Jan. 1, 1963 G. J. FOSS ETAL 3,071,275

CLOSURE CAP AND METHOD OF MAKING SAME

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Fig. 1.

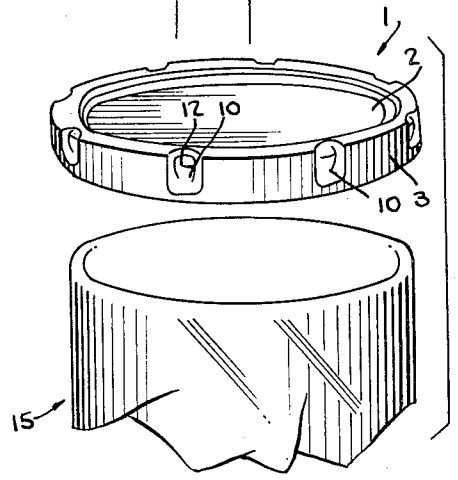
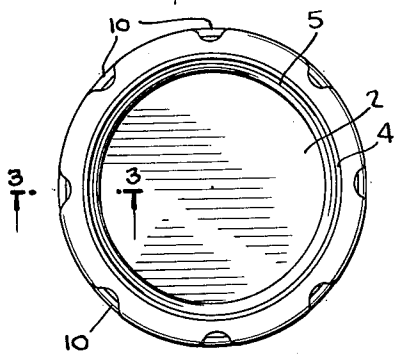


Fig. 2.



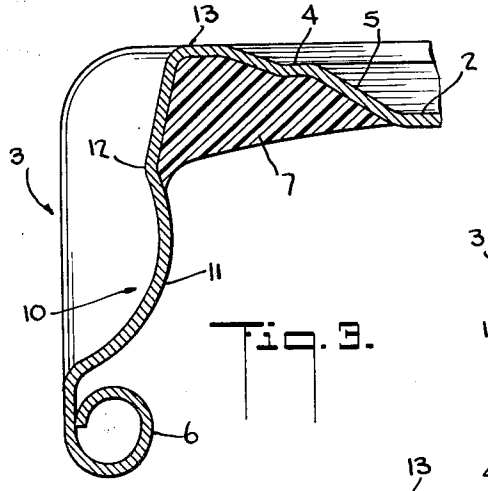


Fig. 3.

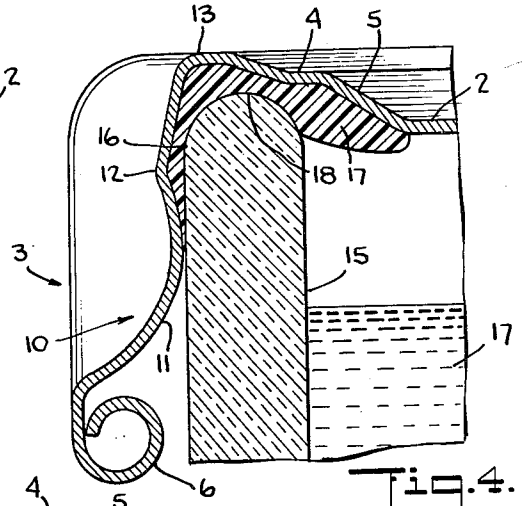


Fig. 4.

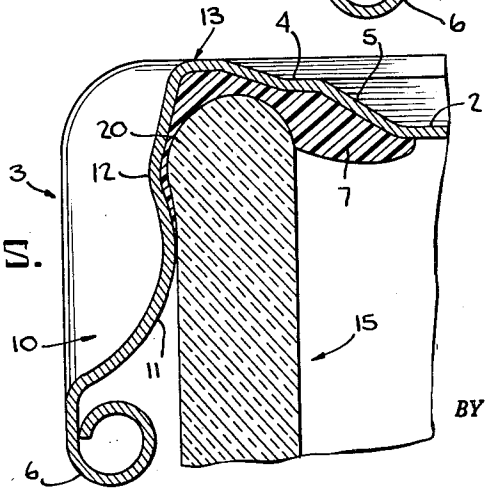


Fig. 5.

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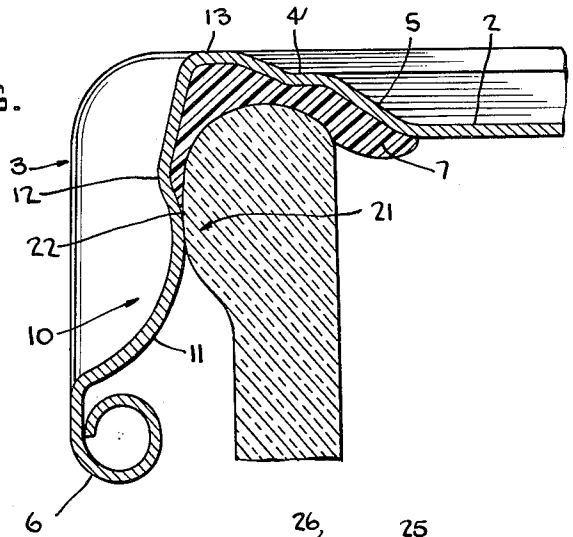
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Fig. 8.



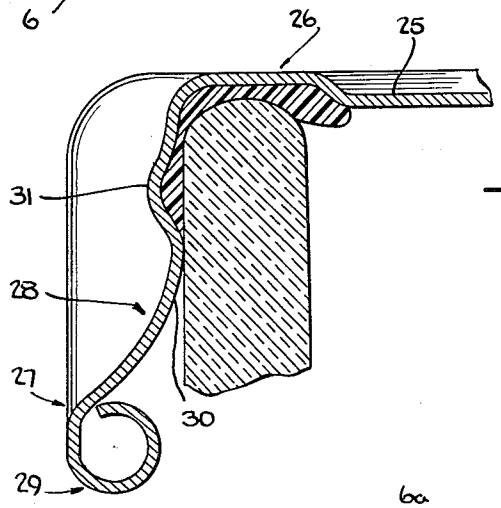


Fig. 10.

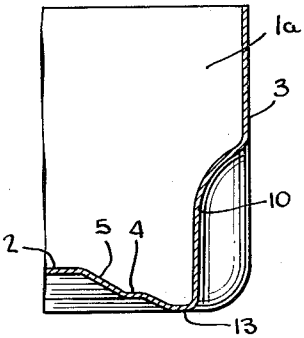


Fig. 7

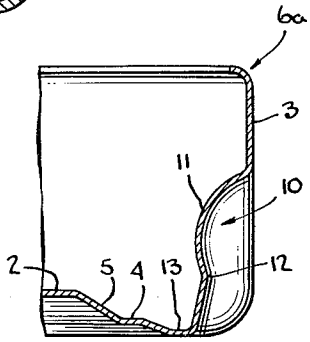
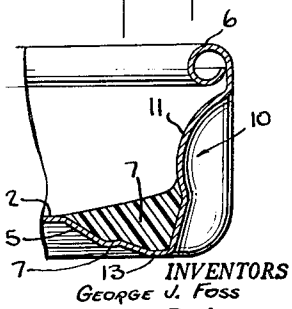


Fig. 6.

Fig. 9.



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CLOSURE CAP AND METHOD OF MAKING SAME

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2 Claims. (Cl. 215—40)

The present invention relates to a closure cap and more particularly to an improved closure cap of the "press-down" type which is adapted to be applied to containers by forcing it down over the mouth of the container.

At the present time, closure caps of the press-down type are being widely used for many products. However, it has been found that the housewife has difficulty in removing the closure cap from the container and that such closure caps are often bent or cracked during removal so that they cannot be reapplied to the container. If the closure caps are not bent, the housewife has difficulty in re-applying the cap.

Another disadvantage of such closure caps in present use has been the fact that the closure cap does not grip the sides of the container with sufficient pressure to maintain the cap on the container, especially when such caps are used in connection with containers having a straight-wall finish.

Another drawback of such closure caps is that they fit only a particular type of container and do not ordinarily fit other types of containers. Thus, a press-down closure cap adapted to fit a container having a straight-wall finish cannot ordinarily be used on a container with a beaded finish and vice versa. Hence, a packer who uses containers having different finishes must stock different types of closure caps and must take care that a particular cap is not used on the wrong container.

The present invention overcomes these defects and has for one of its objects the provision of an improved press-down closure cap which can be easily removed by the housewife without bending or cracking and which can be easily re-applied.

Another object of the present invention is the provision of an improved closure cap of the press-down type which will have a greater holding power so as to permit it to remain seated on the container.

Another object of the present invention is the provision of an improved closure cap of the press-down type which is adapted to fit a variety of containers regardless of whether they have straight-walled or beaded finishes.

Another object of the present invention is to provide an improved method of making a closure cap of the press-down type.

Other and further objects of the 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.

A preferred embodiment 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 an exploded perspective view showing the closure cap of the present invention in position to be applied onto a container;

FIG. 2 is a top plan view of the closure cap of the present invention;

FIG. 3 is a sectional view taken along line 3—3 of FIG. 2 showing the construction of a closure retaining lug;

FIG. 4 is a sectional view similar to FIG. 3 showing the position of the closure cap when applied to a container having a straight-wall finish;

FIG. 5 is a sectional view similar to FIG. 4 showing the position of the closure cap when applied to a container having one type of beaded finish;

FIG. 6 is a sectional view similar to FIG. 4 showing the position of the cap when applied to a container having a different type of beaded finish;

FIG. 7 is a sectional view showing the first step in the method of making the closure;

FIG. 8 is a sectional view showing the second step in the method;

FIG. 9 is a sectional view showing the last steps in the method; and

FIG. 10 is a sectional view showing a modification of the cap of the present invention.

Referring more particularly to the drawings and to FIGS. 1, 2 and 3, the closure cap 1 of the present invention is comprised of a cover portion 2 and a skirt portion 3 depending therefrom. The cover portion has a gasket-receiving channel 4 formed by a shoulder 5 and is adapted to receive a gasket 7 as shown in FIG. 3. The edge of the skirt 3 is curled inwardly to form a bead 6 to improve the appearance of the closure cap, to strengthen the cap and to conceal the raw edge of the skirt which contributes to the elimination of corrosion. The closure cap is made of sheet metal and preferably is provided with lacquer coating (not shown) to prevent rusting.

A gasket 7 is inserted into the gasket-receiving channel 4. For convenience, the gasket shown in FIG. 3 of the drawings is a so-called "flowed-in" type gasket, i.e., a gasket in which a gasket-forming compound, which may be a thermoplastic material, is flowed into the gasket-receiving channel and heat is applied to cure it. However, it will be understood, that it is within the scope of the present invention to use a "cut ring" type gasket or any other suitable gasket.

At spaced intervals the skirt 3 is indented to form a plurality of spaced closure retaining lugs 10. The lugs 10 have a concave gripping portion 11 to give resiliency to the lugs 10 and permit them to grip the container finish firmly. An outwardly directed knob 12 located in each lug 10 above the concave gripping portion 11 provides a recess for gasket material. The gasket material in the recess of the knob 12 prevents the container from contacting the closure cap and thereby preventing the closure cap from mushrooming or pumping off.

The gasket-receiving channel 4 has an upwardly directed peripheral rib or channel bead 13 which is adapted to prevent gasket cut through and loss of adhesion of the sealing gasket compound at the lug area. The rib 13 provides a place for the softened sealing gasket compound to flow when the closure cap is initially applied to the container.

As shown in FIGS. 1 and 4, the closure cap 1 is adapted to be mounted on a container 15, which is shown as having a straight-wall finish 16. The lugs 10 bear against the sides of the container finish 16 to hold the cap in place. It will also be noted that the skirt is of sufficient depth to hide the level line of the product 17. The closure cap 1 is applied to the container by downward pressure and is held in place by the lugs 10. The gasket 7 cooperates with the rim 18 of the container and is compressed to form a seal by the impression of the glass sealing surface into the previously heat softened thermoplastic material of the sealing gasket 7. The gasket material in the knob 12 in the lugs 10 prevents the contact between the top of the container finish and the closure cap. When it is desired to remove the cap, the cap is lifted by applying upward pressure beneath the curled bead 6 at the edge of the skirt. Since the lugs are flexible, the closure cap will move upwardly without bending or cracking. After use, the closure cap may easily be re-applied by the housewife by simply pressing it down-

ward on the container and the cap will be held in place by concave portions **11** of lugs **10**.

In FIG. 5, the closure cap is shown as applied to a container having a cylindrical beaded finish **20**. It will be noted that in using the closure cap with this type of beaded finish **20**, the concave portion **11** of the lugs **10** abuts the container finish below the beaded finish **20** and that the knob **12** is approximately opposite the beaded finish **20**. With this arrangement the beaded finish **20** prevents the closure cap from moving upwardly but will not prevent the lugs **10** from being flexed thereover to permit removal without bending the cap.

FIG. 6 shows the application of the closure cap of the present invention to a container which has a modified form of bead **21** which has an extended sealing surface **22**. It will be noted that the lugs **10** bear against the sealing surface **22** of the bead **21** to apply pressure thereto and prevent the cap from coming off.

It will be noted that the closure cap of the present invention, as shown in FIGS. 1 through 6, is adapted to be applied to the container having a straight-walled finish **16** as shown in FIG. 4, the container having cylindrical beaded finish **20** as shown in FIG. 5, or the container having the elongated beaded finish **21** as shown in FIG. 6. Hence, the packer can order one type of cap and apply this cap to whatever type of container he is using so as to eliminate the necessity of stocking different types of caps for different types of containers.

FIGS. 7 to 9 illustrate the improved method of making the cap shown in FIGS. 1 to 6. Referring to FIG. 7, a closure shell **1***a* is first stamped from a sheet of metal by a suitable die (not shown). It will be noted that in the first stamping step, as shown in FIG. 7, the lugs **10** and the peripheral rib **13** are formed simultaneously by the die. Thereafter, the closure shell **1***a* is then placed in a rolling mechanism (not shown) which will coax the edge **6***a* of the skirt inwardly, as shown in FIGS. 8, and which will form the knobs **12** in the lugs **12**.

As shown in FIG. 9, the edge of the skirt is then curled into a bead **6** and thereafter the gasket **7** is applied to the closure shell to complete the closure.

FIG. 10 shows a modification of the closure cap with the present invention. The closure cap is provided with a cover portion **25** having a gasket receiving channel **26** and skirt portion **27** having locking lugs **28**. The skirt portion **27** has an inwardly curled bead **29** on the bottom and each locking lug **28** has a concave pressure applying portion **30** and a knob **31** similar to the knob **12** shown in FIGS. 1 to 5. The closure cap shown in FIG. 7 may be used when there is no danger of the container cutting the gasket and hence does not have a peripheral rib similar to rib **13** in the closure cap shown in FIGS. 1 to 6.

It will be understood, of course, that while the closure cap of FIG. 10 is shown as being applied to a container having a straight-walled finish, and it will be understood that these caps may also be used with either of the beaded finish containers shown in FIGS. 5 and 6.

It will be seen that the present invention provides an improved closure cap of the press-down type which will permit a housewife to easily remove the closure cap without bending or cracking it, which will have a greater holding power to form a secure seal with the container, which is adaptable to fit a variety of container finishes, regardless of whether they are straight-walled or beaded. The present invention also provides an improved method of making such a closure cap.

As various changes may be made in the form, construction and arrangement of the parts 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 our invention, we claim:

1. A closure cap comprising a cover portion, a substantially straight-walled skirt portion depending from said cover portion, a plurality of spaced, inwardly directed lugs on said skirt portion, each of said lugs being substantially normal to the cover portion and extending downwardly from the top edge of said skirt and terminating short of the bottom edge of the skirt, each of said lugs comprising an inwardly directed concave portion adapted to apply pressure to a container finish and hold the cap thereon, each of said concave portions being on substantially the same horizontal plane, and an outwardly directed knob in each of said lugs adapted to act as a recess for gasket material.

2. A closure cap as claimed in claim 1, wherein an upwardly directed rib is provided at the juncture between the skirt portion and the cover portion, to prevent the gasket from cutting through.

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