

May 13, 1958

S. J. WOLF

2,834,497

NON-DRIP BOTTLE INSERT

Filed Aug. 7, 1953

FIG. 1.

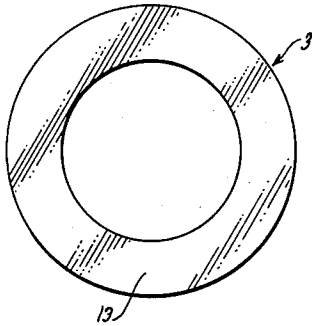


FIG. 3

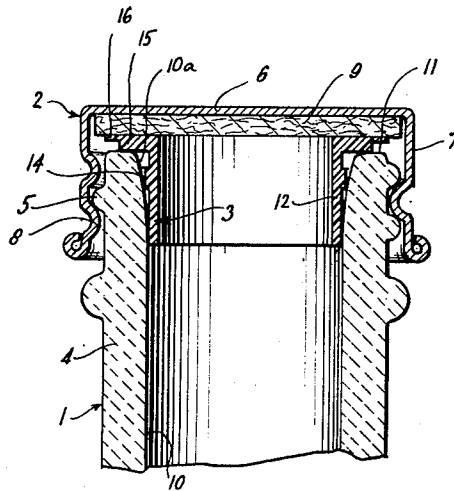


FIG. 2.

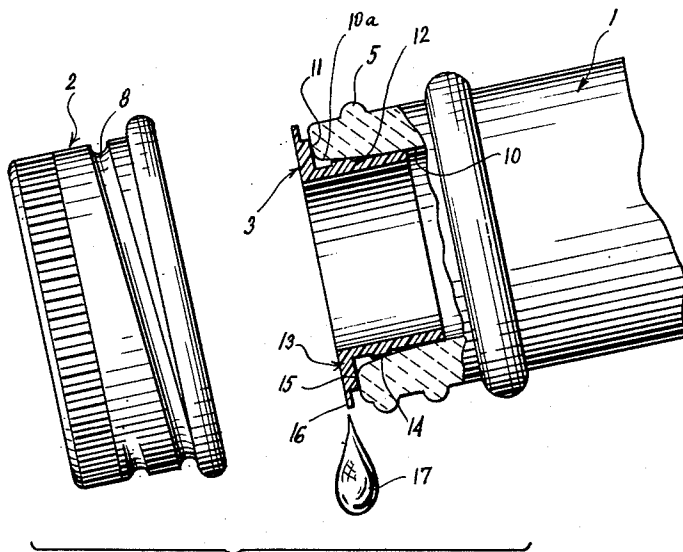
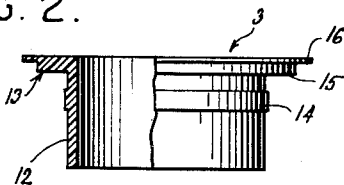


FIG. 4.

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2,834,497

## NON-DRIP BOTTLE INSERT

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Application August 7, 1953, Serial No. 372,899

4 Claims. (Cl. 215—40)

This invention relates to an improved non-drip pouring insert for the mouth of a liquid-containing bottle.

It is well known that when liquid is being poured out of a bottle, particularly a relatively full bottle, some of the liquid tends to run down the lip of the bottle down the outer peripheral face thereof. Also, when the bottle is returned to its erect position, at the conclusion of the pouring operation, liquid remaining in contact with the lip of the bottle tends to run down said outer peripheral face, instead of returning to the interior of the bottle. This second-mentioned difficulty especially occurs when the bottle is relatively empty.

According to this invention, I provide a flexible bottle-neck insert. This insert has a through-and-through longitudinal bore. Said insert has an inner longitudinal sleeve which can be frictionally inserted into the longitudinal neck of the bottle, to provide liquid-tight contact between said sleeve and the inner face of the neck of the bottle. At its outer end, said longitudinal sleeve is integral with a step-shaped transverse flange. This flange has an inner annular step or flange-portion and an outer annular step or flange-portion. The inner step or flange-portion has an inner transverse wall or face which makes liquid-tight contact with the transverse end-wall of the neck of the bottle. The diameter of the longitudinal cylindrical periphery of the annular inner step or flange-portion is smaller than the outer diameter of the end-wall of the neck of the bottle. The diameter of the longitudinal cylindrical periphery of the outer annular step or flange-portion is substantially equal to the outer diameter of the end-wall of the neck of the bottle. The thickness or axial dimension of the inner step or inner flange-portion is greater than the thickness or axial dimension of the outer step or flange-portion. As later stated herein, the thickness or axial dimension of the inner step or inner flange-portion may be very small, such as 0.04 inch, and the thickness or axial dimension of the outer flange-portion is less, such as 0.02 inch. I thus provide an extremely thin outer step or flange-portion, so that its cylindrical periphery can effectively prevent the poured liquid from contacting with the outer axial wall of the neck of the bottle.

The insert is preferably made of polyethylene or the like material, said material being chemically substantially inert to most liquids commonly packaged in bottles, somewhat resilient to ensure proper frictional force-fit of its neck within the bottle neck and adapted to be molded, and easily machined or otherwise processed to relatively precise dimensions.

It has been found in the use of this insert that it substantially prevents liquid from dripping down the outer peripheral face of the bottle, both during and after the pouring operation.

An object of this invention is to provide an insert of the above described type, whose neck or sleeve is shaped for frictional interfit within the necks of conventional glass liquid-containing bottles.

Other objects and advantages of this invention will become apparent from the following description, in accord-

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ance with the annexed drawings, in which a preferred embodiment is shown.

The drawings are substantially to scale of a working model of the invention.

In the drawings,

Fig. 1 is a top plan of the improved insert.

Fig. 2 is a side elevation, partly in axial section and partly broken away, of the insert.

Fig. 3 is a vertical section of an assembled bottle, insert and bottle closure, the representation of the lower portion of the bottle being omitted.

Fig. 4 is an exploded perspective view of the bottle closure and the bottle, the bottle having the improved insert assembled therewith. The insert is shown in vertical axial section.

Upon reference to the drawings in detail, it will be seen that they show a conventional glass bottle 1, a conventional closure cap 2 for bottle 1 and an insert 3.

Said bottle 1 has the usual substantially cylindrical and longitudinal neck 4. Said neck 4 has a top transverse end-wall or lip 11 and external screw threads 5. Cap 2 has an upper or outer transverse end-wall 6 and a cylindrical and longitudinal peripheral wall 7 with internal screw threads 8, whereby cap 2 may be screwed on the neck 4 of bottle 1 in the usual manner. The manner of closure of bottle 1 is not a part of the invention; and it will be apparent that cap 2 and bottle 1 may be assembled by any suitable means, or else cap 2 may be omitted. Optionally, cap 7 has a conventional liner 9 on the lower face of end wall 6.

Neck 4 has a bore 10 which is generally cylindrical, but which is optionally slightly outwardly flared at its upper end portion 10a. The exact shape of the neck bore 10 is not a part of the invention, and it will be apparent that the shape of insert 3 may be modified in accordance with a modified bottle neck shape.

Insert 3 is preferably made from one piece of polyethylene or the like, and is flexible and resilient. Said insert has a hollow, substantially cylindrical longitudinal sleeve or neck 12, which has a transverse outwardly extending, annular upper end flange 13. Optionally and preferably, the sleeve or neck 12 of insert 3 has an annular rib 14 on its outer peripheral face, said rib 14 being axially spaced from and of smaller diameter than flange 13.

The transverse flange 13 is step-shaped. It has an inner annular step or flange-portion 15, and an outer annular step or flange-portion 16. The outer flange-portion 16 provides the pouring surface, and it is therefore designated as the pouring flange-portion. The diameter of the cylindrical periphery of the outer flange-portion 16 is greater than the diameter of the cylindrical periphery of the inner flange-portion 15. The diameter of the cylindrical periphery of inner flange-portion 15 is less than the outer diameter of the end-wall 11 of the neck 4. Preferably, the diameter of the cylindrical periphery of outer-flange portion 16 is not greater than the outer diameter of the end-wall 11 of neck 4.

Preferably, also, flange pouring portion 16 is quite thin, and it may optionally be tapered at its peripheral edge so as to be of minimum thickness at its peripheral edge.

Reference may be made to the drawings to complete the disclosure as to the preferred dimensions of insert 3. As previously stated, the drawings are to scale of a working model of the invention. The preferred dimensions or proportions will be apparent from the fact that the diameter of flange portion 16 in the working model was approximately one inch. While the dimensions of insert 3 may be varied in accordance with variations in the diameter of bottle neck 4, it is preferred that the respective thickness of flange portion 15 and of flange portion 16 remain substantially as illustrated, when the contents of bottle 1 are

intended to be relatively free-flowing liquids, such as water, wine or the like.

In assembly, the sleeve or neck 12 is inserted into the bore 10 of neck 4 with the lower portion of sleeve 12 extending inwardly or below the convex flared bore portion 10a, and fitting frictionally within said bore 10, and with the inner or lower planar face of flange-portion 15 resting upon bottle lip 11. Insert rib 14 is located within bore portion 10a and fits frictionally therein. The inner flange-portion 15 holds the outer flange pouring portion 16 spaced outwardly or above lip 11 by a distance equal to the axial dimension or thickness of said inner flange-portion 15.

If desired, cap 2 may then be screwed onto bottle neck 4, with liner 9 abutting the planar upper face of pouring portion 16 of flange 13. Optionally, liner 9 can be omitted, with inner flange-portion 15 then serving as a seal between lip 11 and cap wall 6.

When it is desired to pour out the liquid contents of bottle 1, cap 2 is removed and the bottle is tilted in the usual manner. Fig. 4 shows bottle 1 in position after part of its contents have been poured out and after it has been turned toward its upright position just enough to stop the pouring. Fig. 4 also shows the usual drop of liquid 17 which collects upon the upper face of pouring portion 16 of flange 13 just as the pouring is terminated. As shown in Fig. 4, this drop 17 has just run off pouring portion 16 of flange 13 and away from the outer periphery of the bottle.

In conventional practice, in which insert 3 is omitted, any drop of liquid remaining upon the lip 11 at the cessation of the pouring, tends to run down the side of the bottle. When insert 3 is used, the drop or drops 17 remaining on pouring portion 16 at the cessation of the pouring, drop off the knife-like peripheral edge thereof, the space between said pouring portion 16 and lip 11 (i. e., the height or thickness of flange portion 15), as well as the difference in diameter between flange portions 16 and 15, being preferably sufficiently great in relation to the viscosity of the liquid in use, to prevent the drop 17 from bridging the space between flange portion 16 and lip 11 and thereby running down the bottle.

It will also be apparent, without further explanation, that the provision of the thin-edged pouring portion 16, together with the spacing from the end-wall 11 which is provided by flange-portion 15, substantially prevents liquid from running down the side of the bottle, even when the liquid is being poured from a relatively full bottle.

The provision of rib 14 is important, as it results in contact of insert neck 12 with bore 10 at two spaced-apart places on neck 12, rather than along the entire length of neck 12. As a result of the flexibility and resiliency of insert 3, a better fit is thus possible than if neck 12 conformed exactly in shape to that of bore 10.

Optionally, rib 14 may be omitted if bore 10 is not flared or is only slightly flared.

While flexible and resilient, polyethylene is the highly preferred material, other plastics and resilient and non-resilient materials may be used.

In the illustration above given, the annular pouring flange 16 is of uniform thickness, which is .020 inch, and the thickness of the annular flange-portion 15 is .040 inch, the outer diameter of shoulder 15 is  $1\frac{5}{16}$  inch.

It is highly desirable to provide a pouring lip or annulus 16, which extends laterally close to the edge of the planar lip or rim 11 at the top of the bottle. The outer periphery of the neck of the bottle is cylindrical or substantially cylindrical, directly below said lip or rim 11. The circular or cylindrical laterally outer edge of the pouring lip 16, either has the same diameter and cylindrical part of the periphery of the neck of the bottle, or said laterally outer edge of the pouring lip 16 is of slightly greater or less diameter than the outer diameter of said annular or substantially annular end-wall 11 of the neck

10 of the bottle. The adhesion of wine or water to polyethylene is low, so that when the pouring is stopped and the bottle is tilted toward its upright position, any wine or water which adheres to the annular surface of the pouring lip 16, will drop from said pouring lip, instead of spreading along the outer surface of the neck of the bottle. The entire insert 3, and particularly its pouring lip 16, is made smooth, in order to minimize adhesion of wine or water thereto.

Even if the outer lateral edge of the pouring lip 16 extends laterally beyond the outer lateral edge of the lip or rim 11 and beyond the cylindrical end-portion of the neck 10 which is adjacent said lip or rim 11, enough clearance is left so that the screw-cap 2 can be applied and removed in the usual manner.

The rib 14, whose use is optional, has a cylindrical outer periphery.

If the rib 14 is used, the insert 3 makes liquid-tight contact with the wall of the bore of the neck, both at the lower end-part of said insert 3, and also at the lip 14. If the rib 14 is omitted, the insert 3 may make liquid-tight contact with the wall of the bore of the neck, only at the lower end-part of insert 3.

The upper part 10a of the bore 10 of the neck 4 flares upwardly, so that the top part of upper part 10 is of greater diameter than its bottom part. This makes it possible to use an insert 3, whose neck is of normal greater diameter than the more narrow part of the tapered bore. Hence the neck of the insert 3 may be easily pushed into the neck of the bottle, and the resilient neck of insert 3 is slightly laterally compressed when insert 3 is seated in final position, so that insert 3 is reliably frictionally held in the neck of the bottle, although said insert 3 can be easily removed by applying moderate force.

The insert 3 is suitable for use in conjunction with the pouring of various free-flowing liquids and is not limited to use with the previously mentioned liquids water and wine.

I have disclosed a preferred embodiment of my invention and have indicated various changes, omissions and additions which may be made therein. It will be apparent that various other changes, omissions and additions may be made without departing from the scope and spirit of the invention.

I claim:

1. In combination with a container which has a neck and which contains a liquid which has the free flow of water and wine, said neck being made of material which is wetted by said liquid, a flexible hollow insert made of resilient, non-wettable material, said neck having a bore which has a longitudinal axis, said bore having an axial wall, said neck having an outer and substantially planar end-wall which is transverse relative to said axis, said insert having an inner hollow sleeve located in said bore and in liquid-tight contact with said inner axial wall, said inner sleeve being integral with a step-flange which is external to said end-wall, said step-flange being transverse relative to said axis, said step-flange consisting of an inner flange-portion of outer diameter less than the outer diameter of said end-wall and an outer flange-portion of substantially the same outer diameter as the outer diameter of said end-wall, said inner flange-portion having a transverse inner face which contacts liquid-tight with only a part of said end-wall of said neck adjacent said inner axial wall of said neck, said flange-portions being thus shaped to provide an annular air-space between said end-wall and said outer flange-portion, said outer flange-portion having an outer end-surface which is substantially planar and substantially perpendicular to said axis, the height of said outer flange-portion being less than the height of said inner flange-portion, the difference in height and the difference in outer diameter of said flange-portions being sufficiently great in relation to the viscosity of said liquid to prevent a drop of said liquid, in a pouring operation, from bridge of said annular air space.

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2. In combination with a container which has a neck and which contains a liquid which has the free flow of water and wine, said neck being made of material which is wetted by said liquid, a flexible hollow insert made of polyethylene, said neck having a bore which has a longitudinal axis, said bore having an inner axial wall, said neck having an outer and substantially planar end-wall which is transverse relative to said axis, said insert having an inner hollow sleeve located in said bore and in liquid-tight contact with said inner axial wall, said inner hollow sleeve being integral with a step-flange which is external to said end-wall, said step-flange being transverse relative to said axis, said step-flange consisting of an inner flange-portion and an outer flange-portion, the thickness of said inner flange-portion being substantially 0.04 inch, the thickness of said outer flange-portion being substantially 0.02 inch, the outer diameter of said outer flange-portion being substantially equal to the outer diameter of said end-wall of said neck, the outer diameter of said inner flange-portion being not more than substantially fifteen-sixteenths of the outer diameter of said outer flange-portion, said outer flange-portion having an outer end-face which is substantially planar and substantially perpendicular to said axis.

3. In combination with a container which has a neck and which contains a liquid which has the free flow of water and wine, said neck being made of material which is wetted by said liquid, a flexible hollow insert made of polyethylene, said neck having a bore which has a longitudinal axis, said bore having an axial wall, said neck having an outer and substantially planar end-wall which is transverse relative to said axis, said insert having an inner hollow sleeve located in said bore and in liquid-tight contact with said inner axial wall, said inner sleeve being integral with a step-flange which is external to said end-wall, said step-flange being transverse relative to said axis, said step-flange consisting of an inner flange-portion of outer diameter less than the outer diameter of said end-wall and an outer flange-portion of substantially the same outer diameter as the outer diameter of said end-wall, said inner flange-portion having a transverse inner face which contacts liquid-tight with only a part of said end-wall of said neck adjacent said inner axial wall of said neck, said flange-portions being thus shaped to provide an annular air-space between said end-wall and said outer flange-portion, said outer flange-portion having an outer end-

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surface which is substantially planar and substantially perpendicular to said axis, the height of said outer flange-portion being less than the height of said inner flange-portion.

4. In combination with a container which has a neck and which contains a liquid which has the free flow of water and wine, said neck being made of material which is wetted by said liquid, a flexible hollow insert made of polyethylene, said neck having a bore which has a longitudinal axis, said bore having an axial wall, said neck having an outer and substantially planar end-wall which is transverse relative to said axis, said insert having an inner hollow sleeve located in said bore and in liquid-tight contact with said inner axial wall, said inner sleeve being integral with a step-flange which is external to said end-wall, said step-flange being transverse relative to said axis, said step-flange consisting of an inner flange-portion of outer diameter less than the outer diameter of said end-wall and an outer flange-portion of substantially the same outer diameter as the outer diameter of said end-wall, said inner flange-portion having a transverse inner face which contacts liquid-tight with only a part of said end-wall of said neck adjacent said inner axial wall of said neck, said flange-portions being thus shaped to provide an annular air-space between said end-wall and said outer flange portion, said outer flange-portion being thin, having a sharply defined peripheral pouring edge, and having an outer end-surface which is substantially planar and substantially perpendicular to said axis, the height of said air-space being of sufficient magnitude to prevent said liquid from running onto said neck of said container upon the cessation of the pouring from said container of a portion of said liquid.

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