

[54] **NECK FOR WIDE-MOUTH JAR AND CAP THEREFOR**

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[52] U.S. Cl. **215/46 A, 215/42, 215/41, 220/54, 220/60**

[51] Int. Cl. **B65d 41/32**

[58] Field of Search **215/46 A, 41, 42, 9, 7; 220/54, 60**

[56] **References Cited**

UNITED STATES PATENTS

3,510,021 5/1970 Silver **215/46 A**

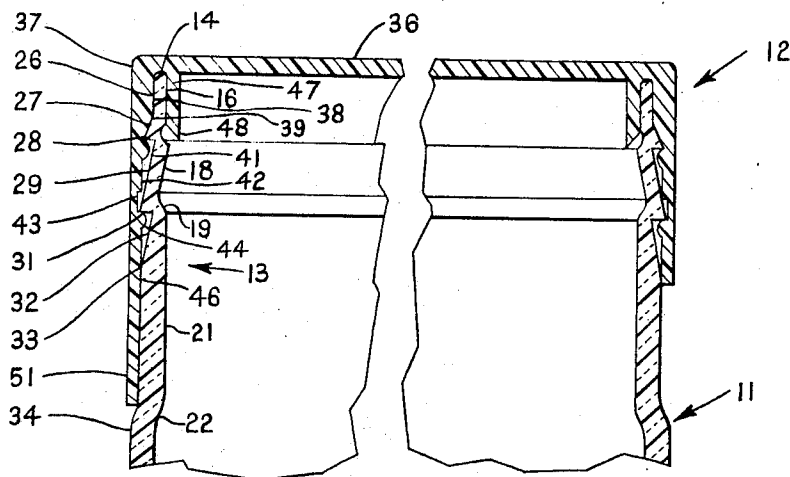
3,572,579 3/1971 Muller **220/54**
3,595,420 7/1971 Miskin **215/41**

Primary Examiner—George T. Hall
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[57] **ABSTRACT**

A wide-mouth jar of plastic or glass has an exterior neck finish comprising two circumferential, vertically spaced buttressed beads, the lower being of greater diameter than the upper. The plastic cap which fits on the neck has a flat-top disk with a peripheral skirt, the interior of which is formed with two circumferential beads dimensioned to engage immediately under the radial flanks of the beads of the neck. The wall of the skirt is weakened immediately above the lower cap bead in a circumferential internal groove which connects with two downward slanted internal grooves extending to the bottom of the skirt. A first finger grip tab depends from the bottom of the skirt to one side of the slanted groove to tear the cap along the grooves. A second tab depends from the bottom of the skirt between the downward slanted grooves to pry the cap off the neck.

10 Claims, 6 Drawing Figures



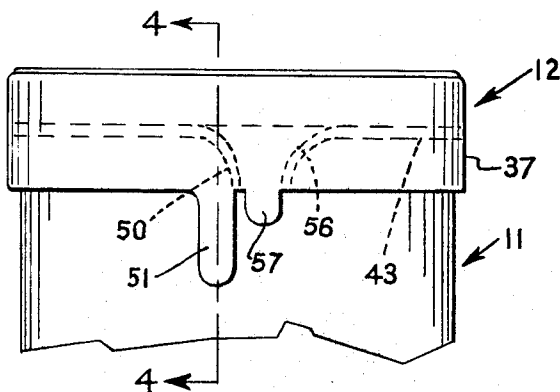


FIG. 1

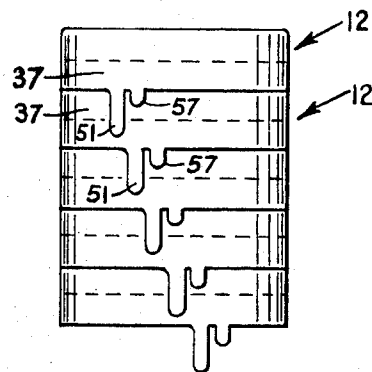


FIG. 2

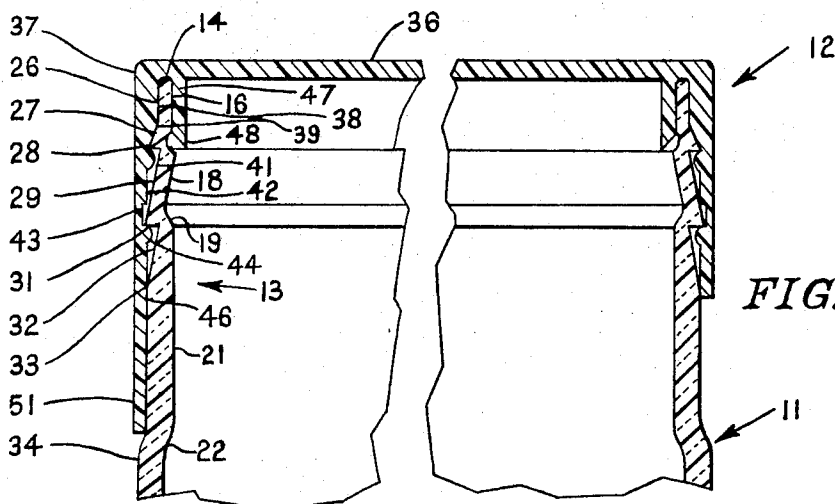


FIG. 4

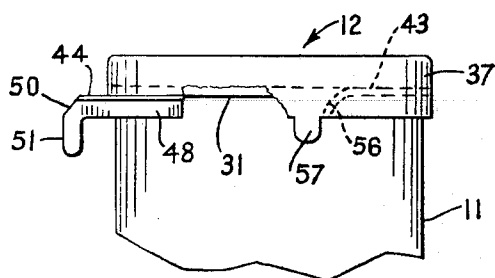


FIG. 3

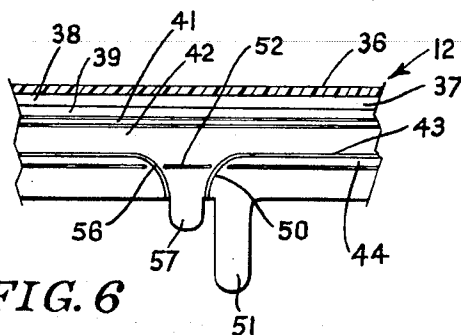


FIG. 6

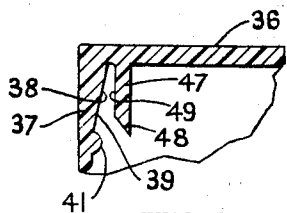


FIG. 5

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NECK FOR WIDE-MOUTH JAR AND CAP THEREFOR

This application is a continuation-in-part of co-pending application, Ser. No. 24,708 filed Apr. 1, 1970, and is an improvement upon U.S. Pat. No. 3,338,446 patented Aug. 29, 1967. The present invention is particularly suited to wide mouth bottles and jars.

When the bottles and jars of this general type are subjected to forces which tend to deform them such as occur during transportation or when the jar is dropped, the means tending to retain the cap on the jar neck tends to fail because the retaining means spring apart. A principal feature of the present invention is the fact that the jar neck and cap have cooperating retaining means which hold the parts in place despite severe stresses tending to dislodge the same.

The plastic cap has a depending skirt weakened with a circumferential score line intermediate two cooperating retaining means on the cap and jar neck so that the portion of the skirt below the score line may be torn off. Before the bottom of the skirt is torn away, it provides means to prevent tampering with the contents of the jar and also tending to retain the cap in place. After the skirt has been torn, the portion above the score line constitutes a re-closure cap which may be used repeatedly until the contents of the jar are exhausted.

A principal feature of the invention is the configuration of the score lines. Thus the circumferential score line is formed with a short interruption. A upwardly slanted first score line extends in a first angle from the bottom edge of the skirt to join the circumferential score line at one end thereof while downwardly slanted second score line extends at an angle opposite the first from the opposite end of the circumferential score line to the bottom edge of the skirt.

It is, therefore, an important feature of the invention to provide a closure wherein the seal must be obviously broken before access to the container is afforded. This is an aid in detection of tampering. On the other hand, the contour of the cap and jar neck facilitate installation of the cap on the neck but make it impossible to remove the cap without tearing a portion of the skirt.

Another feature of the invention is the fact that the cap may be installed on the jar very easily. This makes possible the use of production line closing techniques.

Another feature of the invention is the fact that the cap seals on the neck in such manner that a tight seal is effected which prevents leakage of the contents and also prevents ingress of contaminants.

Another feature of the invention is the provision of two tabs depending from the bottom edge of the skirt, one tab being gripped to facilitate tearing the lower portion of the skirt so as to permit opening the cap. The other tab, located below the above-mentioned interruption of the circumferential score line is gripped to facilitate initial and repeated removal from the neck of the portion of the cap which comprises a reclosure cap after the lower portion of the skirt has been discarded.

Still another feature of the invention is the facility with which the caps nest together for transportation and storage prior to being attached to bottles.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a side elevational view of a bottle neck and cap assembled in place.

FIG. 2 is a side elevation, in reduced scale, of a plurality of caps nested together for storage.

FIG. 3 is a view similar to FIG. 1 showing a portion of the skirt of a cap torn away preparatory to removing the cap from a neck.

FIG. 4 is an enlarged, fragmentary, sectional view taken substantially along line 4—4 of FIG. 1.

FIG. 5 is a fragmentary section of the cap with the skirt torn away, the cap being usable for reclosure.

FIG. 6 is a fragmentary elevational view from the interior of the cap.

Bottle or jar 11 and cap 12 may both be made of a plastic material such as polyethylene or polystyrene, or other suitable material which is slightly deformable under stress. The present invention may be used either with a plastic or glass bottle or jar as desired.

The neck 13 of such bottle has a horizontal lip 14. Below lip 14 the neck wall is substantially uniform in thickness. The interior of the neck 13 proceeding from top to bottom has a short cylindrical portion 16, a narrow concave portion 17, an outwardly-downwardly slanted conical portion 18, a second concave portion 19, an elongated substantially cylindrical portion 21 and an outwardly bowed portion 22. The exterior of neck 13, commencing from top lip 14 has a short cylindrical portion 26 of a length approximately equal to that of cylindrical portion 16. Below portion 16 is a buttress bead formed by an outwardly-downwardly slanted flank 27 which terminates abruptly in an inward directed horizontal flank 28 at an elevation approximately equal to that of concave portion 17 of the interior. Below flank 28 is another outwardly-downwardly slanted flank 29 which terminates in an abrupt inward directed horizontal flank 31 to form a lower buttress bead. Flank 31 has a greater maximum diameter than flank 27. Flank 31 is below the elevation of concave portion 19. Below flank 31 is an outwardly-downwardly slanted portion 32 which terminates in an elongated cylindrical surface 33 opposite surface 21 and this terminates in turn in an outwardly directed portion 34 opposite portion 22. The exterior of the neck 13 is of considerable importance in the present invention. It will be noted that the flanks 27, 28 form in effect a buttress shaped bead and that the flanks 29, 31 form a similar buttress shaped bead. The outside maximum diameter of the flank 29 is slightly greater than that of flank 27. In other words, the upper buttress bead is smaller than the lower.

Directing attention now to cap 12, the top disk 36 is circular and has a skirt 37 depending from the periphery thereof. Skirt 37 is substantially cylindrical on its exterior but the interior thereof is of irregular shape. Proceeding from the top of the interior of skirt 38 there is a short cylindrical inner surface 38 which matches in length cylindrical portion 26 and the disk merges into an outwardly-downwardly slanted surface 39 which terminates at the elevation of flank 28 and has below it an internal bead 41 which is substantially semi-circular in cross-section and in the assembled position of the cap and jar neck immediately under flank 28. Below bead 41 there is a cylindrical surface 42 which has indented therein an approximately rectangular cross-section groove 43. The lower edge of groove 43 is opposite flank 31. Below groove 43 is a bead 44 which in the assembled position of cap and jar, nests immediately below flank 31. Bead 44 is of a semi-circular cross-section. Below bead 44 is a cylindrical portion 46 which extends down to the bottom edge of skirt 37. Spaced inwardly of skirt 37 depending from the bottom of disk 14 is an internal skirt 47 which is cylindrical on its inner surface and on its outer surface rests against surface 16 with a tight fit. As shown in FIG. 5, the outer surface 49 of skirt 47 and the skirt surface 38 of skirt 37 converge upwardly and are deformed by lip 14 when the parts are assembled. To facilitate installation of the cap, the lower outer edge of skirt 47 is beveled as indicated by reference numeral 48.

The groove 43 is a weakening of the wall thickness of the skirt 37 and extends circumferentially around said skirt, except for the aforementioned interruption. The thickness of the material at the situs of groove 43 is such that the cap 12 does not rupture unintentionally but is easily torn. At one location, a first downward slanted starting groove 50 extends from the left end of the interruption of groove 43 down and to the right to the bottom edge of skirt 37 (see especially FIG. 1). To the left side of the terminus of groove 50 is a first tab 51 which is conveniently gripped by the fingers. At the right end of the interruption (as viewed in FIG. 1) is a second downward-leftward slanted groove 56 which extends to the bottom of the skirt at a point to the right of the end of groove 50. Preferably bead 44 is interrupted where grooves 50 and 56 cross same. Intermediate the ends of grooves 50 and 56 is a second tab 57 shorter than tab 51.

Groove 43 is interrupted between the points at which the grooves 50 and 56 join same. Bead 44 is interrupted where grooves 50 and 56 intersect same but between the points of intersection bead 44 is formed with a short stretch 52 which functions as a reinforcement for tab 57 when the latter is pulled to remove the reclosure cap from the neck.

In the use of the device, after the container 11 has been filled with a product, the cap 12 is installed. Automatic machinery may be used for this purpose but it will suffice to explain a manual installation. The skirt 37 is slipped on outside neck 13 and a downward pressure is applied. As slanted surface 48 guides the lip 14 between skirts 37 and 47 and as downward pressure is continued, the bead 41 slides over the slanted flank 27 and the bead 44 slides over the slanted flank 29 until beads 41 and 44 snap under the flanks 28 and 31, respectively. The flexible nature of the plastic material of which the cap is fabricated, permits this temporary deformation of the parts. Thus assembled, the jar is sealed very tightly since the lip 14 is jammed between skirts 37 and 47 and the skirt 37 fits rather tightly against the outside of neck 13. It is impossible to remove the cap 12 while the skirt 37 is intact. It will be understood that containers of this type are subjected to considerable stress by handling in transportation, but since the beads 41 and 44 are snapped in place under the buttress surfaces which have been described, it is practically impossible to remove the cap.

When the consumer wishes to open the jar, he grips the tab 51 and pulls upwardly along slanted score line 50, then along score line 43, then downwardly along line 56. FIG. 3 shows a partial completion of the opening operation. The tab 51 is pulled all the way around the jar 11 which completely severs the skirt at the level of groove 43 except that tab 57 remains depending from the skirt and the skirt above tab 57 is reinforced by the portion 52 of bead 44 which remains. The portion of cap 12 above the level of groove 43 (or bead 44) comprises a re-closure cap for the jar 11. Such reclosure cap may be pried off by pulling on tab 57. This operation is possible when there is only a single bead 41 in position. When the skirt 37 is intact before it is torn along groove 43, it is impossible to dislodge both the bead 41 and bead 44. The closure portion of the cap 12 may be replaced by pushing downwardly on disk 36. Bead 41 snaps under flanks 28. The closure may be performed as many times as desired.

As shown in FIG. 2, for shipment and storage prior to installation, the caps 12 nest in a stack. Tabs 51 and 57 overlap the outside of the skirt 27 of the next lower most cap, providing a stable stack.

What is claimed is:

1. In combination, a container neck formed with an external, circumferential first upper bead spaced downward from the upper end of said neck and an external, circumferential first lower bead spaced downward from said upper bead, and a cylindrical outer surface below said lower bead, said upper bead being buttress-shaped and having a downward-outward slanted first conical flank and a substantially radial first bottom flank at the lower end of said first conical flank, said lower bead being buttress-shaped and having a downward-outward slanted second conical flank originating at about the level of said first bottom flank and a substantially radial second bottom flank at the lower end of said second conical flank; and a deformable plastic cap formed with a central top disk and a substantially cylindrical, thin-walled outer skirt depending from the periphery of said disk, said outer skirt scored and weakened in a circumferential first groove opposite the lower edge of said first conical flank and also in a slanted second groove joining said first groove and extending down to the bottom edge of said outer skirt, and an integral tab extending below said bottom edge adjacent the lower end of said second groove, an internal circumferential upper second bead of approximately semi-circular cross-section positioned immediately below said first bottom flank, an internal circumferential lower second bead of approximately semi-circular cross-section positioned immediately below said first groove and said second bottom flank; said cap and neck interfitting in

assembled position with the upper edge of said neck tight against the underside of said disk and the inside of said outer skirt fitting tight around the outside of said neck.

2. The combination of claim 1 in which said cap is formed with a short cylindrical inner skirt depending from said disk spaced inward from said outer skirt, the upper end of said neck wedged between said skirts to form a tight seal.

3. The combination of claim 1 in which said outer skirt is weaker in a slanted third groove joining said first groove and extending down to the bottom edge of said outer skirt, said second and third grooves being separated from each other at the points at which they join said first groove and converging toward each other as they proceed down toward said bottom edge but being separated from each other in a gap at said bottom edge, and which further comprises a second integral tab extending below said bottom edge directly below said gap, said first mentioned tab being offset to one side relative to said gap.

4. The combination of claim 3 in which said first groove is interrupted between the points at which said second and third grooves join said first groove, said second bead being formed with short interruptions where said second and third grooves intersect said second bead.

5. A deformable, plastic cap for a container neck formed with an external, circumferential first upper bead spaced downward from the upper end of said neck and an external, circumferential first lower bead spaced downward from said upper bead, and a cylindrical outer surface below said lower bead, said upper bead being buttress-shaped and having a downward-outward slanted first conical flank and a substantially radial first bottom flank at the lower end of said first conical flank, said lower bead being buttress-shaped and having a downward-outward slanted second conical flank originating at about the level of said first bottom flank and a substantially radial second bottom flank at the lower end of said conical flank; said cap having a central top disk and a substantially cylindrical, thin-walled outer skirt depending from the periphery of said disk, said outer skirt scored and weakened in a circumferential first groove opposite the lower edge of said first conical flank and also in a slanted second groove joining said first groove and extending down to the bottom edge of said outer skirt, and an integral tab extending below said bottom edge adjacent to the lower end of said second groove, an internal circumferential upper second bead of approximately semi-circular cross-section positioned immediately below said first bottom flank, an internal circumferential lower second bead of approximately semi-circular cross-section positioned immediately below said first groove and said second bottom flank.

6. A cap according to claim 5 which further comprises a short, cylindrical inner skirt depending from said disk spaced inward from said outer skirt.

7. A cap according to claim 5 in which said outer skirt is weakened in a slanted third groove joining said first groove and extending down to the bottom edge of said outer skirt, said second and third grooves being separated from each other at the points at which they join said first groove and converging toward each other as they proceed down toward said bottom edge but being separated from each other a gap at each bottom edge, and which further comprises a second integral tab extending below said bottom edge directly below said gap, said first mentioned tab being offset to one side relative to said gap.

8. A cap according to claim 6 in which said first groove is interrupted between the points at which said second and third grooves join said first groove, said second bead being formed with short interruptions where said second and third grooves intersect said second bead.

9. A deformable plastic cap for a container neck of the type having external means for gripping said cap, said cap having a central top disk and a substantially cylindrical, thin-walled outer skirt depending from the periphery of said disk, said outer skirt scored and weakened in a circumferential first

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groove intermediate the top and bottom of said skirt, said outer skirt also weakened in a second groove joining said first groove at a first point and slanting downward in a first direction from said first point to the bottom edge of said outer skirt, said outer skirt further weakened in a third groove joining said first groove at a second point spaced from said first point in said first direction, said third groove slanting downward in a second direction from said second point in a second direction opposite said first direction to the bottom edge of said outer skirt, said second and third grooves converging toward each other as they proceed down toward said bottom edge but being separated from each other in a gap, at said bottom edge, said outer skirt having internal means

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adapted to grip said external means of said neck to retain said cap on said neck so long as said first groove is unbroken, said internal means being located partly above and partly below said first groove, a first tab extending below said bottom edge displaced from said second groove in said second direction, and a second tab extending below said bottom edge directly below said gap.

10. A cap according to claim 9 in which said first groove is interrupted between said first and second points and in which said outer skirt is formed with a reinforcement adjacent said first and second points when said second tab is pulled.

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