

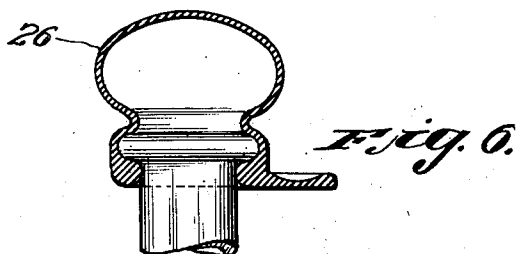
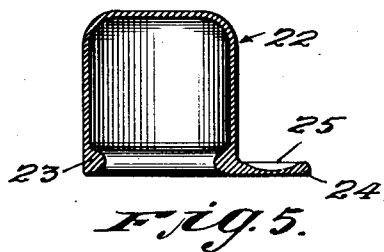
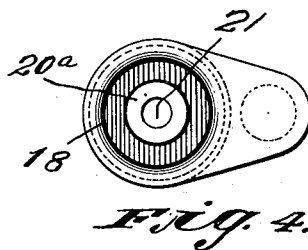
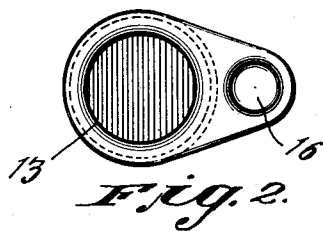
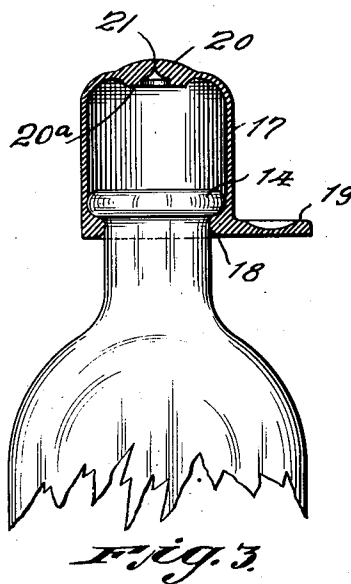
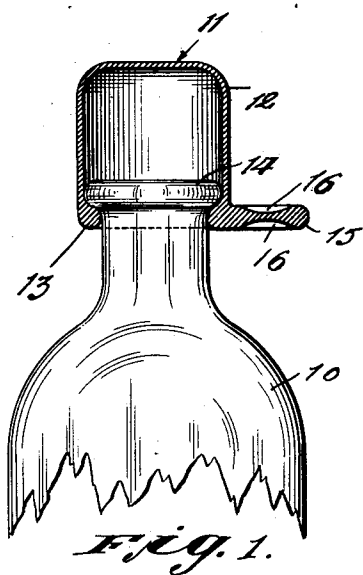
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E. SIMMONS

BOTTLE CLOSURE

Filed April 27, 1925



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UNITED STATES PATENT OFFICE.

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BOTTLE CLOSURE.

Application filed April 27, 1925. Serial No. 25,996.

To all whom it may concern:

Be it known that I, ELTA SIMMONS, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Bottle Closures, of which the following is a specification.

This invention relates to closures for bottles and similar receptacles, and has for its principal object to provide a sealing cap which may be conveniently put upon the bottle, and which will seal the bottle completely, to keep its contents pure, and the upper rim clean and uncontaminated.

It is a further important object to so construct the cap that it may be applied to the bottle without inserting the fingers inside the cap and without touching the upper rim of the bottle. To this end provision may be made of a relatively stiff, neck-gripping bead, preferably located interiorly of the cap at the lower periphery thereof, and of a tab projecting from the bead in the plane thereof which is stiff enough and is connected over an arc of sufficient extent to distribute the pull throughout the whole bead and thereby avoid narrowing of the cap opening when the tab is pulled to draw the cap onto the bottle. The tab may be provided with one or more gripping depressions.

It is a further object of the invention in one of its embodiments to provide a sealing cap of the kind referred to, having a valve therein constructed to permit egress but not ingress of vapors and gases, so that the contents of a bottle or other container may be sterilized by boiling, with the cap in place, and cannot thereafter be contaminated by exposure to the air.

In the drawings:

Figure 1 is a fragmentary view of a bottle having a cap embodying this invention applied thereto, the cap being shown in section;

Figure 2 is a bottom plan view of the cap shown in Figure 1;

Figure 3 is a view similar to Figure 1, showing the form of cap having a valve;

Figure 4 is a bottom plan view of the cap shown in Figure 3; and

Figure 5 is a sectional elevation of another form of sealing cap made in accordance with this invention.

Figure 6 is a sectional elevation of a cap similar to that of Figure 5, except that the body is balloon shaped.

The invention is shown in Figure 1 as applied to a baby's nursing bottle 10. It is customary in hospitals to prepare and bottle all the formulæ and feedings for twenty-four hours at one time. The bottles and all the utensils used in preparing the formulæ are sterilized and the bottles are then filled with the formulæ and hermetically sealed to keep the contents pure. It has been customary heretofore to seal the bottle by stuffing a stopper of cotton or cork in its mouth. This has been effective to keep the contents pure but has left exposed to contamination the upper rim of the bottle with which the contents come in contact when a nipple is substituted.

The cap of the present invention protects this upper rim as well as the contents of the bottle. It is important, however, in this connection that the cap be applied without soiling the rim of the bottle or interior of the cap. The cap of this invention is therefore constructed to enable it to be drawn onto the bottle without touching the bottle rim or the interior of the cap with the fingers.

The sealing cap 11 is made of elastic material, such as rubber. This cap 11 comprises a dome-shaped body portion 12 of thin rubber, provided at its lower periphery with a relatively thick, strong bead 13. This bead is capable of conforming to the bottle neck and of gripping it with sufficient force to form a hermetic seal. In order to avoid the necessity of inserting the fingers in the cap when drawing the bead 13 over the top flange or bead 14 of the bottle 10 a tab 15 is provided. It is a point that this tab 15 is thick enough to be fairly stiff and that it is connected to the bead 13 throughout substantially a semi-circumference thereof. The thickness of the tab 15 and the length of the arc over which it is connected to the bead 13 cause the pull exerted upon the tab in drawing the cap onto a bottle to be transmitted to all portions of a semi-circumference thereof. The thickness of the tab 15 and the length of the arc over which it is connected to the bead 13 cause the pull exerted upon the tab in drawing the cap onto a bottle to be transmitted to all portions of a semi-circumference of the bead substantially uniformly, so that the bead is not elongated by the pull. Such elongation of the bead would be objectionable, because the bead would be straightened to extend along

chords of the bottle neck, narrowing the cap opening so that the cap could not be conveniently forced down over the flange 14.

The tab is provided with depressions 16 in its upper and lower surfaces, to afford a firm and convenient finger grip.

The making of the tab 15 as a prolongation of the bead 13 in the plane thereof is important. The pull upon the bead is all exerted directly in the plane thereof, so that there is no tendency to cause distortion of the bead transversely of its plane, which would result in narrowing of the cap opening. The laterally projecting bead can be conveniently molded, the same molds having cavities of uniform thickness serving both for the bead and the tab.

The bead and tab construction described may be advantageously used on a nursing nipple to facilitate application of the nipple to the bottle and to avoid soiling the interior of the nipple and the bottom rim.

In the form of the invention shown in Figures 3 and 4 a cap 17, having a lower bead 18 and a laterally projecting tab 19 is provided with a valve for permitting egress, but not ingress, of vapors or gases. The upper body portion 20 of the cap 17 is made convex, and is much thicker than the remainder of the body portion. This convex portion 20 has a slot 21 at its center. An internal annular flange 20^a is formed around the lower margin of the thickened portion 20. With this form of cap the contents of a bottle or other receptacle may be sterilized by boiling in the bottle. The vapors generated and the air expanded in the bottle by such sterilization will escape through the slot 21 when the inside pressure exceeds the outside pressure so that there is no tendency to blow the cap off the bottle. The slot 21 is normally closed, however, by the pressure of the thickened convex portion 20 of the cap.

When the contents of a bottle have been sterilized and the bottle cools, the vapor within the bottle contracts and condenses forming a partial vacuum. The valve formed by the thickened and slotted portion 20 does not permit air to enter the bottle, however, to compensate for this reduced pressure. Instead, the outside air pressure causes the cap to collapse, and even to be sucked down into the neck of the bottle. In this position of the cap the thickening of the portion 20 and the provision of the internal reinforcing flange 20^a is especially important, because these parts maintain the convexity of the thickened portion, so that the external air pressure, instead of forcing a way through as it could if the valve portion became concave, simply forces the sides of the slot 21 more firmly together further assuring a perfect seal. When the bottle cap is thus forced into the neck of the bottle

the thin side walls of the cap 17 are wrapped around the flange 14 and are pressed firmly against the flange 14, because of the difference in the external and internal pressures. This further assures a perfect seal between the cap and the neck of the bottle, so that the bottle with its contents can be stored for a long time with assurance that the seal will remain unimpaired.

The cap 22 shown in Figure 5 is similar to the cap shown in Figures 1 and 2 with the exception that the bottoms of the bead 23 and the tab 24 are flat, being located entirely in one plane. Only one finger grip depression 25 is provided in this form. This construction makes for economy in manufacture because the caps can be molded to final form without the formation of fins on the interior of the bead which would require individual hand trimming.

In Figure 6 there is shown a cap 26 having a balloon shaped body. This cap is otherwise like the cap of Figure 5. The balloon shaped body may be stretched to a considerable extent and therefore may be fitted on bottle necks of a wide variety of sizes. In this respect, however, it differs only in degree from the other caps shown, as they too are capable of being stretched to a considerable extent if required.

While the invention has been illustrated and described with reference to babies' nursing bottles, it is obviously applicable to a variety of other uses in connection with other bottles, or other similar containers, such as jars or cans. The term "bottle" as used in the appended claims is, therefore, intended to include these equivalent containers. The term "cap" is also to be construed broadly as covering nipples and like closures in which the invention may be embodied.

Variations may be resorted to within the scope of the invention and parts of the improvement may be used without others.

What I claim is:

1. A sealing cap for bottles comprising a body portion of thin elastic material, an internal reinforcing and gripping bead extending around the open periphery of the cap, and a relatively stiff tab forming a prolongation of the bead in the plane thereof, whereby the cap may be pulled onto a bottle without inserting the fingers in the cap, such tab being connected to the bead over substantially a semi-circumference to distribute the pull upon the bead whereby narrowing of the cap opening at the bead is avoided.

2. A cap for bottles, of elastic material, comprising a portion for gripping the neck of a bottle and sealing the opening thereof and a tab extending laterally from the cap in the plane of its lower extremity whereby the cap may be pulled onto a bottle, said tab connected to the cap substantially through-

out a semi-circumference thereof and being stiff enough to transmit the pull uniformly without substantially narrowing the opening at the lower extremity of the cap.

5 3. A cap for bottles, of elastic material, comprising a portion for gripping the neck of a bottle and sealing the opening thereof, and a tab extending laterally from the cap substantially in the plane of its lower ex-
10 tremity whereby the cap may be pulled onto

a bottle; said tab connected to the cap throughout not less than substantially a semi-circumference thereof and being stiff enough to transmit the pull without substantially narrowing the opening at the 15 lower extremity of the cap.

In testimony whereof I have affixed my signature to this specification.

ELTA SIMMONS.