Nov. 5, 1968 E. J. STENGLE, JR 3,409,184

LIQUID DISPENSING DEVICE

Filed Dec. 15, 1966

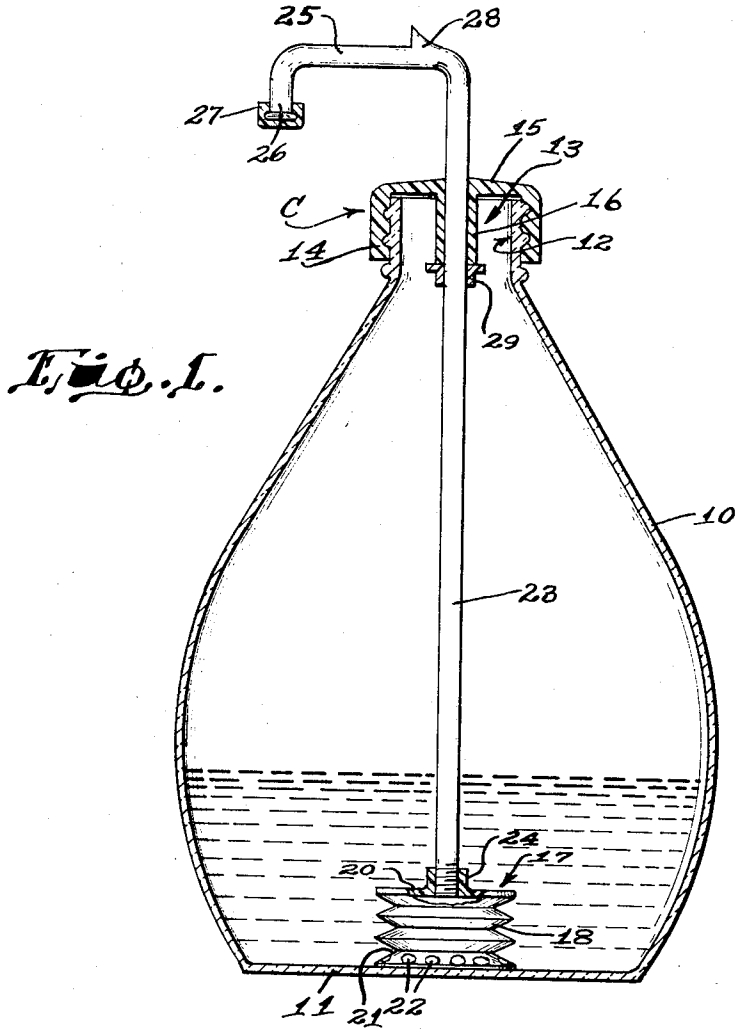
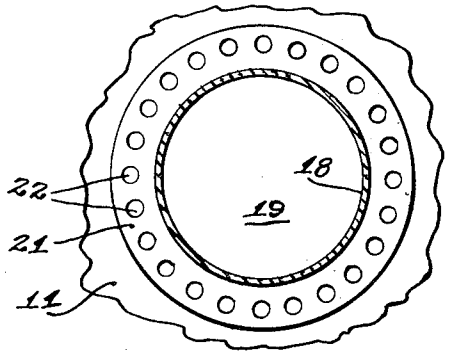


FIG. 1.

FIG. 2.



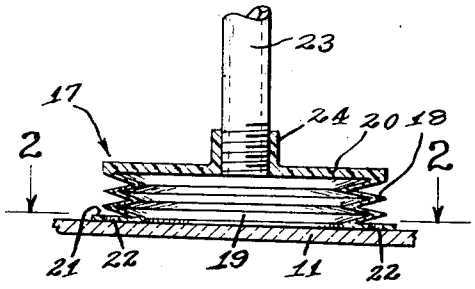


FIG. 3.

INVENTOR.
EDWARD J. STENGLE JR.

BY

J. R. Nelson and
W. A. Schaich
ATTORNEYS

United States Patent Office

3,409,184

Patented Nov. 5, 1968

3,409,184

LIQUID DISPENSING DEVICE

Edward J. Stengle, Jr., Toledo, Ohio, assignor to Owens-Illinois, Inc., a corporation of Ohio

Filed Dec. 15, 1966, Ser. No. 601,915
1 Claim. (Cl. 222—321)

ABSTRACT OF THE DISCLOSURE

A pump-type liquid dispenser positionable in a bottle and comprising a bellows-like cylindrical side-wall which is collapsible axially, such cylinder having one end open in the main and formed with a plurality of transverse ports adjacent said end, the opposed end being closed by a rigid wall carrying an axial dispensing tube opening through the latter into the cylinder, such tube intended to project through the bottle neck and manually actuated the collapse of the cylindrical side-wall only, against the bottom of the bottle, thus entrapping a measured amount of liquid in the cylinder for discharge through the tube when the cylinder is collapsed.

My invention relates to devices for dispensing liquid products, such as foods, chemicals, proprietary and household products which are packaged in glass, plastic or other containers.

An important object of my invention is the provision of a simple, effective, liquid dispenser, especially adapted for use with either narrow-neck or wide-mouth bottles, or such containers and capable of delivering or dispensing measured quantities of liquid with each operation of the dispenser.

Another object of my invention is the provision of a liquid dispensing device comprising a collapsible cylindrical bellows-like pump connected to a discharge tube and communicating with the interior of a bottle which houses such pump, to the end that liquid in an amount to fill the chamber is entrapped therein and then discharged through the tube in response to actuation of the pump.

It is also an object of my invention to provide a novel liquid dispenser embodying an axially collapsible cup-like chamber which functions both as a dispenser and means for predetermining the quantity of liquid dispensed with each operation of the device.

Other objects will be in part apparent and in part pointed out hereinafter.

In the accompanying drawings forming a part of my application:

FIG. 1 is a sectional elevational view showing my liquid dispenser assembled with a narrow-neck bottle.

FIG. 2 is a sectional plan view taken substantially along the plane of line 2—2 of FIG. 3.

FIG. 3 is an enlarged sectional view of the bellows-type pump shown in elevation in FIG. 1.

In the illustrated embodiment of my invention it is assembled with a bottle comprising a body **10**, bottom wall **11** and a diametrically reduced, externally screw-threaded neck **12** defining a mouth **13**. A closure cap C including a threaded attaching skirt **14** and panel **15**, or top portion, is telescoped over and threaded onto the neck **12**. This panel is formed with an internal axial guide sleeve **16** of about the same length as the attaching skirt to slidingly accommodate an element of my dispensing device as will become apparent hereinafter.

The dispensing device comprises a bellows-like cylinder pump **17** preferably formed of a plastic material such as polyethylene and including a cylindrical bellows

portion **18** having an open lower end **19** and a relative heavy rigid transverse wall **20** closing its upper end. The open lower end **19** is defined by a downwardly outwardly flared wall-section **21**, The outside diameter of which may be somewhat greater than that of the cylinder proper.

Additionally, this wall-section **21** is provided with a plurality of ports **22** or apertures, which, as is evident permit flow of liquid from the bottle into the pump **17**, from which it is discharged through a relatively rigid tube **23** incident to axial compression or collapse of the bellows portion **18**. The capacity of this bellows portion **18**, as is evident, predetermines the quantity of liquid dispensed with each operation. The end use will determine its size or capacity.

Compression or axial collapse of the bellows portion **18** is effected by means of the relatively rigid tube **23** which, as indicated above is also the liquid discharge tube. This tube may be either polyethylene or polypropylene. It is disposed coaxially with both the closure cap C and the pump **17**. This tube extends through the aforementioned guide sleeve **16** and has its lower end secured to the pump, as by threading it in a collar **24** on the rigid top wall **20**. The end of this tube above the closure cap C may be generally inverted U-shape providing a handle portion **25** affording easy manipulation of the pump. It also includes a spout **26** which is closable by a snap cap **27** or the like. In lieu of the conventional spout the opening of course may be such as to permit use of the device in spray application of the liquid dispensed. A thickened portion **28**, or button at the first bend of the tube permits actuation of the device merely by thumb pressure on this button. If preferred, the exposed section of the tube may well be initially a separate part which later is secured to the straight section. At the free inner end of the guide sleeve **16** is a ring gasket **29** or collar which encircles, and by a shrink fit, is securely affixed to the tube for the purpose of holding the latter against undesired displacement.

It will be apparent that with the parts positioned as shown in FIG. 1 liquid will flow readily into the pump by way of the apertures **22** or ports and fill the cylinder and the tube to the level of liquid in the bottle proper. Incident to downward axial pressure upon the tube **23** the bellows portion is compressed, resulting in flow of liquid from the pump to the spout **26**. Almost concurrently with initial downward movement of the tube **23** the wall-section **21** (FIG. 3) flattens out against the bottom wall **11** of the container, thus both closing the ports **22** and effectively sealing this section **21** against the container bottom to insure effective liquid discharge. As explained above, the spout **26** may be designed for either stream flow or spray application. Also, the pump will be selected according to the specific liquid involved, that is, the size and capacity and therefore the quantity of liquid dispensed with each operation will be determined by the particular kind of liquid being handled.

Modifications may be resorted to within the spirit and scope of the appended claim.

I claim:

1. In combination, a container embodying body and neck portions with the neck defining a mouth, there being a bottom wall below said neck portion, a closure cap affixed to the neck portion and having an axial opening therethrough, and a liquid dispensing device comprising a bellows-like axially collapsible cylinder formed of a resilient plastic material and having an open end normally resting upon said bottom wall coaxially with the opening in the closure cap, a relatively rigid wall closing the upper

end of the cylinder and a relatively rigid axially reciprocable tube communicating with the cylinder interior through an opening in said rigid wall, said tube being secured to said wall and extending outwardly through the opening in the closure cap, and means whereby liquid in the container may flow into the cylinder, the last named means being an apertured downwardly flared wall section defining the open end of the cylinder, said flared wall section being of greater outside diameter than the cylinder proper and adapted to lie flat against the container bottom wall when the cylinder is collapsed thereby to close the apertures.

References Cited

UNITED STATES PATENTS

2,283,414	5/1942	Cooper et al.	222—385 X
2,702,147	2/1955	Brown	222—321 X
3,124,275	3/1964	Lake	222—321 X

FOREIGN PATENTS

1,129,718	9/1956	France.

ROBERT B. REEVES, *Primary Examiner.*

N. L. STACK, *Assistant Examiner.*