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C. C. WEBB

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BOTTLE CAP OR THE LIKE

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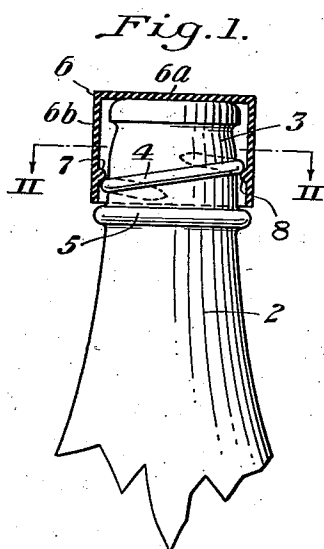


Fig. 2.

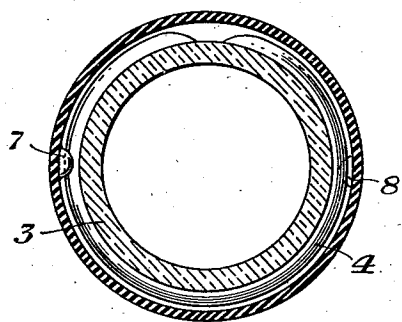


Fig. 3.

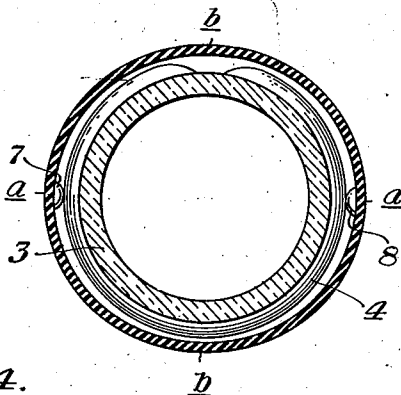
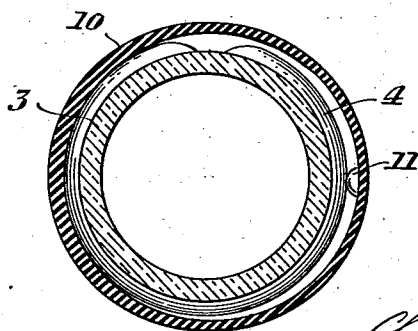


Fig. 4.



INVENTOR

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UNITED STATES PATENT OFFICE

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BOTTLE CAP OR THE LIKE

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2 Claims. (Cl. 215—43)

This invention relates to a cap for use on bottles and like containers and is particularly applicable to a cap made from a plastic substance, such as "Bakelite" or other synthetic resin.

5 Many types of containers, particularly bottles, are provided with a seal which forms the primary closure for the receptacle during the period of storage and transit until the receptacle reaches the ultimate consumer and is opened by him.
10 Over this primary seal, there is a cap often referred to as a "dust cap," which is intended for use on the receptacle after the primary seal has been removed. A typical example of such a container is a catsup bottle wherein a cup-like cap is
15 provided for closing the end of the bottle after the permanent seal has been once removed. As heretofore constructed, these caps have been formed of sheet metal attractively enameled. The neck of the bottle is threaded and the sheet metal cap
20 has a thread rolled into it which fits the thread on the bottle. The thread is of a coarse pitch so that a single turn of the cap suffices to screw it on tightly.

Various attempts have been made to provide
25 plastic caps to replace the sheet metal caps now commonly used. Plastic caps are desirable because of the more attractive appearance which they present; because they are not attacked by the contents of the bottle so that they do not
30 become corroded or discolored and because of the ready manner in which embossed decorations, trade-marks, etc. can be provided in the plastic material. Heretofore, however, there have been several difficulties encountered in the provision of
35 a plastic cap in the nature of a dust cap to take the place of the sheet metal caps now commonly provided. A major difficulty has been that, if the walls of the cap are made thin enough so as not to make the top of the bottle look bulky and are provided with an interior thread to engage the thread
40 on the neck of the bottle, the cap will very easily split when it is screwed down tightly. Users frequently try to screw the cap on tightly, and the "Bakelite" or other plastic material splits readily
45 under the expansive force exerted under these conditions. Moreover, a cap which is made heavy enough to resist splitting contains so much "Bakelite" or other plastic material that it cannot be sold in competition with the very thin sheet metal caps now generally used. It has been proposed to use some other type of connection than a thread between the cap and the bottle, but this necessitates a change in the bottle molds and the users of bottles are unwilling to assume the expense of
55 making the change. A further objection to the

general use of plastic caps for this particular purpose is encountered in the cost of molding these caps with an internal thread as compared with the lesser cost of manufacturing a sheet metal cap.

According to the present invention, a closure is provided which is adapted for use on standard threaded bottles and similar containers without any alteration or change in the bottle or the thread of the bottle or which may be used on containers having specially formed necks. At the same time, the wall thickness of the cap is such that it does not present a bulky appearance at the top of the bottle and the amount of material required for its manufacture is such that it can be
15 manufactured as cheaply or cheaper than a lithographed sheet metal cap. Moreover, the present invention provides a cap which does not require the use of internal threads but which, nevertheless, is constructed to cooperate with the threads
20 on the neck of a bottle. The design and construction of the cap, moreover, is such that, under normal conditions of use, the splitting of the cap when it is screwed on will not occur.

According to the present invention, the plastic
25 cap is molded in the form of a cup having a relatively thin wall but having a diameter slightly greater than the maximum outside diameter of any portion of the neck of the bottle enveloped by the cap. Formed on the interior of this cap there
30 are one or several but preferably two small projections, these projections preferably being diametrically opposite each other. They project far enough inwardly toward the center of the cap to engage the thread or other abutment on the neck
35 of the bottle when the cap is applied to the bottle. As the cap is turned, these projections will engage the thread of the bottle if the bottle has a threaded neck and cause the cap to be screwed down as the cap is turned. When the cap is
40 screwed down as tightly as it will go, any further turning of the cap will cause these projections to ride up over the thread. Since the cap has relatively thin walls and since it has a diameter slightly greater than the outside diameter of the
45 thread, it is free at this time to assume a somewhat elliptical form, the two button-like projections being on the major axis of the ellipse while the portions of the cap at 90° away from the buttons are drawn against the sides of the threads,
50 the two points diametrically opposite each other and 90° from the projections being at the minor axis of the ellipse. As a matter of fact, the cap may be forced vertically down without turning. If the bottle has an annular ridge or enlargement, 55

rather than a thread the projections will snap thereover.

The invention may be more fully understood by reference to the accompanying drawing, in which;

5 Figure 1 shows a portion of a standard container in elevation, the cap embodying the present invention being shown applied thereto, the cap being in section;

10 Figure 2 represents a transverse section on the plane of line II—II of Figure 1, the view being on a larger scale than Figure 1 and showing the contour of the cap during the normal engagement of the projections with the thread of the bottle;

15 Figure 3 is a view similar to Figure 2 but showing the cap distorted to the elliptical form which it assumes at the moment when the projections are riding over the tops of the threads; and,

20 Figure 4 is a view similar to Figure 3, showing a modification wherein there is a single internal projection.

In the drawing, the reference numeral 2 designates a receptacle, such, for instance, as a catsup bottle, having an enlargement or abutment such as a thread or the neck 3 thereof, the abutment or thread on the neck being designated 4. While I have specifically illustrated a bottle having a thread, it will be understood that this is for purposes of illustration and that instead of a thread, the bottle might have an annular enlargement or bead in lieu of a thread. Threaded bottles being now generally used, the invention will be specifically described in connection with such bottles. Below the threaded portion of the neck there is the customary bead 5. This is a typical form of receptacle and per se forms no part of the present invention.

35 The cap designated 6 has a top portion 6a and a side portion 6b. The cap 6 is formed of molded material of a frangible nature, such as "Bakelite", hard rubber, or similar composition material. The walls thereof are relatively thin, being sufficiently thin to have a slight degree of flexibility under the conditions hereinafter described. It will be seen from Figure 1 that the thickness of the walls is such that the outside diameter of the cap is a little larger than the outside diameter of the bead 5, so that the cap does not present a bulky or unwieldy appearance at the top of the receptacle.

40 The inside diameter of the cap is, as shown in Figure 2, slightly larger than the outside diameter of the thread or other abutment 4 on the neck of the bottle. As shown in Figure 2, the inner surface of the walls 6b of the cap are provided with inwardly projecting buttons or lugs 7 and 8. These buttons or lugs being diametrically opposite and being located a predetermined distance above the lowermost edge of the cap, project inwardly toward the center of the cap far enough so as to cooperate with the thread 4, but they preferably do not extend into the full depth of the thread.

45 It will be readily seen that when the cap is applied to the neck of the bottle, it will drop down until the buttons or lugs engage the thread. Then, the cap may be turned and, when it is turned, it will screw down just as though it had internal threads. If, however, the turning of the cap is forced after the top portion 6a engages the end of the bottle or after the lower edge of the cap engages the bead 5 so that the cap cannot screw down further, the buttons 7 and 8 will merely tend to ride up on the threads and snap over them. If the cap were of the same interior diameter as the exterior diameter of

the thread 4, the cap would, under these conditions, split. However, by reason of the cap having an internal diameter slightly greater than the maximum exterior diameter of the thread, this splitting does not occur. This may be readily understood by reference to Figure 3 where it will be seen that as the points a on the cap skirt are forced outwardly by the projections riding up on the thread or other enlargement on the bottle neck, the intervening portions of the cap are drawn inwardly, the points b having the greatest radial movement inward. The cap thus assumes an elliptical form with a line through a—*a* as the major axis of the ellipse and with a line through b—*b* being the shorter or minor axis of the ellipse. As soon as the projections ride over the highest part of the thread, the inherent resilience of the cap causes it immediately to re-assume a circular form.

By reason of this construction, I am enabled to provide a plastic cap wherein thin walls are used and wherein thin walls are a desirable attribute. The cost of manufacturing the caps is extremely low because of the relatively small amount of material required and because of the fact that the molds do not have to be provided with internal threads. The plastic caps can, therefore, be snapped from the forming molds instead of being unscrewed, as is the case with "Bakelite" caps having thicker walls and having internal threads. As a matter of fact, the cap provided by the present invention does not have to be screwed onto the bottle. It can be merely placed on the top of the bottle and then pressed. As it is pressed, the buttons or projections 7 and 8 will snap over the threads just as they do when the cap is forced after it has been screwed down. It is by reason of this arrangement that the cap may be used where the bottle has an enlargement or bead rather than a thread. While I have shown the cap as having a perfectly plain cylindrical contour, it is obvious that it may be molded with various devices for ornamentation or trade designations as the particular user may desire.

45 While two internal projections 7 and 8 are preferable for most cases, there may be on some caps, particularly those of exceptionally large diameter, more than two internal projections. Moreover, instead of there being a plurality of internal projections, there may be but a single internal projection. This is illustrated in Figure 4 where the cap designated as 10 is provided with a single internal projection 11. In this case, when the projection 11 is forced over the thread, the cap not only takes the form of an ellipse, as described in connection with Figure 3, but it is also drawn to a position eccentric to the neck of the bottle. In the case of a single internal projection, as with a plurality of internal projections, it is necessary for the internal diameter of the cap to be very slightly greater than the outside diameter of the thread in order to allow the cap to assume this slightly elliptical form.

50 The cap as provided by the present invention presents several advantages over a thread cap. In the first place, being free of internal threads, there are no surfaces which can not be easily cleaned. If the cap is used on a bottle containing liquor, or other fluid where the cap may be used as a measure or cup, the absence of threads to catch and retain the liquid is an important advantage. This is also true where the cap is used on a bottle containing salt, as for instance, a bath salt, and the cap used as a measure. The

threads now generally provided catch and hold the contents poured into the cap.

While I have illustrated and described certain particular embodiments of my invention, it will be understood that the invention is not limited to these embodiments and may be variously modified and that it is applicable to containers of a character and shape different from the particular form illustrated.

I claim:

1. The combination with a receptacle having a threaded end portion, of a frangible plastic cap engaged over said threaded end, said cap having an internal diameter greater than the maximum exterior diameter of the threaded portion of the receptacle and having a plurality of inwardly extending button-like projections on the inner wall thereof cooperating with the thread of the receptacle, the length of the projections and the internal diameter of the cap being so related as to

enable the projections to be forced over top of the thread by allowing portions of the side walls of the cap intermediate the projections to yield radially inwardly sufficiently to allow said projections to snap over the threads without rupturing the cap, two of said projections being at diametrically opposite points.

2. The combination with a receptacle having a neck on which is a screw thread, of a plastic cap engaging the neck, said cap having an internal diameter greater than the maximum diameter of the threaded neck and having an inwardly extending button-like projection for cooperation with the thread, the internal diameter of the cap and the thickness of the walls thereof being such as to permit the projection to move radially outward and snap over the thread to prevent the cap from splitting when it is screwed down tightly on the thread.

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