded has the characteristics mentioned, the edge

of the neck compresses the flange 13 when the cap is tightly screwed thereon and a fluid tight seal is effected. In this respect, it is to be noted that the flange 13 is of substantially the same diameter as the internal diameter of the cap.

Extending from the flange 13, there is an integral, upstanding cylindrical skirt 14 about and slightly spaced from the end section of the bulb portion. This skirt 14 is somewhat thicker than the wall of the bulb portion. It extends through the opening 8 through the end wall 7 of the cap. Adjacent the free end of skirt 14, there is an outwardly extending circumambient bead 15 that engages the outer surface of the end wall 7 of the cap 2. Thus, by the flange 13 and the bead 15, the bulb 12 is secured to the cap 2.

The insert 5 also consists of a single piece molded from polyethylene. In the embodiment illustrated, this insert includes an end wall 16 having an opening 17 therethrough, and a cylindrical skirt 18 extending from the end wall. At the free end of the skirt 18, there is an outwardly extending circular flange 19 that engages the flange 13 of the bulb. The insert extends into the end section of the bulb and is of a diameter such as to effect a press fit with the inner surface of the bulb portion. In addition, to insure retention of the insert in the end section of the bulb portion, the bulb portion is provided with an inwardly extending bead 20. The location of the bead 20 is such that when the insert is in place, it engages and compresses the skirt 18 of the insert adjacent its conjunction with the end wall 16. The flange 19 is of such diameter as to be received within the opening of the neck of the bottle with which the assembly is used. Thus, it does not interfere with the flange 13 acting as a seal.

Within the skirt 18, there is, spaced therefrom, a cylindrical extension 21 extending from the end wall 16. The extension 21 is of substantially the same length as the wall 16 and has an internally tapered end 22. This extension receives the end of the hollow rod 6 which is a smooth surfaced glass tube. The internal diameter of the extension 21 is slightly smaller than the external diameter of the tube 6 so that the extension is slightly expanded when the tube is inserted therein. The engagement between the extension 21 is thus such as to retain the tube in the extension and provide an air tight fit with the tube.

With the arrangement shown and described above, the parts are readily assembled. This may be done in any order. For example, the tube 6 may be assembled in the insert 5; the insert with the tube therein then inserted in the bulb; and, finally the bulb inserted through the opening 8 in the cap. As there is no bead or other protuberance on the tube, and the skirt 14 is flexible, no particular manipulation is required in assembling the parts; they are readily and easily pressed into place.

From the foregoing description of the embodiment of the invention illustrated in the drawing, it will be apparent that by this invention there is provided a simple, comparatively inexpensive dropper assembly that utilizes a smooth surfaced hollow rod and that is inert to practically all substances with which such droppers are used.

It will be obvious that various changes may be made by those skilled in the art in the details of the dropper assembly illustrated in the drawing and described above within the principle and scope of the invention as expressed in the appended claims.

I claim:

1. A dropper assembly of the kind described comprising in combination a bulb consisting of a single piece of flexible, plastic material and including a compressible bulb portion and a circumambient, outwardly extending flange at the open end thereof, an insert extending into the bulb portion consisting of a single piece of flexible, plastic material and including an end wall having an opening

therethrough, a cylindrical skirt and an outwardly extending flange at the open end thereof engaging the edge of the bulb portion, the said outwardly extending flange on the insert being of lesser diameter than the flange on the bulb portion, and a hollow, smooth-surfaced rod having one end received within the said insert and engaging the end wall thereof.

2. A dropper assembly of the kind described comprising in combination a bulb consisting of a single piece of flexible plastic material and including a compressible bulb portion and a circumambient, outwardly extending flange at the open end thereof, an insert extending into the bulb portion consisting of a single piece of flexible, plastic material and including an end wall having an opening therethrough, a cylindrical skirt and an outwardly extending flange at the open end thereof engaging the edge of the bulb portion, the said outwardly extending flange on the insert being of lesser diameter than the flange on the bulb portion by at least the thickness of the neck of the bottle with which the dropper is used, whereby the flange on the bulb portion acts as a seal, and a hollow, smooth-surfaced, glass rod having one end received within the said insert and engaging the end wall thereof.

3. A dropper assembly of the kind described comprising in combination a bottle cap including an end wall and a skirt extending from the end wall, the end wall having an opening therethrough, and a bulb consisting of a single piece of flexible, plastic material and including a bulb portion extending through the opening in the end wall of the cap, a circumambient, outwardly extending flange at the open end of the bulb portion engaging the inner surface of the end wall of the cap and a cylindrical skirt about the end section of the bulb portion extending through the opening in the end wall of the cap and having an external bead at the end thereof engaging the outer surface of the end wall of the cap.

4. A dropper assembly of the kind described comprising in combination a botle cap including an end wall and a skirt extending from the end wall, the end wall having an opening therethrough, and a bulb consisting of a single piece of flexible, plastic material and including a bulb portion extending through the opening in the end wall of the cap, a circumambient, outwardly extending flange at the open end of the bulb portion engaging the inner surface of the end wall of the cap and a cylindrical skirt about the end section of the bulb portion extending through the opening in the end wall of the cap and having an external bead at the end thereof engaging the outer surface of the end wall of the cap, an insert extending into the bulb portion consisting of a single piece of flexible, plastic material and including an end wall having an opening therethrough, a cylindrical skirt and an outwardly extending flange at the open end thereof engaging the edge of the bulb portion, and a hollow rod having one end received within the said insert and engaging the end wall thereof.

5. A dropper assembly of the kind described comprising in combination a bottle cap including an end wall and a skirt extending from the end wall, the end wall having an opening therethrough, and a bulb consisting of a single piece of flexible, plastic material and including a bulb portion extending through the opening in the end wall of the cap, a circumambient, outwardly extending flange at the open end of the bulb portion engaging the inner surface of the end wall of the cap and a cylindrical skirt about the end section of the bulb portion extending through the opening in the end wall of the cap and having an external bead at the end thereof engaging the outer surface of the end wall of the cap, an insert extending into the bulb portion consisting of a single piece of flexible, plastic material and including an end wall having an opening therethrough, a cylindrical skirt and an outwardly extending flange at the open end thereof engaging the edge of the bulb portion, the said outwardly extending flange on the insert being of lesser diameter than the flange on the bulb portion by at least the thickness of the neck of a bottle with which the dropper is used, whereby the flange on the bulb portion acts as a seal, and a hollow, smooth-surfaced rod having one end received within the said insert and engaging the end wall thereof.

6. A dropper assembly of the kind described comprising in combination a bulb consisting of a single piece of flexible, plastic material and including a compressible bulb portion and a circumambient, outwardly extending flange at the open end thereof, an insert extending into the bulb portion consisting of a single piece of flexible, plastic material and including an end wall having an opening therethrough, a cylindrical skirt and an outwardly extending flange at the open end thereof engaging the edges of the bulb portion, and a cylindrical extension within the skirt and spaced therefrom, and a hollow smooth-surfaced rod having one end received within the extension and engaging the end wall of the insert.

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