The present invention relates particularly to container closures of the cap type adapted to be used on bottles or other containers for medicines or other liquids which are required to be withdrawn from the bottle in small quantities and spread over a surface to be treated. The container or cap is provided with a centrally located applicator adapted to dip into the liquid in the container.

The object of the invention is to provide a combined closure and applicator wherein the applicator is of improved and simplified construction and is well adapted to resist corrosion, and wherein the applicator is held in place in the closure by reliable and efficient but nevertheless simple and inexpensive means.

In the accompanying drawing I have shown several embodiments of the invention, but it will be understood that the drawing is intended for illustrative purposes only and is not to be construed as defining or limiting the scope of the invention, the claim forming a part of this specification being relied upon for that purpose.

Of the drawing:

Fig. 1 is a side view of a combined container closure and applicator embodying the invention.

Fig. 2 is a central vertical sectional view of the combined closure and applicator shown in Fig. 1.

Fig. 3 is a central vertical sectional view similar to Fig. 2, but showing an alternate embodiment of the invention.

Fig. 4 is a fragmentary view showing the lower end of an applicator of a different type.

Figs. 5 and 6 are views similar to Fig. 4, but showing applicators differing in details from that shown in Fig. 4.

Refferring particularly to Figs. 1 and 2 of the drawing, 1 represents as an entirely a container closure in the form of a bottle cap. The external contour or configuration of the bottle cap 1 is immaterial insofar as the present invention is concerned, and I have therefore shown a bottle cap of conventional design. It will be understood, however, that the bottle cap may be formed with any usual or desired external design or contour.

The closure 1 is preferably molded from a material of the artificial resin type and is provided with a skirt 2 having suitable means adapted to mechanically interengage with corresponding means on the bottle or other container so as to mechanically hold the cap in place. Preferably and as shown, these mechanical retaining means are internal threads 3 which are adapted to engage corresponding external threads on the bottle or other container.

Centrally disposed within the cap and projecting downward from the top wall thereof is an integral cylindrical rod or prong 4, which serves as a means for the attachment of an applicator. The applicator as shown consists in part of a tube 5 which is of such size at its upper end as to be adapted to be forced over and to frictionally engage the attachment prong 4. The tube 5 is preferably formed of a metal such as pure tin which is adapted to resist the corrosive effect of most of the liquids with which an applicator of this class may be used. As shown in Figs. 1 and 2 the tube 5 is inwardly tapered near its lower end and a brush 6 of usual construction is held in place in the said tapered portion of the tube.

Within the cap 1 there is preferably provided a liner 7 which rests against the bottom surface of the top wall of the cap and which is provided with a central hole into which the tube 5 extends with a close fit. When the cap is in place on a bottle or other container, the liner 7 is forced against the top surface of the bottle and serves as a gasket to prevent the escape of liquid contents.

The upper end of the applicator tube 5 is provided with an outward turned horizontal flange 8 which is preferably seated within an annular groove or recess formed in the bottom of the top wall of the cap and surrounding the attachment prong 4. It will be observed from Fig. 2 that the flange 8 lies above the liner 7, with the result that the liner 7 by reason of its engagement with the bottom of the flange 8 assists in holding the applicator tube 5 in place. It will be observed that the tube 5 is held against downward movement in part by reason of its frictional engagement with the prong 4 and in part by the positive engagement of the flange 8 with the liner 7.

In Fig. 3 I have shown a construction similar to that shown in Fig. 2, but having incorporated therein special means for holding the liner in place, this means being similar to that disclosed in the patent of William P. Schmaulz for Container closure or bottle cap, No. 1,844,442, issued Feb. 9, 1932. The closure 9 shown in Fig. 3 is provided with a cylindrical surface 10, which defines or forms a distinct recess for the reception of the liner. The diameter of the recess is preferably at least as small as the minimum diameter between the tops of the threads 3. At the periphery of the recess are liner engaging ribs or projections 11, 11 which project inward and are adapted...
to engage the edge portions of the liner 7 to firmly hold it in place.

Preferably the projections 11, 11 comprise one or more threads having the same lead as the container engaging threads 3. The threads 11, 11 should be multiple, and I have shown threads having four starts. With multiple threads the liner is held at a plurality of circumferentially separated places. The bottle engaging threads 3 as shown are single, and in this case the multiple threads 11, 11 therefore have a smaller pitch than the said threads 3.

Inasmuch as the threads 11, 11 have the same lead as the threads 3 it is possible for the cap to be molded or cast around a threaded core pin. Because of the uniformity of lead the finished cap can be readily unscrewed from the core pin without any tendency to distort or strip any of the threads.

The projections 11, 11 whether constructed in the form of threads or otherwise, extend circumferentially throughout the entire periphery of the liner recess. When there are multiple threads they overlap each other, with the result that at every position around the periphery of the liner there is at least one thread, and in most places two threads, which are pressed into the yieldable material at the periphery or edge of the liner 7 to form an effective seal. This seal prevents any liquid from finding its way around the edge of the liner and into any space between the liner and the top of the closure body.

In Fig. 4 I have shown an applicator 12 which differs from the applicator 5 in that the brush is omitted and in that the lower end of the tube is provided with a closed rounded end. It will be understood that the liquids to be applied will adhere to the surface of the applicator 12 and may be applied by means of the rounded end portion thereof.

In Fig. 5 I have shown an applicator 13 similar to the applicator 12, but having very small annular grooves 13 which serve to assist in retaining the liquid to be applied. It will be apparent that the applicator 13 will retain a larger quantity of liquid than will the smooth surfaced applicator 12 shown in Fig. 4.

Fig. 6 shows an applicator 14 which differs from the applicator 13 in that the grooves 15 therein are vertical instead of horizontal.

What I claim is:

A combined container closure and applicator comprising in combination, a closure of the cap type having a central integral attachment prong wherein, a metallic applicator tube tightly fitting the attachment prong and having a flange at its upper end immediately adjacent the bottom of the top wall of the cap, the said tube being adapted at its lower end for retaining and applying a liquid, and a liner in the cap surrounding the tube and engaging the said flange at the bottom thereof to assist in holding the tube in place.

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