Oct. 27, 1964 J. M. MITCHELL 3,154,116

MEDICINE DROPPER CONSTRUCTION

Filed Dec. 10, 1962

FIG. 1

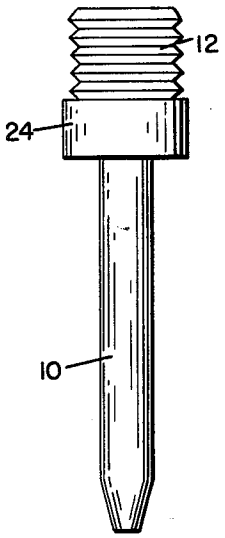


FIG. 2

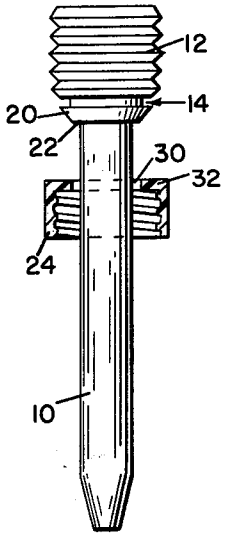


FIG. 3

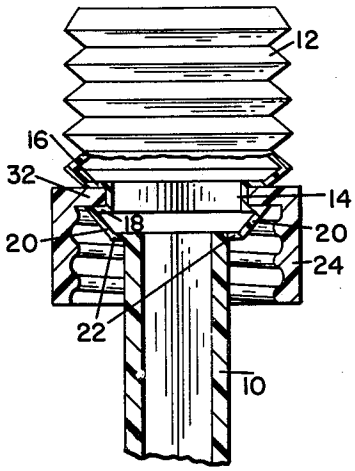
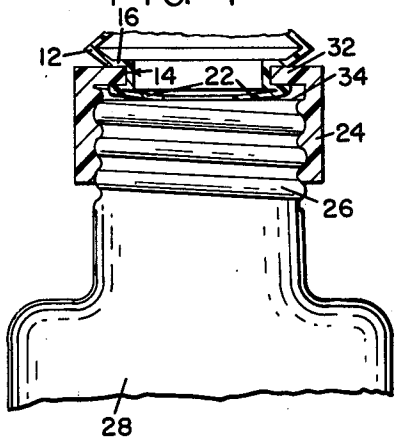


FIG. 4



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MEDICINE DROPPER CONSTRUCTION

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This invention relates to a new and improved medicine dropper, and the principal object of the invention resides in the provision of a molded medicine dropper including a flexible bellows and dropper tube formed in one piece and having means for connection of a threaded bottle cap with respect thereto, said bottle cap connecting means being located between the bellows and the dropper tube and at the same time providing for a completely leakproof seal between the cap and the pouring lip of the bottle to which the cap and dropper are applied.

Further objects of the invention include the provision of a one piece molded medicine dropper including a bellows and tube and also including a mechanical connection for a bottle cap, said connection being a part of the bellows and utilized as a soft collapsible seal for the pouring lip of the bottle, thus completely avoiding the use of any gaskets or the like; and a further object of the invention resides in the provision of a medicine dropper as above described including an indenation extending annularly between the bellows and the dropper tube, said indentation having an initial portion which is yieldable and formed as an inverted hollow, conical construction for quick and easy but substantially permanent connection of the cap thereto, said inverted conical construction, which is yieldable, forming a soft gasket providing for a completely leakproof medicine dropper construction when the same is attached in the usual way to a bottle or other container having a threaded neck for association with the cap.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

FIG. 1 is a view in elevation illustrating the invention;

FIG. 2 is a similar view but showing the cap being assembled with respect to the bellows;

FIG. 3 is a view on an enlarged scale partly in section illustrating the cap in its attached condition relative to the bellows, and

FIG. 4 is a view similar to FIG. 3 but showing the action of the bottle collapsing the new and improved gasket means when the cap is threaded thereto.

Referring to the drawings, there is shown a blow molded one piece medicine dropper unit which comprises an elongated dropper tube or barrel **10** which is substantially rigid and is integrally formed with a collapsible self-sustaining bellows **12**. When it is desired to fill the dropper tube, the bellows is collapsed and then released and it moves back to its expanded condition in order to draw fluid into the tube, whereupon the fluid may be expressed by once again collapsing the bellows.

Just under the bellows there is integrally molded therein a groove or annular recess generally indicated at **14**, this being thin-walled as illustrated in FIG. 3. This indentation joins the bottommost section of the bellows in an essentially flat horizontal annular member indicated at **16** (see FIG. 3) and continues on below the same in a generally flat extension **18**, the annular members **16** and **18** defining between them the annular groove **14**.

At the periphery of the flat annular member **18** the material extends downwardly and inwardly on a bevel which is a part of a hollow inverted conical construction and is indicated by the reference numeral **20**. Another flat area **22** is presented and the construction then proceeds into the dropper tube **10** which is thicker and stronger than the relatively soft flexible walls forming the bellows **12**, recess **14**, conical member **20**, etc.

The bottle cap is indicated by the reference numeral **24** and is interiorly threaded as is well known in order to screw onto the exterior threads **26** of an ordinary bottle **28**. The cap **24** is circular and has a relatively large aperture **30** in the central portion of the top thereof forming an inwardly directed flange at **32**. The cap is substantially rigid whereas as described the bellows of the dropper is flexible although resilient and self-sustaining.

The cap is adapted to be easily assembled with respect to the dropper tube as shown in FIG. 2 by inserting the tube **10** through the opening **30** in the cap and then moving the cap in the direction of the arrow in FIG. 2 so as to cause the inwardly directed flange **32** to impinge upon the beveled surface **20**. Since the material in the beveled or conical area **20** is relatively light, yielding and resilient, a further inwardly directed push on the cap causes it to collapse and the flange **32** seats in the annular recess **14** behind the conical portion **20** and between the flat areas **16** and **18**. Thus the flange **32** of the cap **24** is firmly and resiliently held with respect to the medicine dropper and cannot become accidentally dislodged therefrom. The medicine dropper is clearly usable in the conventional manner with the cap in position.

When the cap and dropper are to be applied to the bottle such as that at **28**, the dropper is inserted in the neck of the bottle and the threads of the cap are brought down into engagement with the threads **26** of the bottle, whereupon the appropriate rotation of the cap causes it to seat on the threaded portion **26** of the bottle. The pouring lip of the bottle indicated at **34** impinges upon the beveled or hollow conical area **20** of the yielding material as above described, and this therefore causes this area of the device to be bodily collapsed upwardly and somewhat inwardly. In any event, the conical area is substantially distorted by this squeezing action, so that the portion thereof at **22** is moved considerably upwardly and the pouring lip at **34** of the bottle is resiliently yieldingly gripped with respect to the portion **20** of the device, thus forming a depressible yieldable and completely leakproof seal.

With the construction as shown and described, the contents of the bottle **28** obviously cannot leak past the cap in any way, and the only place that the contents can then go is into the dropper tube **10**.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. A medicine dropper construction comprising a one-piece plastic barrel, an integral self-sustaining plastic bellows, the bellows being of flexible, thin, yieldable but resilient material, a threaded bottle cap, said cap including a top provided with an aperture centrally located therein, said aperture defining the interior edge of an inwardly directed flange in the top of the cap, an outwardly opening inwardly directed annular recess on the bellows, said recess receiving the inwardly directed flange of the cap and holding the same in substantially permanent relationship with respect thereto, an inwardly converging conical portion on said bellows below the recess, said conical portion being relatively soft, yielding and resilient and substantially covering the flange at the interior of the cap, said cap displacing said yieldable conical portion upon an inwardly directed thrust of the cap relative to said barrel and bellows.

2. A medicine dropper construction for use with a bottle comprising a one-piece plastic barrel and an integral bellows, the bellows being flexible, yieldable and self-sustaining so that it automatically expands upon being released by the operator, an annular recess adjacent the bellows and located between the bellows and the barrel, and a bottle cap having a central aperture in the top thereof, said aperture defining a rim receivable in said annular recess for connecting the bottle cap and the medicine dropper together with the medicine dropper located centrally of the cap, an extension of the bellows located at the side of said recess opposite the bellows and forming one wall of the recess, said extension being hollow and conical in form and having an extent greater than that of the diameter of the rim of the cap, the rim being capable of being snapped over said conical shaped extension and substantially permanently seated in the recess, said conical portion providing a wedge up and over which the cap can be forced to snap the rim of the cap into the annular recess behind said extension, and said extension being depressible and distortable by the application of the cap to the bottle, so that a flexible yielding self-sustaining conical-shaped washer and sealing means is provided between the pouring lip of the bottle and the interior of the cap.

3. The combination of a bottle and a medicine dropper construction, said bottle having a threaded neck and a pouring lip, a cap for said medicine bottle, said cap including a top provided with an aperture centrally located therein, said aperture defining the interior edge of an inwardly directed flange in the top of the cap, an outwardly opening inwardly directed annular recess on the bellows, said recess receiving the inwardly directed flange of the cap and holding the same in substantially permanent relationship with respect thereto, said bellows being thin-walled, yieldable, resilient, and self-sustaining and including a substantially truncated conical portion located within the cap in position to be impinged upon and depressed by the pouring lip of the bottle when the cap is applied to the bottle and turned in the appropriate direction to tighten the cap thereto, said conical portion being also thin-walled, yielding, resilient and deformable but self-sustaining and returning to its original conical position when the cap is released from the bottle.

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