

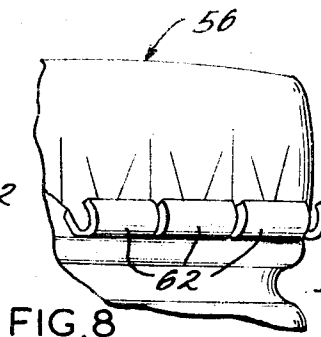
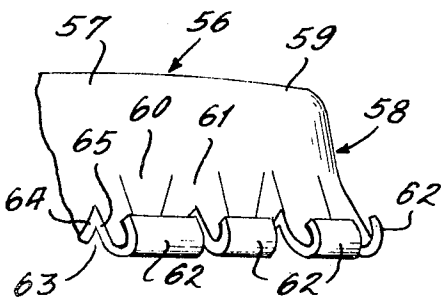
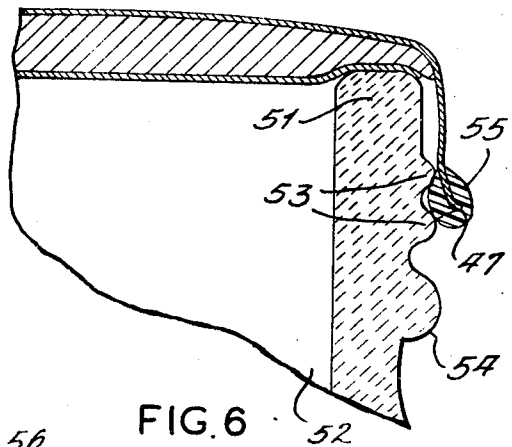
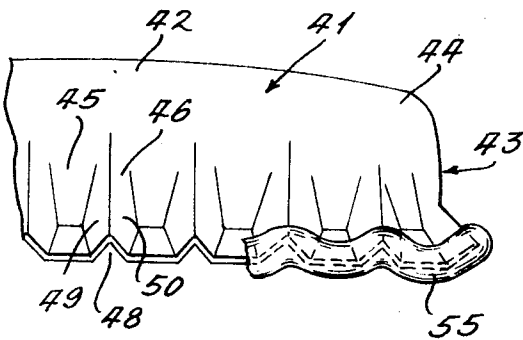
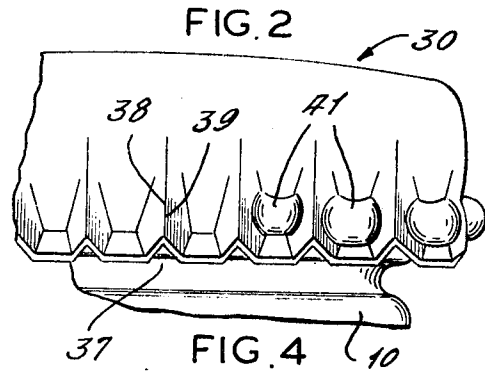
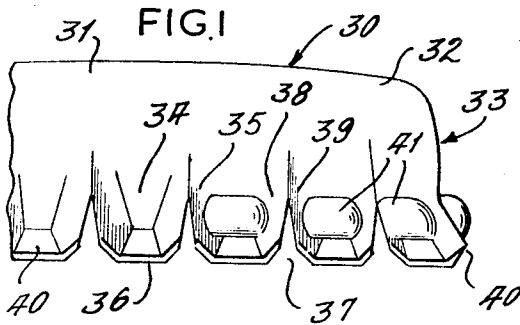
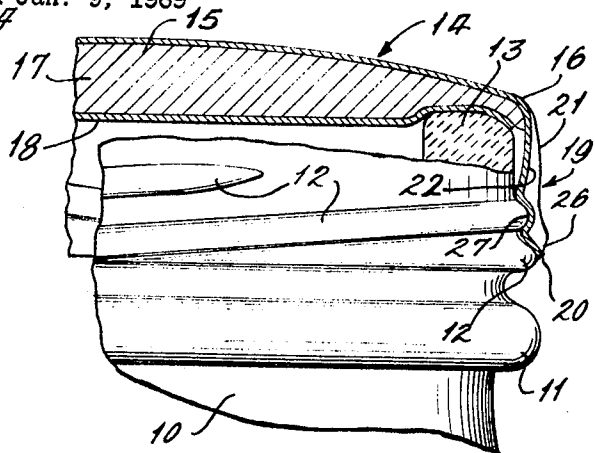
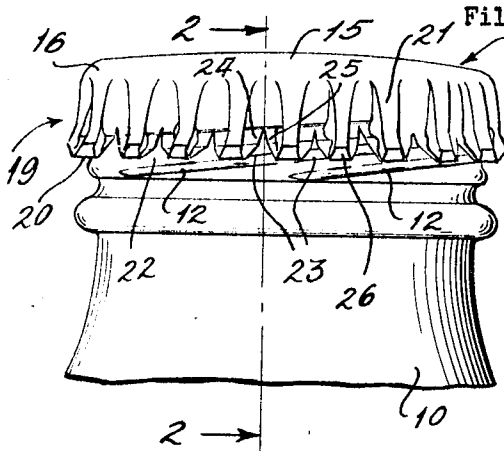
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3,514,004

CROWN CLOSURE HAVING PROTECTIVE EDGE MEANS

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3,514,004

## CROWN CLOSURE HAVING PROTECTIVE EDGE MEANS

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6 Claims

### ABSTRACT OF THE DISCLOSURE

A container closure having a construction that avoids sharp edges and surfaces and makes it safer and easier to remove the closure by hand and is especially adapted for the twist-off closures that are crimped into place over threads formed around the pouring mouth of the container.

This invention relates to improvements in closure means for containers and is particularly concerned with the type of closure that is crimped over threads formed around the pouring mouth of a container so that the closure may be twisted off by hand to open the container.

For many years beverage containers have been closed and sealed by the well known crown cap. This cap is formed of metal and is crimped into place and retains its sealing power by the formation of a plurality of ribs spaced around the cap. It is the way the ribs are formed that produces the sharp edges and surfaces. This has always been a problem which is now magnified. Now that twist-off crown caps are desired for closing and sealing threaded containers, the former design and construction will no longer suffice as the former difficulties of injury when attempting to twist off the cap or even more serious, and no satisfactory solution has appeared.

The objects of this invention are to provide a closure structure for containers that can be adapted to twist-off caps; to provide a closure structure for containers that will be free of sharp edges and surfaces to reduce and substantially eliminate injury to anyone opening the container by hand; and to provide a closure structure for containers that can be crimped into position over a thread to produce a secure seal and in the crimping process substantially eliminate sharp edges and surfaces.

It is an additional object of this invention to provide means for modifying the present crown caps so that the usual sharp edges of the serrations may be easily blunted or finished off, thereby adapting the caps for use with containers having threaded crowns.

This invention may be embodied in a crown type closure cap that is stamped from sheet material and formed into a cap having the ribs in the skirt modified to allow the ribs to close down and draw together in the circumferential direction, thereby eliminating protruding surfaces that have heretofore been the cause of sharp edges. In the shaping of the ribs, the usual rib points are eliminated and reshaped to present a flattened surface which with other such surfaces constitutes an interrupted band effect in the skirt.

The invention may be embodied also in a crown type closure cap that is provided with means applied to the skirt portion, or to the usual sharp edges and surfaces, to build up a protective medium thereon which prevents the edges from being exposed to cause injury.

The invention also may be embodied in other structures hereinafter set forth in the accompanying description and drawings, wherein:

FIG. 1 is a fragmentary view of a beverage container having a mouth formed with a screw thread to receive

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a crown type closure cap which exhibits the characteristics of the present invention;

FIG. 2 is a greatly enlarged and fragmentary sectional elevational view taken at line 2—2 in FIG. 1;

FIG. 3 is a fragmentary elevational view of a crown type closure cap disclosing a modification prior to the cap being placed on a container;

FIG. 4 is a fragmentary view of the cap of FIG. 3 after being crimped on a container;

FIG. 5 is a fragmentary elevational view of a crown cap showing a modified embodiment;

FIG. 6 is a greatly enlarged sectional view of the cap of FIG. 5 after being crimped on a container;

FIG. 7 is a fragmentary view of still another embodiment of this invention; and

FIG. 8 is a fragmentary view of the modified cap of FIG. 7 after being crimped on a container.

Referring now to FIGS. 1 and 2 of the drawings, there is shown a beverage container 10 having at its pouring mouth one or a series of thread shaped beads 12 encircling the container and ending at the lip portion 13 of the pouring mouth. The presently improved crown cap is adapted to be crimped over the thread beads 12 of the container 10 as is shown in the two views referred to.

One form of twist-to-remove crown cap is shown in FIGS. 1 and 2 at 14 and includes a cover portion 15 circumscribed by circumferentially extending shoulder 16 so as to constitute a cup shaped body for receiving the usual seal forming plug which may consist of a ply of cork material 17 having a foil liner ply 18 disposed over its surface so as to provide an impervious cover for the ply 17 and to form a secure seal at the abutment with a pouring lip 13. Instead of the cork ply the seal may be formed of resilient plastic material.

The improved crown cap 14 is distinguished from other crown twist caps or closures in that the depending skirt portion 19 is initially formed with a series of circumferentially spaced and alternating projecting ribs 21 and indentations 22. The ribs 21 extend downwardly to the outer free edge or margin 20 of the cap. Each indentation 22 in its uncrimped state is characterized by a V-shaped cutout 23 having edges 24 and 25 extending inwardly from the free edge 20. The alternating ribs 21 on the cap 14 are formed with a flattened nose 26 which in the uncrimped position (FIG. 1) are generally sloped substantially parallel to the longitudinal axis of the container 10.

It may be seen, particularly in FIG. 2, that when the cap 14 has been crimped around the thread bead 12 the indentations 22 are caused to conform at 27 to the shape of the thread beads. This results from the inward constricting of the ribs 21 and indentations 22 about the pouring lip 13. The inward constricting is accomplished by a circumferential reduction in the skirt 19 of the cap which circumferential reduction is permitted by the V-shaped cutouts 23, such that the spaced edges 24 and 25 are caused to close in and come to a new position closed toward each other or in substantial abutment. Concurrently with the circumferential constricting action permitted by the V-shaped cutouts 23, the nose surfaces 26 on the ribs 21 are brought closer together in the circumferential direction and are directed angularly inwardly as is shown in FIG. 2 so as to form an interrupted band or ring around the cap adjacent to the free edge 20 thereof.

In opening the crown cap 14 having the form and structure shown in FIGS. 1 and 2, the skirt 19 of the cap may be grasped in the bare hand and twisted relative to the container 10 in a direction to unthread the cap from the thread bead 12. The ribs 21, because they have the smooth though interrupted circumferential surface formed by the surfaces 26, may be easily grasped without danger of

cutting or scratching. The ribs 21 and indentations 22 make it considerably easier to grasp the skirt portion of the cap for purposes of twisting the cap in the unthreading direction.

The modified structure shown in FIGS. 3 and 4 is characterized by a crown cap 30 which has a cover portion 31 bounded by a shoulder 32 and a depending skirt portion 33. The skirt portion 33 has circumferentially spaced and alternating ribs 34 and indentations 35. The skirt portion 33 terminates in an outer free edge 36 and the indentations 35 between the respective ribs 34 are formed with a V-shaped cutout 37 having spaced margins 38 and 39 extending from the closed end of the cutouts 37. As can be seen in FIG. 4, when the cap 30 is crimped onto the container 10 and particularly over a thread shaped bead such as the bead 12 of FIG. 2, the edges 38 and 39 of the cutouts 37 close down upon each other and lie close together or in abutting relation so as to result in circumferential constricting of the skirt portion 33 as above described. Each of the ribs 34 is formed with a flattened outer end 40 so as to eliminate the usual sharp prong of the well known crown cap. In order to avoid the possibility of the skirt portion 33 cutting or scratching, small bodies of plasticized, rubberized or similar resilient material 41 may be secured over each rib 34. The bodies 41 are bonded or otherwise secured to the skirt portion 33 of the cap 30 so as not to be dislodged during the crimping operation or during transportation and subsequent handling of the container 10. The resilient bodies 41 are temporarily stressed during the crimping operation, but have a "memory characteristic" which will cause each of the bodies to revert back to its initial globular shape so as to make up an interrupted band around the circumference of the skirt 33 that will furnish a soft and comfortable gripping surface by which the cap may be held in the bare hand and twisted off the container.

Referring now to FIGS. 5 and 6 of the drawing, another form of the present invention is shown in connection with the modified cap 41 having a cover portion 42 and a depending skirt 43 joined to the cover 42 in the shoulder 44. The skirt 43 is formed into circumferentially spaced and alternating ribs 45 and indentations 46. The indentations 46 are formed at the free edge 47 of the skirt 43 with outwardly opening V-shaped cutouts 48 having spaced margins 49 and 50. The cap 41 is adapted to be crimped over the pouring lip 51 of the container 52 so that the skirt 43 can be crimped and constricted over the thread shaped beads 53 on the container mouth above the circumferential bead 54. The crimping action occurring in the skirt is permitted by reason of the spaced edges 49 and 50 of each indentation 46 closing downwardly into substantial abutment so as to permit the lips 45 to be circumferentially constricted over the thread beads 53. The cap 41 is prevented from cutting or tearing during the opening operation by being provided with a band 55 of material applied over the free margin or edge 47 of the skirt 43. The material 55 forms a bead which extends over the outside as well as the inside surface of the skirt and is caused to assume a position in gripping relation to the adjacent thread beads 53 as shown in FIG. 6. The material 55 may be applied before or after crimping and preferably consists of a resilient plastisol or rubber composition or it may consist of some of the soft metals such as solders, lead and the like.

In FIGS. 7 and 8, a further modification of the invention is shown in connection with a crown twist cap 56 in which the cover 57 is provided with a depending skirt 58 joined at the shoulder 59. The skirt 58 is provided with circumferentially spaced and alternating ribs 60 and indentations 61. Each rib 60 is formed with a tab or extension 62 which is spaced from other adjacent extensions 62 by an outwardly opening V-shaped cutout 63 having the spaced edges 64 and 65. In the uncrimped condition shown in FIG. 7 the tabs 62 are circumferentially spaced

and would normally present rough and somewhat sharp edges. However, in the crimped condition of FIG. 8 it is observed that the tabs 62 are brought into such near adjacency and substantial circumferential alignment that a rounded band or surface is provided which is interrupted by very small gaps. The close adjacency of the respective tabs 62 in the crimped condition of FIG. 8 is advantageous and is attained by the closing in of the edges 64 and 65 of each V-shaped cutout 63, whereby the skirt 58 may be easily circumferentially constricted around the thread beads 12 of a container of the type shown in FIGS. 1 and 2, or they may conform easily to the thread beads 53 of the container shown in FIG. 6. Each of the tabs 62 of the modified cap 56 is rolled outwardly and upwardly during the formation of the cap 56. The initial construction of the cap is such that on crimping the cap 56 provides an integral beaded edge made up of the circumferentially aligned and spaced tabs 62.

The invention above described in connection with some presently preferred embodiments shown in the drawings should be understood not to be limited merely to the modifications herein disclosed since other modifications may be made in accordance with the invention and without departing from the scope and the spirit of the appended claims.

What is claimed is:

1. A twist-to-remove crown cap for sealing a container mouth having a thread-shaped bead thereon, the cap comprising a cover portion defined within a circumferential shoulder, and a skirt portion forming a continuation of said circumferential shoulder and having a free outer edge, said skirt portion having a series of circumferentially spaced and alternating projecting ribs and indentations, each indentation having a cutout extending inwardly from said free outer edge, which cutouts are adapted to be substantially closed over the thread shaped bead and be conformed thereto upon crimping said cap skirt on the container mouth and said crimped skirt serving to retain the cover portion of said cap over the container mouth.

2. A cap as set forth in claim 1 wherein means on said cap at said free edge forms a gripping surface and blunts sharp edges.

3. A cap as set forth in claim 2 wherein said means consists of flattened surfaces on each of said ribs forming an interrupted gripping band for the cap.

4. A cap as set forth in claim 2 wherein said means consists of individual bodies of a resilient material having memory characteristics to return to an initial shape following distortion during crimping of the cap on the thread-shaped bead.

5. A cap as set forth in claim 2 wherein said means consists of pliable metallic material embedding said free edge of said skirt.

6. A cap as set forth in claim 2 wherein said means consists of a tab on each of said skirt ribs, each tab being curled and spaced from adjacent curled tabs, and said skirt having closable cutouts to allow closing of the tabs toward each other circumferentially upon crimping.

#### References Cited

##### UNITED STATES PATENTS

|           |         |             |          |
|-----------|---------|-------------|----------|
| 1,043,134 | 11/1912 | Nissinen    | 215—39   |
| 2,974,816 | 3/1961  | Ford        | 215—40   |
| 3,198,369 | 8/1965  | Jacques     | 215—39   |
| 3,203,570 | 8/1965  | Bindshedher | 215—39   |
| 3,382,997 | 5/1968  | Tsuji       | 215—46.5 |

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215—43