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3,145,879

CONTAINER WITH SELF CONTAINED DISPENSING MEANS

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Fig. 1.

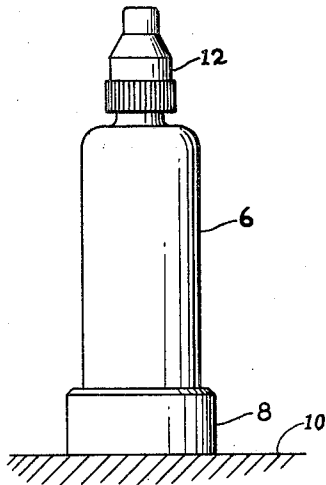


Fig. 2.

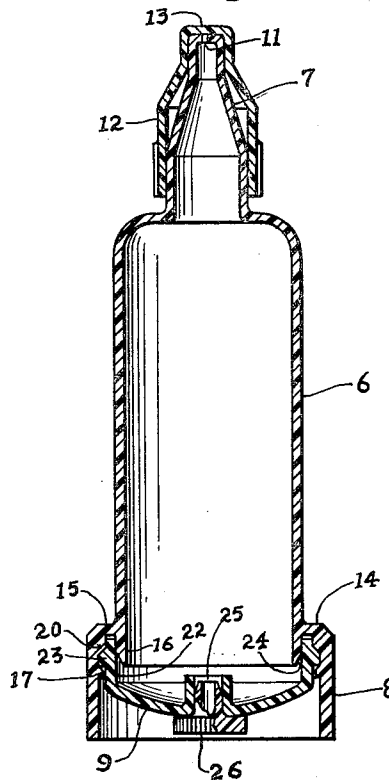


Fig. 3.

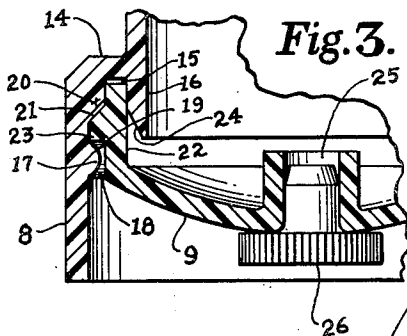
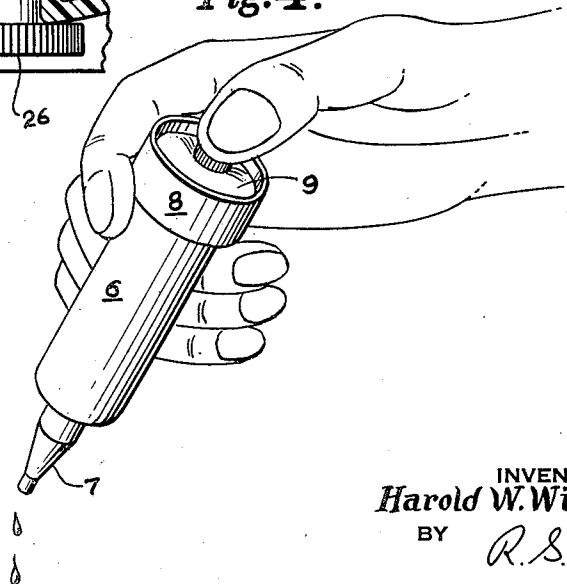


Fig. 4.



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CONTAINER WITH SELF CONTAINED DISPENSING MEANS

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2 Claims. (Cl. 222-184)

My invention relates to a container with self contained dispensing means and particularly to a container having a relatively rigid body or side wall as distinguished from, for example, a paste tube or a squeeze bottle having flexible side walls. There are, of course, several advantages of rigid containers including their general stability in filling, handling, and storing.

One object of the invention is to provide an improved container which incorporates its own dispensing device in such a manner that the contents are not likely to be discharged accidentally or unintentionally.

Although my improved container may be adapted for use with powder or any substance which it is desired to dispense in small quantities or doses, it is especially well suited for use as a dropper which can dispense one or more drops directly from the original container and under accurate control. Here it eliminates the need for a primary seal as required in bottles having caps with droppers attached.

It is a further objective to provide a container having all the advantages above referred to, which is of simple construction with a minimum number of pieces, and which readily lends itself to economical filling by automatic machinery.

Other objects and advantages of the invention will hereinafter more fully appear.

In the accompanying drawings I have shown for purposes of illustration one embodiment which my invention may assume in practice.

In the drawing:

FIG. 1 shows a complete container in side elevation.

FIG. 2 is a vertical central cross-section.

FIG. 3 is a fragmentary section of the bottom portion on an enlarged scale.

FIG. 4 illustrates how the container is used in dispensing drops.

The example of my improved container and self contained dispensing means which is shown in the drawing may be generally described as having a main hollow cylindrical body portion 6, which a reduced nozzle-like end 7, a larger diameter hollow base 8, and a diaphragm 9 mounted wholly inside the base 8 for closing the bottom end of the container. The base is adapted to hold the container in an upright position while resting on a flat surface 10 of a shelf or the like, as indicated in FIG. 1, and for the sake of convenience, some of the descriptive terminology will apply to the container while in this position.

The applicator or nozzle-like end 7, the body portion 6, and the base 8 are integral so that they may be molded as one piece from a suitable plastic material. Such material and the walls of the container may be described as rigid, or relatively rigid to the extent that there will be no substantial deformation or flexing in the normal handling and use of such devices. It is not meant to include a material as hard or as rigid as glass, which would not be suitable for the purposes of my invention because, among other reasons, it could not be formed in any practical way with the required accuracy of dimensions. One very satisfactory material for the molding of this part has been found to be linear polyethylene, which is a term used in the trade to designate a polyethylene of distinctly higher density than so-called regular polyethylene which is a

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pliable plastic material that is quite flexible, especially in comparatively thin sections. Thus, regular polyethylene is well suited for the diaphragm 9, not only because it permits easy flexibility, but also because it will conform readily to the interior of the hollow base to effect a tight seal in a manner which will further be explained.

The applicator end 7 may be of any desired shape depending on the end use intended, and is herein shown as tapering to a small diameter tip having an aperture 11. This may be effectively closed when not in use by a suitable cap 12, made preferably of regular polyethylene and having an end wall 13, sealing off the aperture 11, and the cap may have a friction fit over portions of the reduced end extension 7 as shown.

The base 8 is of substantially larger transverse area than the body portion 6, and while it may have any desired outside configuration, it is herein shown round to provide a cylindrical wall which is preferably of substantially larger inside diameter than the outside diameter of the body portion 6. The base is joined to the body portion a substantial distance above its end by a transversely extending wall or shoulder 14 providing an annular downwardly facing channel 15 between the base wall and the bottom extension 16 of the cylindrical wall 6. One advantage of the upwardly facing outer shoulder provided by the transverse wall 14 is to facilitate hopping, guiding and supporting the containers (in upside down position) as between two guide rails, for automatic filling and assembly of the diaphragm.

Spaced a considerable distance from the bottom edge of the base 8 is an interior circular rib 17 and in cross-section this rib presents an angular or rounded lead-in lower surface 18 and an upwardly directed shoulder 19 which may also be somewhat angled or rounded to facilitate withdrawal from the mold. The upper portion 20 of the base wall is of increased thickness so as to leave, in effect, a circular groove between the bead 17 and the portion 20 and the upper face 21 of this groove is beveled in the manner of a valve seat.

The diaphragm element has the downwardly domed disc-like portion which extends across the entire bottom opening, and the upwardly extending skirt 22 by which it is held in place. This skirt portion is formed with an exterior circular rib 23 with a beveled upper surface complementary to the beveled surface 21 in the base.

While being filled the container will normally be held in upside down position by suitable supporting means engaging behind the shoulder 14. After filling, and while so supported, the container is closed by placing the diaphragm in position and applying endwise pressure around its outer edge or skirt portion, which is in alignment with the supporting shoulder 14. The rib 23 of the diaphragm will snap into position behind the rib 17 on the container with its beveled upper surface seating on the upper surface of the groove in the container base to effect a seal. Sealing is further assured by the upper edge of the skirt 22 fitting tightly in the channel 15, and to assist in leading the skirt into this channel the lower edge of the cylindrical wall extension 16 is beveled as indicated at 24. Due to the nature of the assembly as described, there is likelihood of air being trapped behind the diaphragm which would tend to dislodge it. To overcome this difficulty a vent opening 25 may be formed in the diaphragm which can be closed after filling, by the plug 26.

It will be seen the entire diaphragm element, including the plug 26, is housed within the base of the container. It is thus protected from contact with adjoining articles so as to avoid accidental discharge of the contents. At the same time it is very convenient to use as a dropper in the manner indicated in FIG. 4.

What I claim as new and desire to secure by Letters Patent is:

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1. A container of the class described comprising a hollow body portion with a cylindrical side wall, an integral nozzle-like reduced upper end, a hollow supporting base having an inside diameter larger than the outside diameter of said body portion, a transversely extending annular wall which integrally joins said base to the body portion a substantial distance above the bottom end of said body portion cylindrical wall to provide an annular downwardly facing channel and also an external shoulder, said body portion, reduced upper end and base consisting of a single piece of relatively rigid material; a one-piece downwardly domed diaphragm of flexible material having a cylindrical skirt which extends into said channel, and interengaging rib and groove means integral with the interior of said base and exterior of said skirt for locking the diaphragm in place, said diaphragm being wholly above the level of the bottom edge of said base to prevent accidental manipulation thereof.

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2. A container as described in claim 1 wherein the main piece consisting of said body portion, nozzle-like end and base is a moulding of relatively rigid plastic material such as linear polyethylene and the diaphragm is of pliable plastic material such as regular polyethylene and where there is also provided a cap for the nozzle-like end also consisting of pliable material.

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