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CLOSURE CAP, CONTAINER AND SEALED PACKAGE THEREFOR

Filed Aug. 22, 1961

2 Sheets-Sheet 1

Fig. 1.

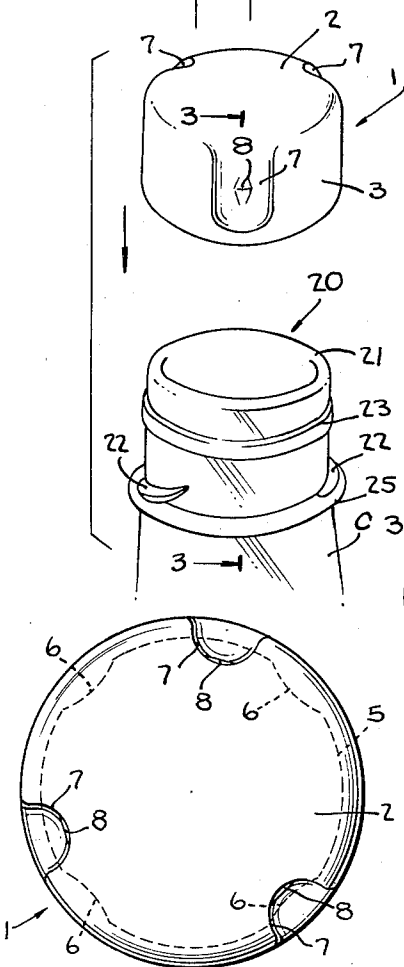


Fig. 2.

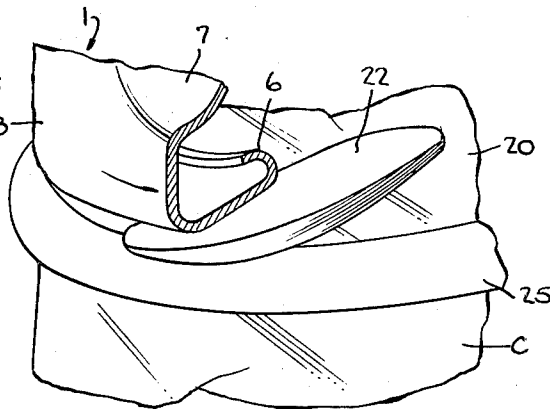
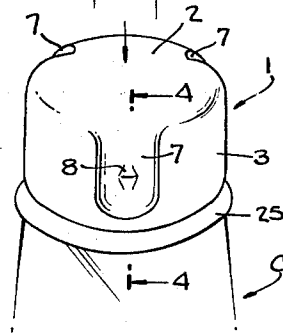


Fig. 4.

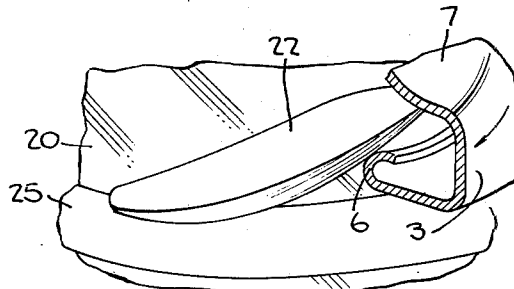


Fig. 5.

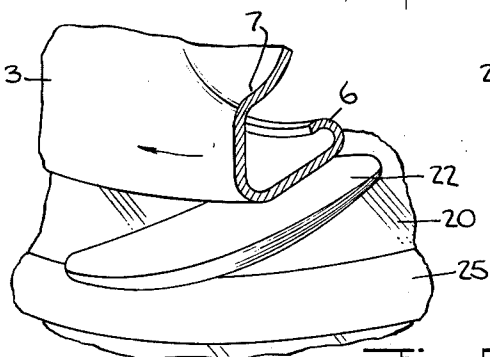


Fig. 6.

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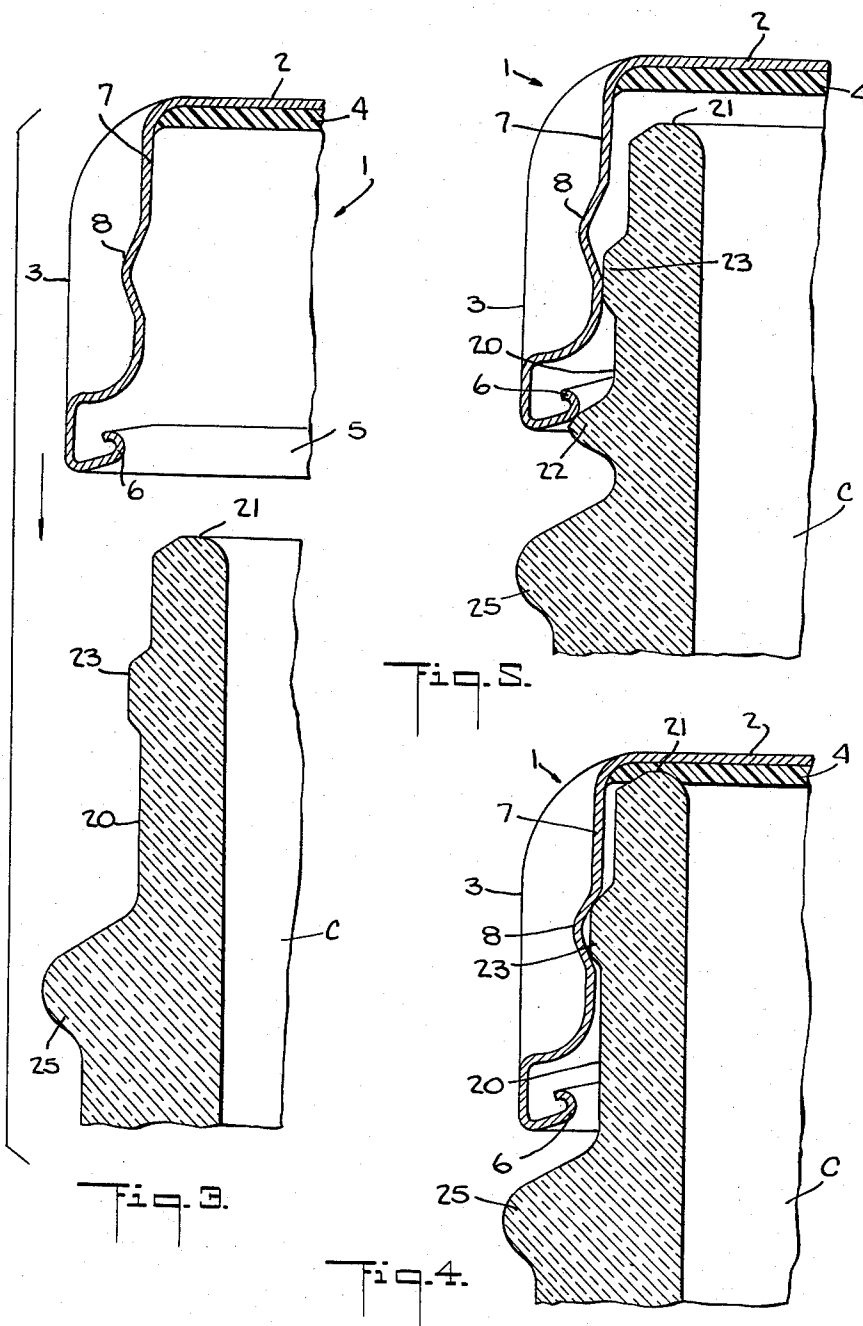
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CLOSURE CAP, CONTAINER AND SEALED PACKAGE THEREFOR

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2 Sheets-Sheet 2



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1

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CLOSURE CAP, CONTAINER AND SEALED PACKAGE THEREFOR

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The present invention relates to the sealing art and more particularly to a hermetically sealed package, a closure cap therefor and a container to be used therewith.

In the prior art, closure caps of the so-called "twist" type are initially applied to a container by a machine which applies a torque to the closure caps to rotate or twist the closure caps during application. However, it has been found that the application of such a torque is sometimes difficult in small diameter caps, such as ketchup caps.

The present invention has for one of its objects the provision of an improved sealed package in which the closure cap need not be twisted or rotated for initial application to a container but may be pressed on the container.

Another object of the present invention is the provision of an improved closure cap which is adapted to form an improved seal with the container to form a hermetically sealed package.

Another object of the present invention is the provision of an improved closure cap which can be initially applied to the container by a press-on operation and thereafter screwed off when it is to be removed.

Another object of the present invention is the provision of an improved closure cap which may be easily manufactured in mass production.

Another object of the present invention is the provision of an improved container adapted to cooperate with the closure to form a hermetically sealed package.

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 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 an exploded perspective view of a closure cap and the container with which it cooperates made in accordance with the present invention before the cap is applied to the container;

FIG. 2 is a perspective view showing the closure cap applied to the container to form a sealed package;

FIG. 3 is a sectional view taken along line 3-3 of FIG. 1;

FIG. 4 is a sectional view taken along line 4-4 of FIG. 2;

FIG. 5 is a sectional view showing the position of the lugs of the closure cap relative to the camming surfaces of the container under certain circumstances;

FIG. 6 is a perspective view showing the action of the closure cap when it is positioned as shown in FIG. 5;

FIG. 7 is a top plan view of the closure cap of the present invention;

FIG. 8 is a fragmentary perspective view showing the camming action of the container threads when the cap is to be removed; and

FIG. 9 is a perspective view showing the manner of

2

re-applying the closure cap to the container after the package has been initially opened.

Referring more particularly to the drawings, the present invention comprises a closure cap 1 adapted to be applied to the container finish 20 of a container C to form a sealed package.

The container finish 20 comprises a sealing surface 21 at the rim of the container adapted to cooperate with a sealing gasket in the closure cap to form a hermetic seal as is usual in such structures.

A pair of angled thread segments or camming surfaces 22 are provided on the finish 20 and are adapted to cooperate with the locking lugs of the closure cap to permit the cap to be cammed up or lifted when it is to be removed. Preferably the camming surfaces 22 form a steep helix angle with the finish for a purpose which will be more fully discussed hereinafter. The usual transfer bead 25 underlies the camming surfaces 22.

A cap holding bead 23 extends around the periphery of the finish 20 above the camming surfaces 22 in order to hold the closure cap in place after the initial sealing operation. While the drawings show the holding bead 23 to being an uninterrupted ring it will be understood that the holding bead may be a series of interrupted coextensive segments, if desired.

The closure cap 1 of the present invention comprises a cover portion 2 and a depending skirt portion 3. The inner and outer surfaces of the closure cap may be covered with a suitable lacquer (not shown) to prevent corrosion and to give the closure cap 1 a pleasing appearance.

The inside of the portion 2 is provided with the usual sealing gasket 4, as shown in the drawings, covering the entire inner surface of the cover portion 2 of the cap. It will be understood, of course, that the gasket 4 may be a "ring" type gasket which covers an outer peripheral zone of the inside of the cover portion. The sealing gasket 4 as shown in the drawing is a so-called "flowed-in" type gasket, in which the gasket material is flowed into the cap and in a semi-plastic state and is permitted to harden. However, a "liner" type gasket which is inserted as a whole may also be used, if desired.

The lower edge of the skirt portion 3 of the cap is rolled inwardly to form a bead 5 and portions of the bead 5 are struck inwardly to form locking lugs 6 which cooperate with the camming surfaces 22 on the container finish to hold the cap on the container when the cap is to be replaced after being initially opened. While four locking lugs 6 are shown in the drawings, it will be understood that any number of lugs may be used, as may be desired.

The skirt portion 3 of the closure cap is provided with a plurality of vertically directed indentations 7 provided with re-entrant holding knobs 8 which are adapted to cooperate with the holding bead 23 on the container finish to aid in holding the closure cap in place after the package has been initially sealed.

With this structure, when the cap is initially applied to the container, air is evacuated from the container to form a vacuum and the closure cap is pressed on to the container finish as shown in FIGS. 1 and 3.

The cap and container are preferably so positioned relative to each other that locking lugs 6 of the cap will move between the camming surfaces 22 of the finish so that the closure cap descends until the sealing gasket 4 strikes the sealing surface 21 of the container. At this point the re-entrant knobs 8 snap on to the holding bead 23 of the container so that the two will cooperate with each other to frictionally help to hold the cap in place until it is to be removed. The cap will be held in place on the container by the combined effects of the atmospheric pressure from the outside and the cooperation of the knobs 8 with the holding bead 23.

3

If during the initial application of the closure cap the container is so positioned relative to the cap that the locking lugs 6 overlie the camming surfaces 22 of the container finish, as shown in FIGS. 5 and 6, the downward pressure on the cap will permit the locking lugs to ride down on the camming surfaces 22 which have a steep helix angle. This will result in the closure cap twisting in the direction of the arrow (FIG. 6) until it is fully seated on the container to form a hermetic seal.

When the closure cap is to be removed, it is twisted in the direction of the arrow, as shown in FIG. 8, until the locking lugs 6 strike the camming surfaces 22 at which point the cap is lifted, the vacuum is broken and the cap may be removed. The action of the camming surface 22 on the locking lugs 6 is sufficient to overcome the frictional force of the annular holding bead 23 on the knobs 8 in the indentations 7 to permit the cap to be removed.

When the cap is to be re-applied it is twisted by the user in the opposite direction as shown in FIG. 9 until the locking lugs 6 slide under the camming surfaces 22 to hold the cap in place.

The indentations 7 will provide a gripping point to permit the cap to be grasped by the user during the removal and resealing operation.

It will be seen that the present invention provides a sealed package in which the cap need not be twisted during its initial application but which may be easily removed by turning. The present invention also provides an improved closure cap and container adapted to cooperate together to form a sealed package.

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 and a skirt portion, means in said closure cap for effecting a seal with a container, locking lugs extending inwardly from the lower edge of said skirt portion, a plurality of spaced holding indentations extending inwardly from said skirt portion adapted to cooperate with the container to hold the cap in place, said indentations extending from

4

the cover portion substantially normal thereto and terminating short of the lower edge of the skirt portion.

2. A closure cap as claimed in claim 1, wherein said indentations have re-entrant holding knobs, each of the holding knobs being on substantially the same elevational plane.

3. A container comprising a finish having a sealing surface, a plurality of spaced camming surfaces in said finish, a peripheral bead extending outwardly from said finish, said bead being spaced above said camming surfaces and spaced below the sealing surface for holding a cap in place after initial sealing.

4. A container as claimed in claim 3, wherein said camming surfaces are at a steep helix angle.

5. A sealed package comprising a closure cap having a cover portion and a skirt portion, sealing means in said closure cap, locking lugs extending inwardly from the lower edge of said skirt portion, a plurality of spaced holding indentations in said skirt portion extending inwardly therefrom, said indentations extending from the cover portion substantially normal thereto and terminating short of the lower edge of the skirt portion, and a container having a sealing surface adapted to cooperate with the sealing means on the closure cap, said container having a peripheral bead extending outwardly from said finish and located below the sealing surface adapted to cooperate with said indentations in the cap to hold the cap in place.

6. A sealed package as claimed in claim 5, wherein said indentations have re-entrant holding knobs on substantially the same elevational plane adapted to cooperate with said peripheral bead in the container.

7. A sealed package as claimed in claim 6, wherein said container is provided with a plurality of spaced camming surfaces spaced below said peripheral bead.

8. A sealed package as claimed in claim 7, wherein said camming surfaces are at a steep helix angle.

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