

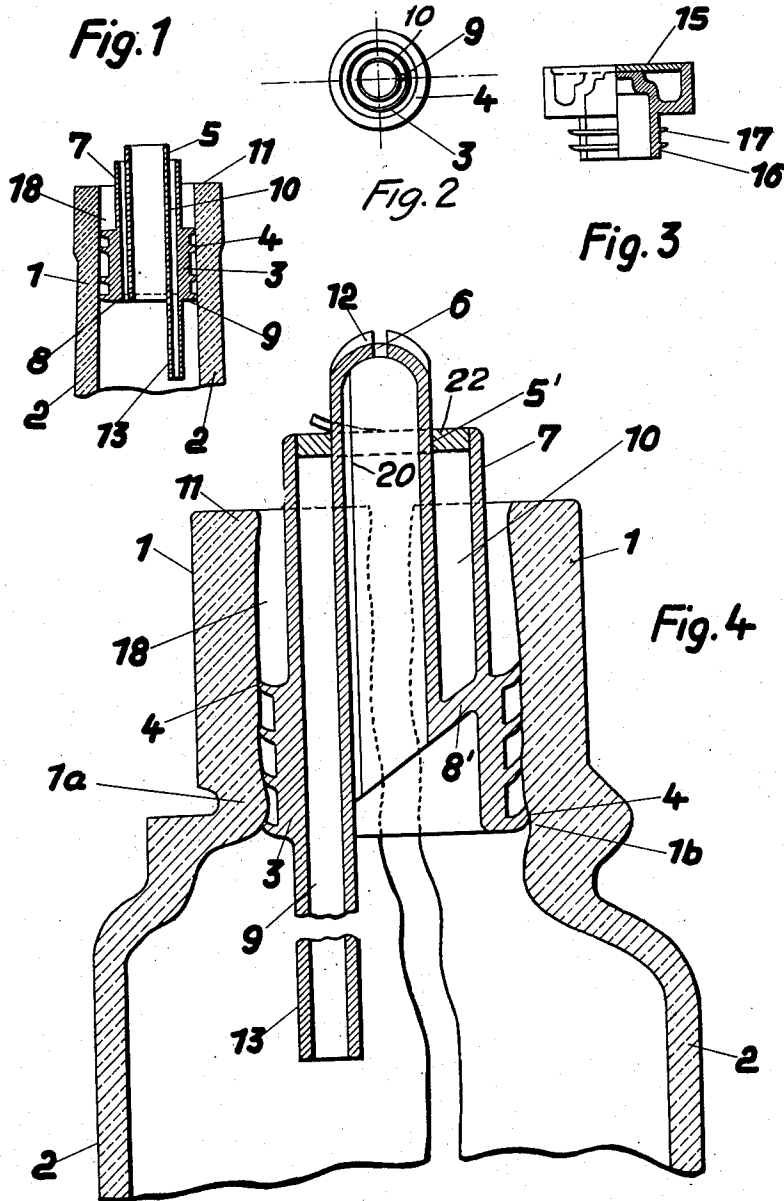
July 23, 1957

H. BRÜNE ET AL
CLOSURES FOR THE OUTLET OPENING OF
BOTTLES, CONTAINERS, PIPES
AND THE LIKE

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3 Sheets-Sheet 1



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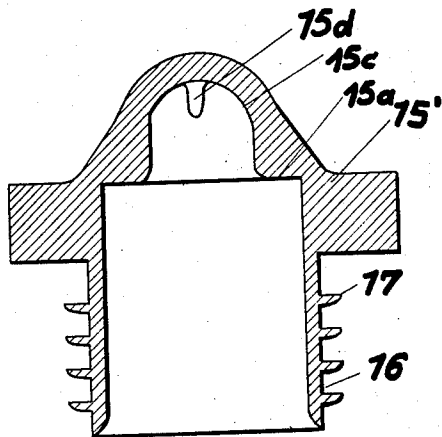


Fig. 5

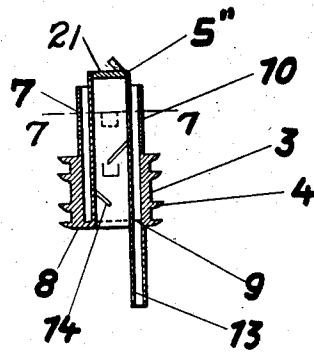


Fig. 6

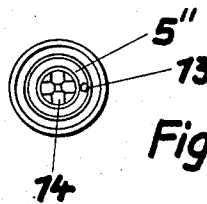


Fig. 7

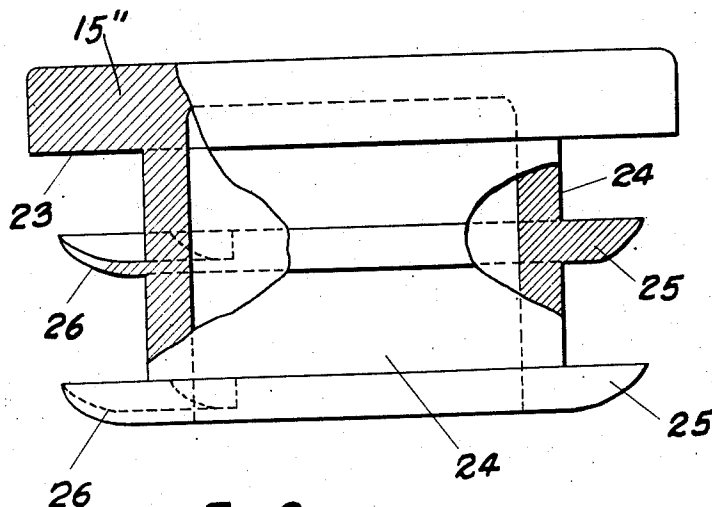


Fig. 8

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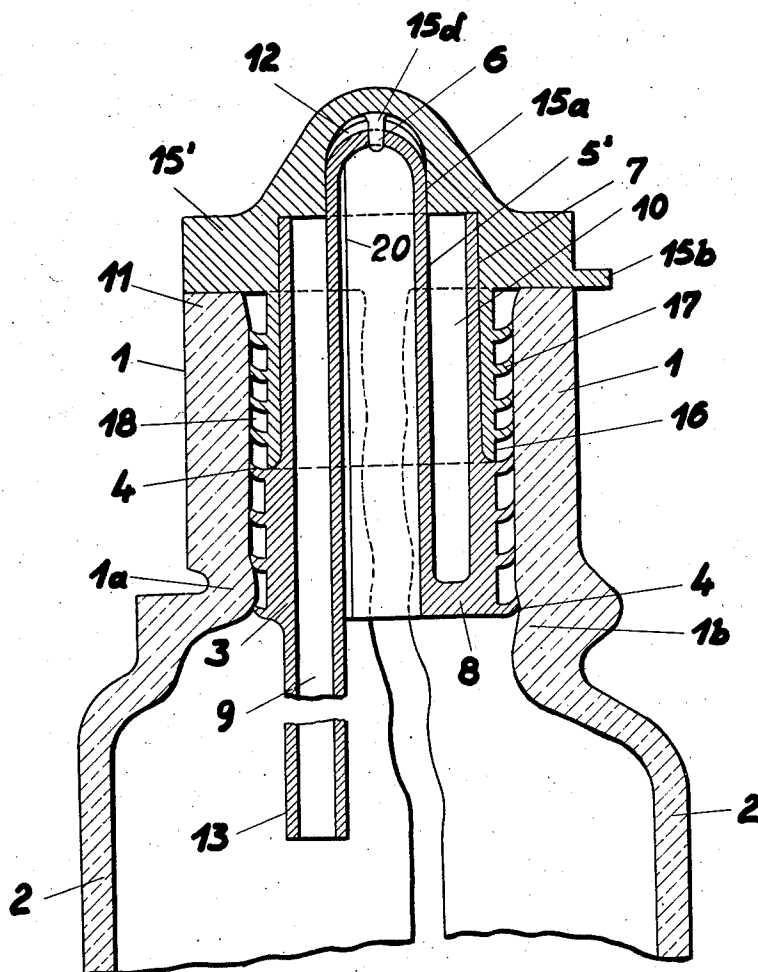
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Fig. 9



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CLOSURES FOR THE OUTLET OPENING OF BOTTLES, CONTAINERS, PIPES AND THE LIKE

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9 Claims. (Cl. 215-79)

The present invention relates to means for closing the open outlet ends of bottles, containers, pipes, and the like and is more particularly concerned with a closure for being inserted in the outlet of such apparatus for at times closing the same and at other times permitting the steady flow or dripping of liquid through said outlet.

The principal object of the invention is to provide a bore closure which can be quickly and easily detachably mounted within said bore and can be used for completely closing the bore or readily permitting a flow of liquid or dripping of liquid therethrough.

Further objects of the invention will be in part obvious and in part pointed out in the following description of the accompanying drawings, wherein:

Fig. 1 is a longitudinal section of one form of closure positioned within the outlet of a bottle.

Fig. 2 is a top plan view of Fig. 1.

Fig. 3 is a side elevation partly in section of a cap for the outlet closure.

Fig. 4 is an enlarged longitudinal section of a modified form of closure positioned in the outlet of a bottle having an irregularly surfaced bore.

Fig. 5 is an enlarged cross sectional view of a cap for the closure of Fig. 4.

Fig. 6 is a longitudinal section of a still further modified form of outlet closure.

Fig. 7 is a cross sectional view taken on line 7-7 of Fig. 6.

Fig. 8 is a side elevation with portions broken away to show details of a modified form of cap for the closures; and,

Fig. 9 is an enlarged longitudinal cross section of a modified form of closure with the cap in position on the closure.

Referring now more in detail to the accompanying drawings, wherein like and corresponding parts are designated by similar reference characters, numeral 1 refers to the outlet of a bottle 2. Numeral 3 indicates a cylindrical body having resilient annular laterally extending ribs 4 formed around its periphery and a bottom 8. A light outlet tube 5 extends coaxially through the center of the bottom 8 of the body 3. An outer tube 7 formed by a prolongation of minor diameter of the body 3 extends from the top of said body contiguously and coaxially with tube 5. The bottom 8 of body 3 is substantially flat and extends perpendicular to the axis of said body 3. An opening 9 is formed in said bottom 8 and communicates with the annular space 10 provided between tube 5 and prolongation 7 as well as body 3. As shown in Fig. 1, the tops of tube 5 and prolongation 7 are shown as extending above the lips 11 of outlet 1 but may equally as well be positioned below said lip. A tube 13 extends below said bottom 8 longitudinally of body 3 with its bore being in communication with said opening 9 and thereby with space 10.

A cap for said closure of Fig. 1 is shown in Fig. 3 and consists of a top 15 having an inwardly extending shoulder 15a and an exterior tongue 15b for the purpose

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of lifting said cap. A tubular member 16 of reduced diameter extends from top 15 and has a plurality of annular laterally extending ribs 17 formed on the periphery thereof. The bore of the tubular member 16 is sized to fit over prolongation 7 with shoulder 15a closing space 10 and the top of cap 15 closing tube 5. Ribs 17 are also formed for extending to the interior of the bore of outlet 1 for extending thereacross.

In Fig. 4 there is shown a modified form of closure similar to that of Fig. 1, except that the bottom 8' extends on an angle relative to the axis of the body 3 and liquid outlet tube 5' is closed at its upper end except for a restricted opening 6. The exterior of this upper end of tube 5' has a plurality of capillary grooves formed by flanges 12. Longitudinally extending capillary grooves formed by flanges 20 are formed in the interior of said prolongation 5'. These capillary formations force the single liquid drops which are hanging on the interior of the outlet pipes by capillary action into the interior of the tube 5. It is to be noted that tube 7 is spaced from the interior of the wall 1 providing an annular space 18 therebetween.

The bottle of Fig. 4 has an outlet 1 with an irregular interior surface having a bulged portion 1a and a recessed portion 1b, but the ribs 4 fit against this irregular surface for completely closing off the same.

In Fig. 5 there is shown a cap 15' for the closure of Fig. 4 which also has a shoulder 15a for closing space 10, a tongue 15b for lifting the cap, a tubular extension 16 having annular ribs 17. In addition, cap 15' has a recess 15c provided in the interior top surface thereof which will fit over the exterior end of tube 5. The stopper 15d extends within this recess 15c for being inserted in opening 6 of said tube 5 or 5' for closing the same. Thus the cap 15' will extend over the tube 5' and the prolongation 7. The ribs 17 closing the space 18 and the cap being positioned upon lip 11 of said bottle 1.

Figs. 6 and 7 show a further form of closure similar to that of Fig. 1, except that liquid outlet tube 5'' has a plurality of flanges 14 extending within the bore thereof, but positioned in a staggered relationship to one another for resisting the flow of liquid through tube 5'' and thus slowing its passage therethrough.

Fig. 8 shows a further form of cap 15'' for the closures which has a substantially flat top 23 with tube 24 extending downwardly therefrom from which extend the flanges 25. In this modification the flanges 25 have a section 26 from which the material has been removed leaving a thinner and therefore less resisting portion. This section 26 can extend for 45 to 60° of the area of each of said flanges. Thus when the cap is placed within the space 18 the flanges 25 seal off the bore and, while pushing the cap downwardly, compresses the air within the container. The weakened section 26 permits the escape of this compressed air until the pressure is reduced whereupon the section 26 resumes its normal shape and continues to seal off the outlet of the container.

Body 3 of Fig. 1 can be inserted in the outlet of the open end of a bottle, container, pipe or the like and the ribs 4 being somewhat resilient will extend completely across the outlet closing the same off. By tilting the bottle, for example, fluid will pour through tube 5 while air will enter through tube 7 into space 10 and through opening 9 and tube 13 into the interior of bottle 2 for replacing the liquid being removed and thus assuring a continuous and steady flow of the fluid. Upon returning the container to an upright position, liquid around the mouth of tube 5 will pass into space 10 and return to the bottle 2 through tube 13.

When it is desired to completely close the bottle, cap 15 is placed over the end of tube 7 closing the top there-

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of while the tube 16 is inserted within the space 18 and the ribs 17 provide an additional sealing thereof.

The device in Fig. 4 has a restricted opening 6 at the end of the liquid outlet tube 5 which permits only drops of liquid to flow from tube 5, while the ribs 4 being somewhat resilient adapt themselves to the irregular bore of outlet 1 by bending slightly upwardly and effect a complete sealing of the same.

The closure of Fig. 6, in addition to the flanges 14 for restricting the flow of liquid, has a plug 21 positioned in the upper end thereof which must be removed before liquid can be poured. The closure of Fig. 4 has an annular shaped plug 22 for inserting in the open end of tube 7 for closing the same and thus preventing the use of this closure until said plug is removed. Plugs 21 and 22 can be replaced or destroyed, but when placed initially in position with a sealing material will indicate if the closure has been used upon the breaking of the sealing material to remove the plug and thus assures purchasers of containers having these closures therein that the contents have not been even partially removed.

The body 3 with its associated elements, tubes 5 and 7 and 13, their flanges 4 can be made from one piece of material. Similarly, caps 15, 15' and 15'' can also be made of one piece of material. This material is preferably a plastic which will not affect the taste of the liquid flowing therethrough and also which, while being resilient, is also sufficiently rigid to maintain its shape. Such a plastic as is suitable for this purpose is polyethylene. However the closure can also be made from natural and artificial rubber products as well as Celluloid and other materials conventionally used for the closures of this nature.

The container 2 as shown in the drawings refers to any conventional container such as bottles and the like regardless of the material from which they are produced.

The present device is capable of considerable modification and such changes thereto as come within the scope of the appended claims are deemed to be a part of the present invention.

What we claim is:

1. A dropping and pouring insert of one piece of material for tubular outlets of containers comprising a cylindrical body, a plurality of resilient annular ribs extending laterally from the periphery of said body whereby upon the wedging of said insert between the interior wall of said container outlet said ribs seal off said outlet and space said body from said outlet wall, a cylindrical prolongation of said cylindrical body of a reduced diameter, a liquid outlet tube extending coaxially with and through the central portion of said cylinder and of said prolongation and spaced from the inner side walls thereof, said liquid outlet tube opening through the bottom of said body, a second tube extending exteriorly of said body through the bottom thereof with a bore opening into the space between said outlet tube and the interior of said cylinder.

2. A dropping and pouring insert for tubular outlets of containers as claimed in claim 1, wherein said liquid outlet tube extends centrally of and beyond the open end of said cylindrical prolongation,

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3. A dropping and pouring insert for tubular outlets of containers as claimed in claim 1, wherein said liquid outlet tube is of a cylindrical configuration with the head thereof extending beyond the open end of said cylindrical prolongation and said outlet tube has a conically constricted outlet opening provided in the exteriorly positioned end thereof.

4. A dropping and pouring insert for tubular outlets of containers as claimed in claim 1, wherein said liquid outlet tube has capillary grooves formed by flanges provided on the interior surface and the exterior end surface thereof.

5. A dropping and pouring insert for tubular outlets of containers as claimed in claim 1, wherein said cylinder bottom extends on a slant transversely to the longitudinal axis of said cylinder.

6. A dropping and pouring insert for tubular outlets of containers as claimed in claim 1, comprising in combination therewith a cap having a recess for receiving and closing the upper ends of said cylindrical prolongation and of said liquid outlet tube, said cap also having a lower portion being capable of insertion within said outlet closely surrounding said cylindrical prolongation and a plurality of resilient annular ribs extending laterally from the periphery of said cap lower portion and capable of sealing the space between said cap and the interior wall of said outlet.

7. A dropping and pouring insert for tubular outlets of containers as claimed in claim 1, wherein said liquid outlet tube has a restricted outlet opening, a cap having a recess has the outlet end of the said cylindrical prolongation and the restricted end of said outlet tube detachably and closely inserted therein and a tongue extends from said cap into said cap recess for insertion in and closing of said liquid outlet tube restricted opening.

8. A dropping and pouring insert for tubular outlets of containers as claimed in claim 1, wherein the said liquid outlet tube has a plurality of staggered projections extending into the bore thereof restricting the flow of fluids therethrough.

9. A dropping and pouring insert for tubular outlets of containers as claimed in claim 1, wherein a plurality of flaps are mounted along the bore of said liquid outlet tube and positioned in staggered relationship relative to one another for closing said outlet tube against the return flow of fluid.

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