April 23, 1968 J. M. MITCHELL 3,379,196

THREE-PIECE MEDICINE DROPPER TUBE WITH IMPROVED SEALING CONNECTION

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FIG. 2

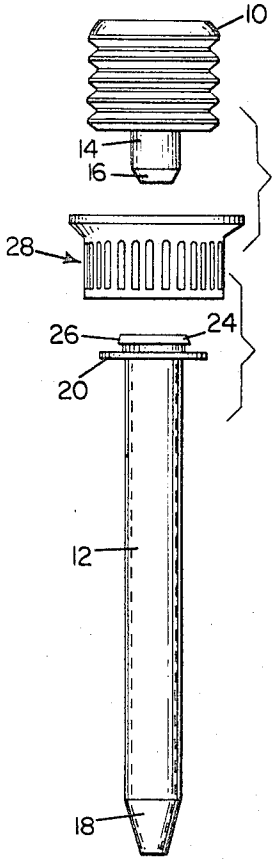


FIG. 1

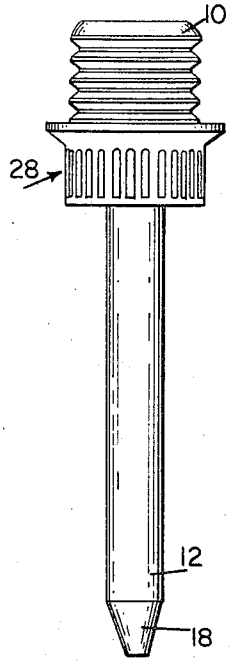
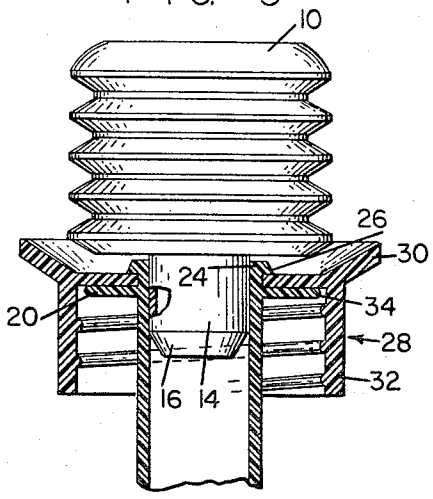


FIG. 3



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ABSTRACT OF THE DISCLOSURE

A three-piece medicine dropper comprising a dropper tube, a bellows at one end thereof, and an attached closure cap, wherein the tube has a short flange at the bellows end and a larger flange spaced therefrom, the closure cap having a central opening having an edge snap-fitted into the space between the flanges, and the bellows has a projection set into the tube in the flange area and tending to swell it outwardly, thus snugly holding all the parts together.

This invention relates to a new and improved medicine dropper, and the principal object of the invention resides in the provision of a molded plastic medicine dropper including a flexible bellows having a separate rigid plastic dropper tube to which it is quickly and easily attached by merely pressing a portion thereof into the end of the tube, in combination with a bottle cap having interior threads thereon for threading onto a container for instance such as a plastic or glass bottle of well known type, the invention residing particularly in means providing a positive connection and sealing arrangement between the end of the dropper tube to which the bellows is connected, and the cap.

Further objects of the invention include the provision of a medicine dropper as above described wherein the dropper tube adjacent one end is provided with a self-sealing annular flange against which the top of the cap is adapted to impinge in order to provide a complete seal in this area, so that the cap will not leak; further in combination with an outstanding projection at the extreme end of the dropper tube, said projection having a slanted edge whereby the cap can be snapped down over the same onto said flange and said projection holds the cap against the flange in tight sealing relationship.

Among the advantages of this invention are the fact that the parts are very easy to mold and are quick and easy to assemble. The bellows has an extending portion which enters the dropper tube and tends to slightly enlarge the same to more positively grip the closure cap by expanding the tube in the area of the self-sealing flange and the projection above referred to, so that the device is inexpensive to manufacture and is completely sealed against any kind of leakage.

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 an exploded view illustrating the parts prior to assembly, and

FIG. 3 is an enlarged view partly in section illustrating the construction.

Referring to the drawings, there is shown a blow molded bellows member generally indicated by the reference numeral **10**. This bellows members is adapted to be easily collapsed by the fingers of the user so as to cause a vacuum action to suck up material into the dropper tube which is indicated generally at **12**. The bellows member

is made of thin-walled flexible plastic and integrally molded therewith there is a hollow cylindrical extension **14** having a narrow tip **16**.

The dropper tube **12** may be provided with a narrowed open end at **18** as usual and adjacent to but slightly spaced from the opposite end it has an annular self-sealing flange **20**. Spaced from the flange at the extreme end of the dropper tube is an annular projection **24** which is provided with a slanted edge **26**. That is, the edge of the projection extends at an angle with respect to the axis of the dropper tube gradually flaring out or diverging from the extreme end edge of the dropper tube to a position in spaced relation with respect to the annular flange **20**. The projection **24** need not necessarily be continuous but could be interrupted if this should be found to be convenient as will appear more clearly hereinafter.

The third part of the device is the closure cap generally indicated by the reference character **28**. This may if desired have a outstanding rim **30** and is has a barrel member **32** which is internally threaded for cooperation with the usual threads on well known types of containers having exterior threads at the necks thereof for application of the device to the container not only for storage of the dropper tube therein but also to close the container and prevent any kind of leakage. The closure is provided with a top **34** which has a central aperture therethrough of a size to just accommodate the diameter of the dropper tube and preferably the dropper tube is cylindrical and the hole in the top **34** of the closure **28** is circular.

It is to be understood that the parts are all conveniently molded of plastic. The cap **28** may be made of a more or less rigid material whereas the bellows is of course thin-walled and flexible. The dropper tube is also substantially rigid but it has a slight amount of give or resilience.

Referring now to FIG. 2, the cap **28** may be snapped down over the projection **24** coming to rest on the sealing flange **20** and in this position it is held in tight sealing relationship by the projection. The cap can snap past the projection **24** because of the slanted edge **26** and the distance between the flange **20** and the nearest surface of the projection **24** is substantially the same as the thickness of the top **34** of the closure cap so that the parts will be held in a good tight sealing relationship.

However the next step is to apply the bellows projection into the end of the dropper tube as is illustrated in FIG. 3. The exterior diameter of the projection **14** is very slightly greater than the interior diameter of the dropper tube and therefore it is seen that when the parts are forced together as in FIG. 3, the projection **14** exerts a radially outward pressure against the inner wall of the dropper tube, thus locking the top **34** of the cap in the groove which is formed between the projection **34** and sealing flange **20**, and thereby it is seen that a greatly improved leakproof seal in this area is clearly provided.

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 plastic dropper tube, an outwardly extending flange thereon adjacent an end thereof, an outwardly extending projection thereon at said end in spaced relation with respect to said flange, said projection being at the extreme end of said dropper tube,

a closure cap, said closure cap being of general cylindrical form and having internal threads thereon, and a top, said top having an aperture centrally thereof, said aperture in general having a diameter substantially the same as the external diameter of the dropper tube and having a thickness substantially the

same as the distance between said projection and said flange,

and a bellows, the bellows being of flexible thin and yieldable but resilient material, a projection on said bellows, said projection being hollow, said projection having an exterior diameter slightly greater than the interior diameter of the dropper tube, the top of said closure cap being located between the flange and said projection and being held to the dropper tube thereby, the projection of the bellows being located within the end of the dropper tube in the area of the top of the closure cap snugly holding the parts together in a leakproof sealing relationship with respect to a container to which the cap may be applied.

2. The medicine dropper construction recited in claim 1 wherein said projection at the end of the dropper tube is provided with a slanting edge surface diverging from the extreme end of said dropper tube toward the flange and the top member of said cap so that the latter may be

snapped over the same being held thereby against said flange.

3. The medicine dropper construction recited in claim 1 wherein said projection at the end of the dropper tube has a substantially conical surface which diverges from the extreme end of the dropper tube in a direction toward the flange and the top of said closure cap.

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