Aug. 29, 1961 R. S. SCHULTZ 2,997,731

BALL-TYPE DISPENSER

Filed Dec. 18, 1959

Fig. 1.

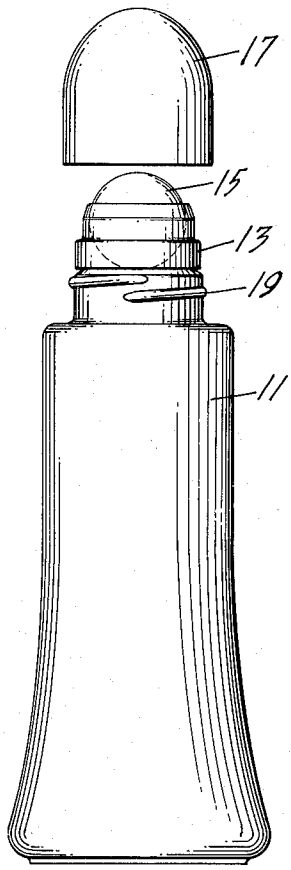


Fig. 2.

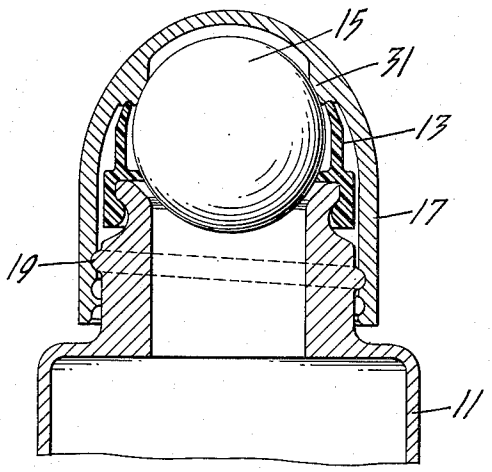
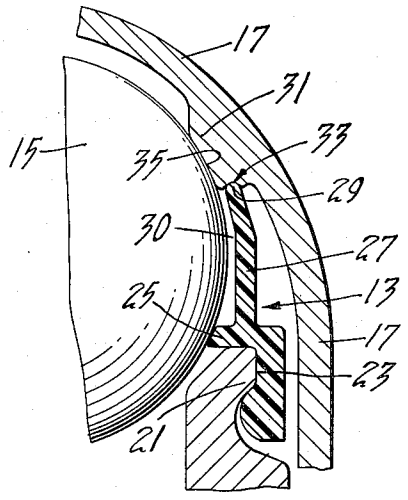


Fig. 3.



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United States Patent Office 2,997,731 Patented Aug. 29, 1961

2,997,731

BALL-TYPE DISPENSER

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Filed Dec. 18, 1959, Ser. No. 860,403
5 Claims. (Cl. 15—572)

This invention relates to dispensing packages, and especially to those having an attached applicator of the ball or "roll-on" type.

There have appeared on the market a number of such dispensers in which the ball is housed in a ring of stiff but somewhat resilient plastic material such as polyethylene, and these have proved fairly effective in operation up to a point. One of the main problems, however, arises from the fact that many products such as deodorant lotions have the property of drying between the ball and the housing so that the ball is no longer mobile and its intended operation is defeated.

One approach to a solution of this problem has been to attempt to provide a seal between the overcap and the container neck or shoulder which will exclude air and prevent the drying. However, structures along this line developed to date have not proved entirely reliable.

Another approach is illustrated in United States Patent 2,749,566 wherein means on the overcap is designed to engage against the upper lip of the flexible plastic ball housing and cam or otherwise force the same into peripheral sealing contact with the ball so as to seal off the space between the ball and housing whether the overcap seals firmly against the container neck or not. In certain respects this approach has proved fruitful. However, it has been discovered that when certain resilient or semi-resilient plastics such as polyethylene are subject to physical deformation for extended periods, their flow characteristics are such that they no longer recover as well as could be desired. Accordingly, when containers operating on the principle of the said patent have been standing for extended periods, e.g. in storage, the lip of the ball housing tends to become distorted and undersized in inner diameter, so that the metering passage between the ball and the housing may become undersized or disappear with the consequence that interference with proper dispensing of the product is noted.

It is an object of the present invention, therefore, to provide a ball or roll-on dispenser arrangement in which the space between the ball and the housing can be easily and reliably sealed to prevent drying out of the product therein and freezing of the ball, but in which no serious distortion of the lip of the housing results from the sealing action, so that proper dispensing can be expected even when the container stands in sealed condition for extended periods.

According to the present invention this object is achieved by providing a plastic housing for the ball having an upstanding wall with a narrow upwardly directed free edge or lip lying closely adjacent the ball surface but spaced slightly therefrom to properly meter the product, and an overcap for threaded connection with the container neck and constructed with a downwardly facing seating groove for said lip dimensioned to match the lip diameter so as to make sealing engagement therewith and also to firmly fasten the lip in its designed position so that the possibility of distortion due to sealing is prevented.

Additional objects, features and advantages will appear hereinafter as the description proceeds.

In the drawing:

FIG. 1 is an exploded elevation of a container and ball dispenser according to the present invention, together with an overcap therefor;

FIG. 2 is a section to a larger scale of the neck portion of the container of FIG. 1 showing the ball retainer ring and the overcap in sealing position;

FIG. 3 is a detail section to a still larger scale illustrating particularly the nature of the engagement between the overcap and the lip of the ball retainer ring.

Referring to the drawing, the present invention is concerned with dispensing containers such as container **11** arranged to hold a flowable product. To this end the mouth of the container is closed by a fitting or housing **13** in which is carried and loosely retained a ball **15** usually of rigid material such as glass or a rigid organic plastic. An overcap **17** is shown for covering the ball when not in use, and the same is designed for threaded connection with the threads **19** on the neck of the container or on the fitting **13**, in this case shown as being on the former.

In the presently disclosed form of the invention, the fitting **13** is a ring of resilient plastic material, for example polyethylene. The mouth of the container is provided with an exterior peripheral rib **21** while the ring **13** has a matching internal groove **23** so that the two can be joined by a snap fit providing a good seal against accidental escape of the product and making the ring **13**, in effect, an extension or continuation of the container neck. At about the level of the container mouth, the ring **13** carries an inwardly extending ledge or flange **25** whose internal diameter is slightly less than the diameter of the ball **15** so that the latter will be supported therein. Above the ledge **25**, the ring comprises a cylindrical wall **27** which embraces the midsection of the ball and has a top opening slightly smaller in diameter than the ball diameter so that the ball must be forced into place within fitting **13** and is retained therein until intentionally forced out of the ring **13**.

The ring is kept as nearly as possible to the size of the ball, with the wall **27** and especially the free upper lip or edge **29** thereof being kept as thin and as smooth as possible to prevent interference with parts of a receiving surface which the user seeks to bring into contact with the ball for application of the product thereto, especially for application of lotions or the like to soft parts of the person of the user.

It can be seen that within the wall **27**, and between the same and the ball **15** is small annular chamber, **30**, semi-capillary in radial dimension, which will hold a small amount of the product to be dispensed and keep the surface of the ball moistened therewith.

In order to seal this chamber against evaporation during storage, the overcap **17**, which is preferably although not necessarily of rigid material, is formed with an annular internal boss **31**. The boss has a lower transverse surface which is formed with a downwardly facing groove **33** dimensioned precisely to meet and engage with the rounded upper edge **29** of the wall **27** and to apply a downward sealing pressure thereto and simultaneously to locate and rigidly retain the edge **29** at the exact spacing with respect to the ball surface which it normally enjoys in free condition. The boss **31** is shown as including also a spheroidal or frustoconical inner surface **35** which may engage with the ball **15** and help to center the same in the ring **13**, but it will be understood that the engagement between lip **29** and groove **33** is the one of primary importance. It can be seen that the engagement of the surface **35** with the ball is less critical than the engagement between the groove **33** and the lip **29**, for the former engagement can, to some extent, depress the ball against the resilient action of the flange **25** until the groove and lip are properly seated, the latter within the former.

In operation the container **11** is filled with product, the fitting **13** is snapped over the neck of the container

with its groove **23** sealingly receiving the annular rib **21** thereof. The ball **15** may be snapped into the ring **13** either before or after its installation on the container **11**. When the container is used by inverting it and rolling the ball **15** over a surface to which the product is to be applied, the chamber **30** becomes filled with the product which then remains within the chamber when the container is again turned upright. When it is desired to close the container for storage, the overcap **17** is placed on the neck, and threaded downwardly on the threads **19** of the container neck. This brings the locating and sealing groove **33** of the overcap into sealing relationship with the lip **29** of the ring **13**, closing off the chamber **30** to outside air. Thus the product in the chamber **30** remains moist and usable and when the cap is removed for the next use, the ball **15** will be in freely rotatable condition. Likewise the lip **29** is firmly held against any distortion which might impair its effectiveness for metering the product in case the overcap should be left in place for an extended period, as in the case of warehouse or shelf storage before sale.

While the present invention has been particularly described with regard to a resilient ring or attachment for a rigid container, it will of course be understood that the principles set forth are equally applicable to an arrangement wherein the ball holding and supporting portions are formed integrally with and as a part of a resilient plastic container.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A dispensing device comprising a container having a neck, a portion of which includes a housing of stiff but resilient plastic material; a dispensing ball loosely supported in said housing, the housing having a thin upstanding wall surrounding the ball and defining between the ball and itself an annular reservoir for product to be dispensed and terminating in a circular lip slightly smaller in diameter than the diameter of the ball to retain the same within said housing with a minor portion of the ball protruding therebeyond for dispensing contact with a receiving surface; an overcap engaged with said neck; mutually engageable retention means on said overcap and neck for holding the overcap in a closed position on said neck, and an annular formation on the interior of said overcap presenting a downwardly facing configuration complementing the configuration of said lip and sealably engaging the same when the overcap is in closed position, said complementary means being dimensioned to immobilize said lip in substantially its normal free dimension and configuration, and prevent during storage of the container any deformation of the lip tending to change its relation to the ball.

2. A device as defined in claim 1 in which said neck portion forming the housing is detachable from the container and consists of a ring of stiff but resilient plastic material having a tightly sealing interference fit with the remainder of the container.

3. A device as defined in claim 1 in which the lip of the housing presents in cross section a smoothly rounded nose, and the annular formation on the overcap includes a complementary annular groove of a shape for snugly receiving the nose.

4. A device as defined in claim 3 in which the interior of the cap also includes annular engaging means for guiding the ball into a centered position as the smoothly rounded nose moves into said complementary annular groove in said cap.

5. A device as defined in claim 1 in which the interior of the cap also includes annular engaging means for guiding the ball into a centered position as the circular lip moves into cooperative relation with the downwardly facing annular formation on the interior of said cap.

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