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2,181,179

CLOSURE FOR BOTTLES AND JARS AND METHOD OF MAKING THE SAME

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Fig. 1.

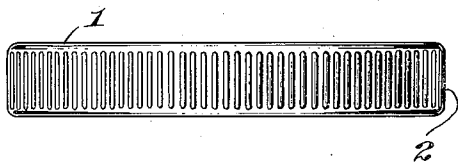


Fig. 2.

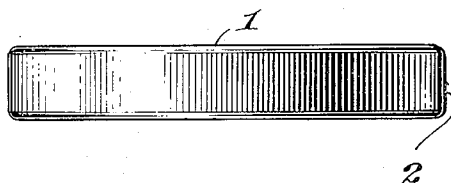


Fig. 3.

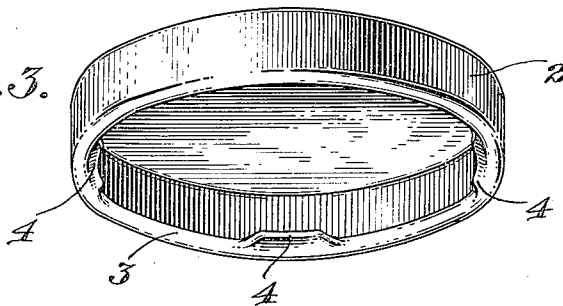


Fig. 4.

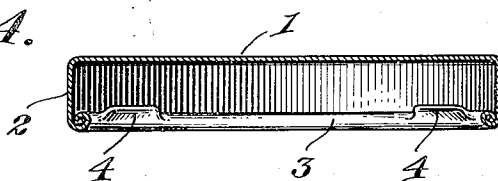
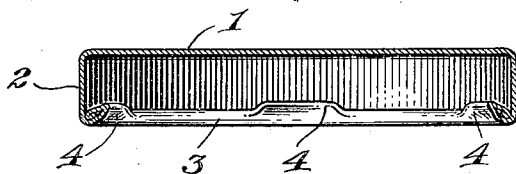


Fig. 5.

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UNITED STATES PATENT OFFICE

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CLOSURE FOR BOTTLES AND JARS AND
METHOD OF MAKING THE SAMEHoward R. Eccleston, Washington, D. C., assign-
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23 Claims. (Cl. 113—121)

Metallic closures which are turned into sealing position on the bottle, jar, or other container, are of two varieties, known in the trade as the continuous thread cap and the lug cap. Each of these two types of cap possesses certain advantages over the other; some users preferring the continuous thread cap, and other users preferring the lug cap. Both types of caps have, however, the common disadvantage of being more or less unsightly; the threads detracting from the appearance of the continuous thread cap, and the lugs detracting from the appearance of the lug cap. In recent years the unattractive appearance of both types of caps has been emphasized by the molded cap, which has become quite popular and which has its exterior entirely smooth throughout.

The molded cap has, of course, a far more pleasing appearance than the old continuous thread cap or the old lug cap; but the molded cap lacks certain practical advantages of the metallic caps, and is also much more expensive than the metallic caps. Accordingly, since the molded cap came into general use, it has become important in the metallic cap industry to produce caps which will have the attractive appearance of the molded cap but which will at the same time possess the practical advantages of the metallic cap.

Prior to the present invention the demand for such a metal cap has been answered by what is commonly known as the double-shell cap. Such cap consists of a smooth outside shell placed over an inner shell which is threaded; the two shells being secured together against relative rotation. This double-shell metallic cap does possess both the pleasing appearance of the molded cap and the practical advantages of the metallic cap. The disadvantage of the double-shell cap is that it is considerably more expensive than the ordinary turn-on cap of either the continuous thread or lug type, although it is much less expensive than the molded cap.

Prior to the present invention there has not been produced any practical single shell cap which is turned into sealing position and which possesses the attractive appearance of the molded cap. The main object of the present invention is to provide such a cap.

Another object of the invention is to provide a cap having these characteristics, which may be easily manufactured, and which is as inexpensive as the old style metallic caps in which the threads or lugs are exposed to view.

The present invention possesses numerous other advantages which will be apparent to those skilled

in the art from the following detailed description, when taken in connection with the accompanying drawing; in which,

Figure 1 is a side elevational view of the cap.

Figure 2 is a view similar to Figure 1, but with the exterior entirely plain.

Figure 3 is a perspective view of the cap from below.

Figure 4 is a vertical transverse sectional view taken through the inturned bead.

Figure 5 is a view similar to Figure 4, but with the section being taken through the lugs.

Referring to the drawing in more detail, numeral 1 refers to the top of the cap, from which depends the usual skirt 2. This skirt may be decorated with knurls, as shown in Figure 1, or may be entirely plain as shown in the other figures. Of course the cap is provided with the usual liner (not shown), when desired.

In the old and well known commercial lug cap the lower portion of the skirt is curled outwardly and upwardly to form an exterior bead at the bottom of the cap, and portions of such bead were deformed to form lugs. In such type of cap the appearance was marred both by the exterior bead and by the deformed portions of the bead which formed the lugs. In a modified form of this old lug cap the portions of the bead which were deformed were also pushed inwardly, so that portions of the bead were on the outside of the skirt and other portions were on the inside thereof. While this may have improved the cap from a practical standpoint it obviously did not improve the appearance thereof.

In accordance with the present invention the lower portion of the skirt is curled inwardly and upwardly, as indicated by numeral 3, so that the bead is entirely hidden from view, and the lower edge of the cap presents the smooth rounded appearance of the molded cap. The inturned bead 3 having been formed, the lugs 4 are now struck from this bead. In the specific embodiment illustrated, four lugs are employed, but of course the number and size of the lugs are varied as desired. These lugs are so positioned that they are entirely hidden from view, and the portions of the bottom edge of the cap beneath the lugs retain exactly the same smooth rounded appearance as the remainder of the edge of the cap, so that the cap, when decorated, simulates the appearance of the molded cap in every respect, and yet retains all the advantages of the metallic cap. And, of course, the cost of production of this cap is much less than that of the double-shell cap mentioned hereinbefore, which is itself much less expensive

than the molded cap. So that the present invention provides, for the first time, a practical single shell metallic cap which is turned into sealing position on a container, and which by having its entire outer surface smooth and plain, and by hiding from view both the bead and locking lugs, exactly simulates a molded cap, but retains all the advantages of the metallic cap and is far less expensive than either the molded cap or the double-shell metallic cap.

The prior patented art, as distinguished from the prior commercial art, does contain some suggestions of single shell turn-on caps of both the continuous thread and lug type, which are supposed to present a plain exterior; but in every instance the proposed construction is either impractical in manufacture or the exterior is deformed to some extent, and in some instances the suggested constructions possess both of these fatal defects. One of the prior patents (Hardiman, No. 1,810,706, June 16, 1931) does suggest that the lower portion of the cap be turned inward to form an interior bead, but it does not suggest that lugs be struck from such interior bead. On the contrary, it suggests that after the interior bead has been formed, all of it be flattened except several portions which are left normal, and these normal portions are supposed to function as lugs. In the first place, it is apparent that such a construction is not practical, for there would be an entire lack of uniformity in lugs formed in any such negative manner, and, of course, the uniformity of the lugs is of prime importance; and, in the second place, the appearance of the exterior of the cap is necessarily different where the bead is flattened from where the bead is left normal, as the patent plainly shows. Unless the exterior of the cap is entirely free of any deformation, it does not simulate a molded cap and is not an advance over the old lug cap or old continuous thread cap. As indicated hereinbefore, the single shell cap constituting the present invention is entirely free of any exterior deformation.

The specific embodiment disclosed herein may be changed or modified in various respects without departing from the spirit of the invention, and all such changes and modifications are intended to be included within the scope of the appended claims.

Having fully described the invention, what I claim as new is:

1. A lug cap comprising a top and a downwardly depending skirt having a uniformly cylindrical external lower end terminating in an inwardly rolled portion, the cross-sectional arcuate curve of the roll between the cylindrical portion of the skirt and the locus of substantially lowermost points on the rolled portion being substantially constant at all points around the circumference of the skirt, the cross sectional curve of said roll from said locus inwardly of the cap being struck on different radii at different points around the circumference of the skirt, whereby certain portions of the roll project inwardly more than other portions and form locking lugs.

2. A lug cap comprising a top, and a downwardly depending uniformly cylindrical skirt terminating in an inwardly rolled portion, the cross-sectional arcuate curve of the roll between the cylindrical portion of said skirt and the substantially lowermost point on the rolled portion being substantially constant at all points around the circumference of the skirt, the cross-sectional inner curve of said roll from said lowermost point

inwardly of the cap being substantially equal to said first-mentioned curve except at spaced points where said inner curve is struck on a longer radius, to form inwardly projecting locking lugs at said spaced points.

3. A lug cap comprising a top, and a downwardly depending uniformly cylindrical skirt terminating in an inwardly rolled portion, the cross-sectional arcuate curve of the roll between the cylindrical portion of said skirt and the substantially lowermost point on the rolled portion being substantially constant at all points around the circumference of the skirt, the cross-sectional inner curve of said roll from said lowermost point inwardly of the cap being substantially equal to said first-mentioned curve except at spaced points where said inner curve is struck on a path substantially flattened radially as compared to the curve of the remaining inner portion to form inwardly projecting locking lugs at said spaced points.

4. A lug cap comprising a top, and a downwardly depending uniformly cylindrical skirt terminating in an inwardly rolled portion around the entire circumference of the skirt, the cross-sectional arcuate curve of the roll between the straight cylindrical portion of said skirt and the lowermost point on the rolled portion being substantially constant at all points around the circumference of the skirt, the cross-sectional curve of said roll from said lowermost point inwardly of the cap being struck on a longer radius than said first-mentioned curve at spaced points around the skirt to form inwardly projecting locking lugs at said points.

5. A lug cap comprising a top, and a downwardly depending uniformly cylindrical skirt terminating in an inwardly rolled bead around the entire circumference of the skirt, each point on the lowermost edge of said bead lying in a plane parallel to said top, whereby said cap skirt presents a uniform smooth lower edge, the cross-sectional curve of the inner portion of the bead being struck on different radii at different points, the portions on the larger radii forming locking lugs.

6. A lug cap comprising a top, a downwardly depending uniformly cylindrical skirt terminating in a portion rolled inwardly beyond the cylindrical skirt and extending continuously around the entire circumference of the skirt, the cross-sectional arcuate curve of the roll between the straight skirt portion and the lowermost point on the roll portion being substantially constant at all points around the circumference of the skirt, the cross-sectional shape of the continuously extending, inner portion of the roll being different on different axial planes, said inner portion of the roll forming locking lugs at spaced points.

7. A lug cap comprising a top and a downwardly depending cylindrical skirt terminating in a continuous inwardly rolled portion extending inwardly beyond the cylindrical portion of the skirt around the entire circumference thereof, the cross-sectional arcuate curve of the roll between the cylindrical portion of said skirt and the locus of substantially lowermost points on the rolled portion being substantially constant at all points around the entire circumference of the skirt, whereby said cap presents a uniform exterior surface at its lower edge, the continuous rolled portion, inwardly of the lower edge being provided with locking projections, each of said

projections presenting a convexly rounded thread engaging surface.

8. A closure cap for receptacles, comprising a top, a cylindrical skirt depending therefrom, an inwardly rolled bead at the lower edge of said skirt extending around the entire circumference and disposed interiorly thereof and shaped at spaced points to present inwardly projecting, convexly rounded locking lugs for engagement with a thread on said receptacle, said bead and said lugs being normally hidden from view by said skirt, the lower edge of said skirt which merges with said bead being uniform throughout the entire circumference of the cap, and being undeformed by the pressure of said lugs.

9. A lug cap comprising a top, depending cylindrical skirt, and a continuous, rolled bead at the lower edge of said skirt extending inwardly around the inner periphery thereof, the cross-sectional curve of said bead between the cylindrical skirt portion and the locus of substantially lowermost points on said bead being constant at all points, the cross-sectional curve of that portion of said continuous bead disposed interiorly of said locus being different at differing points along said bead to form inwardly projecting locking lugs.

10. A closure cap for receptacles, comprising a top, a cylindrical skirt depending therefrom, an inwardly and upwardly rolled bead at the lower edge of said skirt extending around the entire circumference and disposed interiorly thereof and shaped at spaced points circumferentially in its rolled portion to present inwardly projecting rounded locking lugs for engagement with a thread on said receptacle, said bead and said lugs being normally hidden from view by said skirt, the lower edge of said skirt which merges with said bead being uniform throughout the entire circumference of the cap, and being undeformed by the presence of said lugs.

11. A lug cap comprising a top and a downwardly depending cylindrical skirt terminating in an inwardly and upwardly rolled portion extending entirely around the inner periphery thereof, the cross-sectional curve of the roll between the cylindrical portion of the skirt and the locus of substantially lowermost points on the rolled portion being substantially constant at all points around the circumference of the skirt, whereby said cap presents a uniform exterior surface at its lower edge, and the upwardly rolled portion being provided inwardly of the lower edge at spaced points in its circumference with locking projections, each of said projections presenting a thread engaging surface which is rounded circumferentially of the skirt.

12. The method of making a closure cap from a blank having a top and a substantially cylindrical flange terminating in a free edge, which comprises the steps of curling the free edge of the flange radially inwardly to form a bead entirely within the interior of the cap, flattening circumferentially spaced portions of the bead, and thereby projecting the relatively flattened portions radially inwardly beyond the adjacent curled bead portions to form locking lugs for said closure cap.

13. The method of forming metal lug caps which comprises turning the lower portion of the skirt inwardly and upwardly to form a bead of substantially uniform cross-sectional curvature between the bottom of the bead and the cap skirt throughout the circumference of the skirt, and deforming the bead to produce at circumferen-

tially spaced points about the cap flattened inwardly projecting double thickness lugs with rounded edges.

14. The method of forming metal lug caps which comprises turning the lower portion of the skirt inwardly, upwardly and outwardly to form a bead of substantially uniform cross-sectional curvature between the bottom of the bead and the cap skirt throughout the circumference of the skirt, and deforming the bead to produce at circumferentially spaced points about the cap flattened inwardly projecting double thickness lugs with rounded edges.

15. A lug cap comprising a top and a downwardly depending uniformly cylindrical skirt terminating in a bead having the metal turned inwardly, upwardly and outwardly, the cross-sectional curve of the bead between the straight skirt portion and the lowermost point on the bead being substantially constant at all points around the circumference of the skirt, concealed locking lugs at circumferentially spaced points about the cap, said lugs formed of the metal of the bead flattened upon itself, whereby the lugs are of double thickness and with the raw edge of the metal unexposed to contact with the container upon which it is mounted.

16. A lug cap comprising a top and a downwardly depending uniformly cylindrical skirt terminating in a bead having the metal turned inwardly, upwardly and outwardly, the cross-sectional curve of the bead between the straight skirt portion and the lowermost point of the bead being substantially constant at all points around the circumference of the skirt, concealed locking lugs at circumferentially spaced points about the cap, said lugs formed of the metal of the bead flattened upon itself, whereby the lugs are of double thickness and with the raw edge of the metal unexposed to contact with the container upon which it is mounted, and said double-thickness lugs being inclined upwardly toward the top of the cap.

17. In a cap closure having an annular skirt, a base rim thereon extending inwardly and providing a continuously uniform unbroken exterior surface around the bottom of said skirt, said base rim being extended upwardly within said skirt around the entire circumference of said rim, inwardly projecting locking lugs carried by said base rim within said skirt, the base of each lug being spaced above the bottom edge of said rim whereby the uniform continuity of the lower edge of the rim is preserved, said base rim also carrying portions extending upwardly therefrom between said lugs and merging therewith.

18. In a cap closure having an annular skirt, a base rim thereon turned inwardly and upwardly from the lower edge of the skirt around the circumference thereof, said rim lying entirely within the interior of the cap, said base rim being flattened upon itself at points in its circumference to produce inwardly extending double-thickness locking lugs at said points, portions of said rim extending upwardly above the bottoms of said lugs and merging with said lugs.

19. In a cap closure having an annular skirt, a base rim thereon extending inwardly and providing a continuously uniform unbroken exterior surface around the bottom of said skirt, said base rim being extended upwardly within said skirt around the entire circumference of said rim, said base rim being flattened upon itself at points in its circumference to produce inwardly projecting double-thickness locking lugs at said points.

20. In a cap closure having an annular skirt, a base rim turned inwardly and upwardly from the lower edge of said skirt and extending around the circumference of the skirt, the upwardly extending portion of said rim being spaced inwardly from said skirt and being of substantially uniform height throughout substantially the entire circumference of said rim, said rim having portions projecting inwardly with respect to the skirt at spaced points in its circumference to form inwardly projecting locking lugs at said points, said lugs including parts of said upwardly extending portion of said rim, other parts of said upwardly extending portion of said rim projecting between said lugs and merging with the tops of the lugs.

21. A single shell lug cap including a top and a skirt, a bead formed at the bottom of the skirt and comprising an inwardly turned portion extending around the circumference of the skirt and a portion extending upwardly from said inwardly turned portion around the circumference of said skirt, said bead also comprising a raw edge entirely within the interior of the cap, said bead being shaped at spaced points in its circumference to produce at said points substantially flat double-thickness inwardly extending locking lugs.

22. As an article of manufacture, a closure cap having a depending skirt with the base thereof having portions extending inwardly, upwardly, and downwardly throughout the circumference of

the cap to form a double-thickness metal rim at the bottom of the skirt, and a second double-thickness metal rim above the bottom of the skirt with the downwardly extending raw edge enclosed between the inside of the skirt and the aforesaid upwardly extending portion, said upwardly and downwardly extending portions being deformed with respect to said skirt at spaced points in their circumference to provide inwardly projecting double-thickness lugs at said points, said lugs being adapted to engage the lower side of a container thread or projection, the double-thickness metal forming the lugs being edgewise disposed to the forces pulling the cap down on the container to increase the strength of the lugs and to prevent the lugs from riding over the threads or projections on the container when the cap is screwed thereon.

23. The method of making a closure cap from a blank having a top and a substantially cylindrical flange terminating in a free edge, which comprises the steps of curling the free edge of the flange radially inwardly and upwardly to form a continuous bead around the circumference of said flange, applying a force to circumferentially spaced portions of the bead to decrease the curvature thereof and thereby projecting said circumferentially spaced portions radially inwardly beyond the adjacent curled bead portions to form locking lugs for said closure cap.

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