Sept. 30, 1969 D. D. ACTON 3,469,727

LUG TYPE CLOSURE CAP HAVING TEAR-OFF SKIRT PORTION

Filed Sept. 1, 1967 2 Sheets-Sheet 1

Fig. 1.

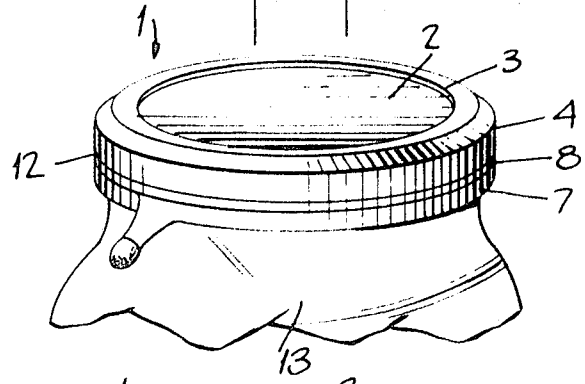

Fig. 2.

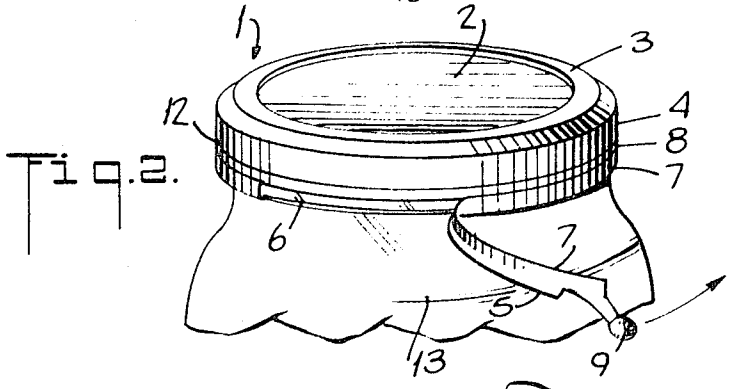

Fig. 7.

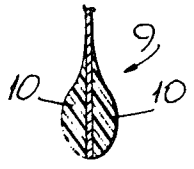

Fig. 3.

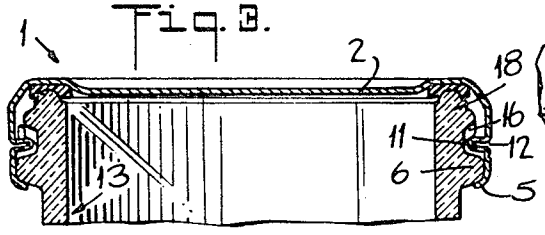

Fig. 4.

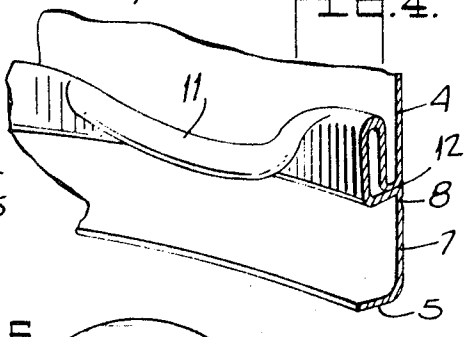

Fig. 5.

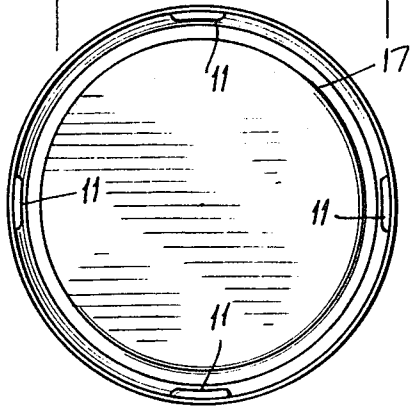

Fig. 6.

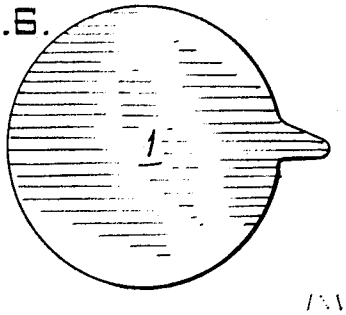

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Fig. 11.

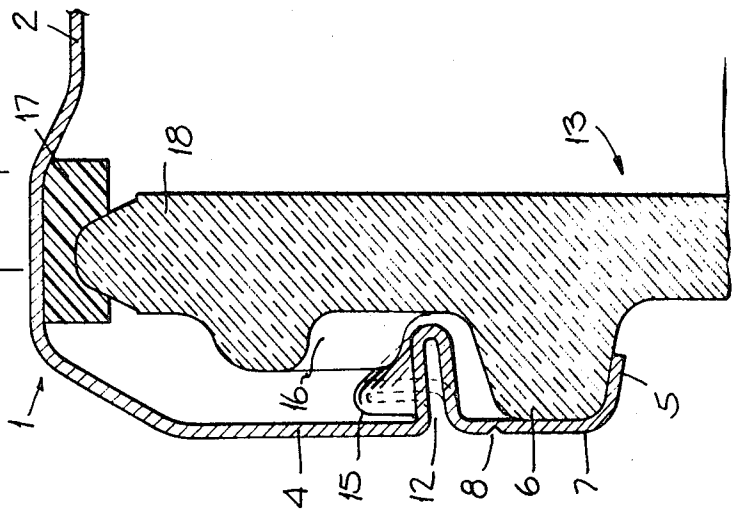


Fig. 10.

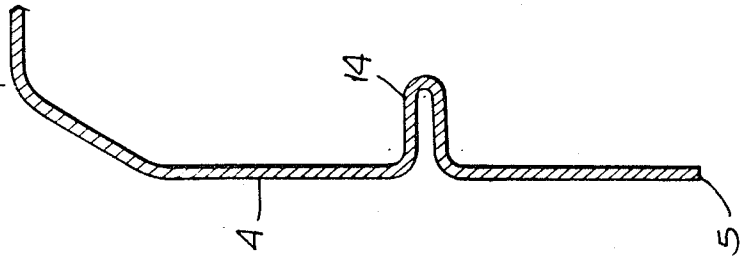


Fig. 9.

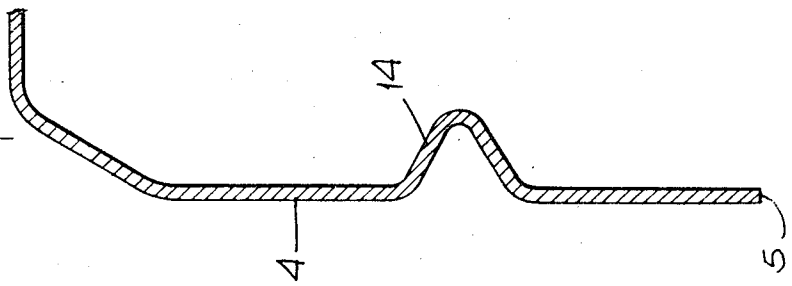
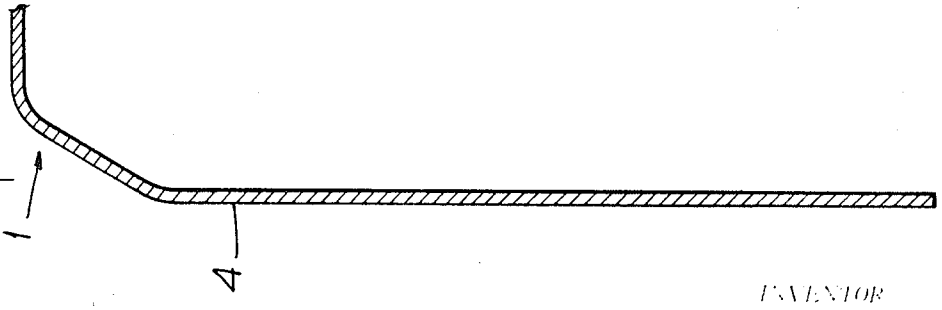


Fig. 8.



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United States Patent Office 3,469,727
Patented Sept. 30, 1969

3,469,727

LUG TYPE CLOSURE CAP HAVING TEAR-OFF SKIRT PORTION

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Filed Sept. 1, 1967, Ser. No. 664,982
Int. Cl. B65d 41/32
U.S. Cl. 215—42 11 Claims

ABSTRACT OF THE DISCLOSURE

A closure cap having an inwardly rolled bead around its skirt in a zone spaced from the lower edge of the skirt, which bead is flattened against the skirt to give a substantially smooth outer skirt surface and has spaced lugs thereon which are hidden inside the skirt. The lower portion of the skirt may be crimped about a bead on the container to be sealed, creating a barrier against contamination and insect infestation between the container finish and closure skirt, and may be used as a tear strip for unsealing the package by forming a score line in the skirt below the lug forming portion. The method of forming the hidden lugs comprises rolling the bead inwardly from the skirt, flattening the bead and holding spaced portions while folding the intermediate portions against the side of the skirt.

Brief summary of invention

The present invention relates ot an improved closure cap and to its method of manufacture and more particularly to an improved hidden lug construction for a closure cap and to a novel method of forming the hidden lug.

The closure cap of the present invention is a metal cap including a resilient gasket as used for sealing glass or other containers. The cap includes inwardly directed lugs adapted to engage cooperating threads formed on the upper portion of the container such as at the finish portion of a molded glass container. In the case of the present closure the new lugs may be used to retain the closure cap on the container at the initial sealing as well as for facilitating the removal and reapplication of the cap by the product user. Where this cap is used for forming a vacuum seal, the improved lugs may not be relied on for providing the initial closure retention as the vacuum forces on the cap will retain it in position independently of the lug. In this case the new lug is useful for breaking the vacuum as the closure is twisted off and may thereafter be used for resealing the container. As will be apparent from the following detailed explanation of the new lug, the lug is also adapted for being positioned in an intermediate portion of the closure cap skirt in any desired position below the cap top and above the lower edge of the skirt. This permits the lug to be positioned well above the lower edge of the skirt permitting initial fastening of the closure cap on the container by a rolled-in or crimping of the lower edge of the cap skirt about a suitable shoulder or bead provided on the container. The spacing of the lug from the lower edge also adapts the cap for use with a rip-tab or a tear-strip to facilitate the removal of the cap where a rolled-in or crimped lower edge is used. It is, therefore, also apparent that a closure cap using this lug is particularly suitable for use on a cap having a tightly sealed and insect-proof cap skirt construction.

The preferred method of forming the new lug structure provides a substantially hidden lug not visible from the outside of the cap, as the method of forming the lug leaves only a thin fold or line visible on the outer surface of the cap skirt. Presently used lugs provided

above the lower edge of the cap skirt either take the form of elongated visible continuous threads or relatively deep indented lugs which both detract from the appearance of the cap and make the application of decorative or labelling material to the cap skirt impractical.

Accordingly, an object of the present invention is to provide an improved lug closure cap.

Another object of the present invention is to provide an improved hidden lug construtcion for closure caps and the like.

Another object of the present invention is to provide a method for forming the hidden lugs in a cap skirt.

Another object of the present invention is to provide an improved hidden lug adapted for being positioned above the lower edge of the cap skirt.

Another object of the present invention is to provide an improved roll-on type of closure cap having hidden lugs to facilitate cap removal and resealing.

Another object of the present invention is to provide an improved insect-proof closure cap capable of being reapplied after being initially removed.

Other and further objects of the present invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

Brief description of the drawings

A preferred emodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a perspective view of the cap in position on a container;

FIG. 2 is a perspective view corresponding to FIG. 1 illustrating the cap removal utilizing a rip-tab;

FIG. 3 is a vertical cross-section of the preferred embodiment of FIG. 1 in position on a container;

FIG. 4 is an enlarged detailed perspective view illustrating a preferred embodiment of closure lugs;

FIG. 5 is a bottom plan view of the cap of FIG. 1;

FIG. 6 is a plan view of a preferred blank for forming the cap shell;

FIG. 7 is a sectional view illustrating a preferred embodiment of the rip-tab;

FIGS. 8 through 11 are enlarged sectional views illustrating the preferred steps in the formation of the preferred lugs with FIG. 11 showing the cap applied to a container.

Detailed description of the invention

The improved hidden lug construction will now be described together with the preferred method of forming the lug. As already indicated, the new lug **11** has the advantage that it may be positioned at a desired place on the cap skirt such as the generally central position **12** illustrated in the drawings, or as desired in a particular cap in a position above or below that illustrated. When positioned as illustrated well above the lower edge **5** of the skirt **4**, this permits a cap to be rolled on to a retaining bead **6** on a container **13** as illustrated and allows a score line **8** to be positioned below the lug **11** to form a tear-strip **7** and a rip-tab **9** for cap removal. It is clear that the new lug **11** may be used with other cap constructions where the cap might be retained after its initial application by the engagement of the cap lugs with the container lugs and where the lower portion of the caps may be differently shaped to include either an inwardly or outwardly rolled wire or other construction.

The cap as illustrated has a cut ring gasket **17** for its sealing member, however, it is clear that a flowed-in or other type of resilient gasket may be used.

FIG. 1 illustrates the preferred embodiment of the cap **1** having a cover **2** with the usual top including a stacking panel **3** and a depending skirt **4** at the outer edge of the cap top. The lower edge **5** of the skirt **4** is rolled or crimped about a mating bead **6** on the glass finish **18** to seal the cap thereon as shown in FIG. 3. The lower portion **7** of the cap **1** is designed to be torn away when opening the sealed package by the provision of a score line **8** around the periphery of the cap **1** somewhat above the lower edge **5**. A rib-tab **9** is provided extending from the lower edge **5** of the skirt **4** which may be gripped by the user and drawn away from the cap to tear off the lower portion **7** of the skirt **4** completely around the cap circumference. This rip-tab **9** is shown in cross-section in FIG. 7 and includes beads of plastic **10** on the opposite surfaces of the metal strip to facilitate gripping.

The preferred lug **11** is formed at about the central portion of the skirt **4** above the score line **8**. As seen in FIG. 1 the improved method of lug formation leaves only a circular line **12** visible around the cap skirt **4** at the position of the inner cap lugs **11**. The method permits a relatively deep lug **11** to be formed well above the cap skirt edge **5** permitting the tear strip **7** to be provided below the lug **11** to anchor the cap **1** onto the container **13** forming a tamper-proof and insect-proof package as shown in FIG. 3.

Method of making the closure

This improved closure cap **1** with the hidden lugs **11** in the cap skirt **4** and the tear strip **7** on its lower edge is formed by the method as follows. Beginning with the blank **1** shown in FIG. 6 the cap is first stamped and drawn to form the usual shell having a cover portion **2** and a depending skirt **4**. The blank skirt **4** shown in section in FIG. 8 then has an inwardly directed bead **14** rolled around its circumference in a zone spaced from the lower edge **5** of the skirt **4** as illustrated in section in FIG. 9. Next a first forming operation flattens the rolled bead **14** into the shape illustrated in section in FIG. 10.

The lugs **11** are now formed in a subsequent forming operation by supporting spaced portions of the flattened bead **14** with lug-shaping fingers while the intermediate portions **15** of the flattened bead are folded against the side of the skirt **4**. The cap **1** may then be sealed on a container **13** by crimping or rolling the lower portion **7** of the cap skirt **4** over a bead **6** provided on the container finish **18** as illustrated in FIG. 11.

This cap **1** may be made tamper-proof in a preferred embodiment by forming a score line **8** above the crimped portion **5** of the skirt **4** to define a tear strip **7**. A pull-tab **9** is formed on this portion **7** of the skirt **4** to enable the user to easily rip the tear strip **7** from the cap **1** to open the container **13**. The cap **1** may be reapplied to the container **13** by twisting the hidden lugs **11** onto suitable threads **16** provided on the upper portion of the container finish **18**. The cooperation of the parts of the cap skirt **4** with the threads **16** and bead **6** on the container finish is best seen in FIG. 11.

A cut ring gasket **17** is shown in FIG. 11 as the sealing means between the cap **1** and container finish **18**. However, any suitable gasket including a flowed-in gasket may be used for providing either a top seal or a top and side seal. In the normal sealing operation the cap **1** is first twisted lightly on and is then pressed downwardly as the skirt edge **5** is rolled down under the container bead **6**. When sealed in this manner, the cap lugs **11** will occupy a position below the container finish lugs **16**. It is also contemplated that the cap lug depth may be minimized so as to permit the cap **1** to be applied by a press-on operation and in this case a minimum number of lugs **11** would be used as, for example, three lugs **11** rather than four as are shown in the bottom view of the finished cap **1** in FIG. 5.

In a preferred method forming the pull tab **9** the metal portion of the pull-tab is dipped into a liquid plastic solution so that a drop-like plastic grip **10** forms when the pull-tab is withdrawn from the plastic. The plastic is then hardened by a curing operation as in the case of a plastisol or other heat hardened plastic or by cooling as in the case of a thermo-plastic.

This dipping operation insures a coating over all of the exposed surfaces of the metal tab portion including the sharp cut edges and also results in particularly useful rounded drop-like shape which facilitates gripping of the pull-tab **9**.

It will thus be seen that an improved closure cap is provided by the present invention having hidden lugs in the cap skirt which may be relatively deep and formed well above the skirt edge so as to permit a tear strip to be provided below the lugs. The tear strip anchors the cap onto the container and forms a tamper-proof and insect-proof barrier after the initial sealing of the container. The hidden lugs permit the cap to be resealed on the container after the tear strip has been removed by the user when initially opening the sealed package. The cap at all times has a substantially smooth outer skirt as the lugs are formed inside leaving only a thin fold or line visible on the outside of the skirt.

As various changes may be made in the form, construction and arrangement of the parts and the method described herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. A metal closure cap comprising the combination of a cover and a depending skirt, an inwardly directed fold in the cap skirt and encircling the cap skirt, said fold being situated in a zone spaced from the lower and upper portions of the skirt, portions of said fold extending inwardly of the cap and forming container engaging lugs, and the portions of the fold intermediate the lug portions being positioned adjacent to the inside of the cap skirt.

2. A closure as claimed in claim **1** in which a weakened line is formed on said skirt below the fold permitting the lower portion of the skirt to be torn off.

3. A closure as claimed in claim **1** in which a score line is formed on said skirt below the fold permitting the lower portion of the skirt to be torn off.

4. A closure as claimed in claim **1** which further comprises a rip tab on the lower portion of said skirt.

5. A closure as claimed in claim **1** which further comprises a rip tab having plastic grip.

6. A closure as claimed in claim **4** in which the rip tab comprises a dipped and hardened plastic grip.

7. A sealed package including a metal closure cap comprising the combination of a cover and a depending skirt, an inwardly directed fold in the cap skirt and encircling the cap skirt, said fold being situated in a zone spaced from the lower and upper portions of the skirt, portions of said fold extending inwardly of the cap forming container engaging lugs, and a container comprising means adjacent its rim for engaging said cap lugs and having a cap engaging shoulder below said engaging means for forming a barrier with the lower portion of the cap skirt.

8. A sealed package as claimed in claim **7** in which a score line is formed on said skirt below the fold permitting the lower portion of the skirt to be torn off.

9. A sealed package as claimed in claim **7** in which the package comprises a rip tab on said skirt.

10. A sealed package as claimed in claim **7** which further comprises a rip tab having a plastic grip.

11. A sealed package as claimed in claim 7 in which a weakened line is formed on the skirt of the cap below the fold permitting the lower portion of the skirt to be torn off.

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GEORGE T. HALL, Primary Examiner

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