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3,080,090

CONTAINER

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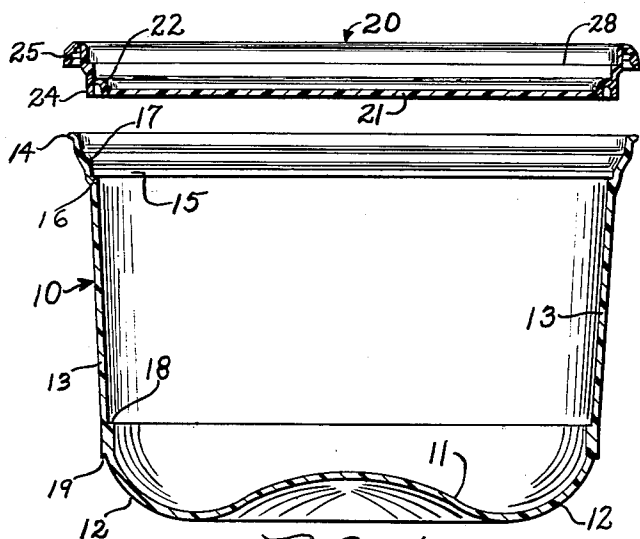


FIG 1

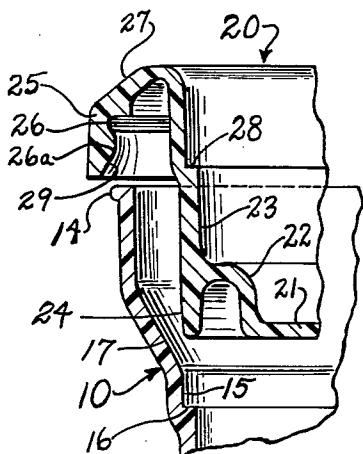


FIG 2

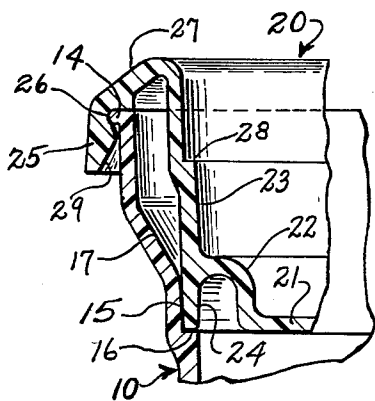


FIG 3

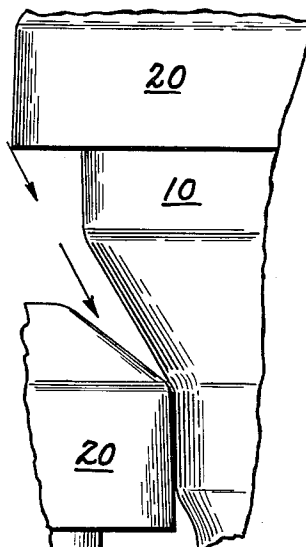


FIG 4

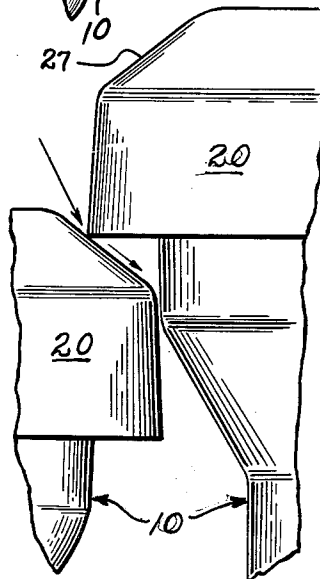


FIG 5

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3,080,090
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This invention relates to plastic container and closure cap assemblies which will produce a consistently positive hermetic seal.

Accordingly, it is an object of my invention to provide a container and closure cap which will produce a consistently positive hermetic seal, and yet will afford easy removal of the closure cap from the container without the use of utensils or tools.

Another object of this invention is to provide a container and closure cap having a novel form of independent sealing and cap retention means.

A further object of my invention is to provide a container and closure cap which, independently of each other, accurately nest for ease in stacking and in automatic feeding from a stack to container closing apparatus.

A still further object of this invention is to provide a container and closure which are so contoured externally that when assembled they will not interlock with and tend to uncup like assembled containers and closures.

The specific nature of this invention, as well as other objects and advantages thereof, will become apparent to those skilled in the art from the following detailed description taken in conjunction with the annexed sheet of drawings, on which, by way of example only, the preferred embodiment of this invention is illustrated.

In the drawings:

FIG. 1 is a vertical cross-sectional view of a container and closure incorporating my invention with the closure spaced axially from the container;

FIG. 2 is an enlarged fragmentary vertical sectional view of a container and closure preparatory to assembly;

FIG. 3 is an enlarged fragmentary vertical sectional view of a container and closure assembled.

FIG. 4 is an enlarged fragmentary view of two assembled containers, incorporating my invention, in abutting relationship; and

FIG. 5 is a view similar to FIG. 4 showing two containers in abutting relationship.

The container 10 may, as shown, be tub-shaped and provided with a circular bottom panel 11 having an upwardly curved shoulder portion 12 at its outer peripheral edge. Extending upwardly from the upper margin of said shoulder portion 12 is an annular side wall 13 which may be flared outwardly in an upward direction. The extreme upper end portion of the side wall is flared in steps and terminates in an external annular retaining bead 14 which in part defines the open dispensing end or mouth of the container. A continuous annular side sealing surface 15 is formed interiorly of the side wall and is spaced downwardly from the annular retaining bead 14 being substantially at the juncture of the side wall 13 and the flared upper end. A radially inwardly directed shoulder or internal ledge 16 is formed at the lower end of the side sealing surface 15. This internal ledge 16 provides a positive stop which in part restricts inward movement of a closure cap 20 during assembly.

The side sealing surface 15 is diametrically smaller than the retaining bead 14 and that portion of the side wall extending upwardly from the side sealing surface 15 is flared outwardly to a greater degree than the remainder of the side wall, thereby forming an annular guiding surface 17 for the sealing lip of the closure 20, which will be described hereafter. Adjacent the lower end of the side wall are formed two annular ledges or

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shoulders 18 and 19, located interiorly and exteriorly, respectively, on and spaced apart axially of the side wall. In stacked or nested containers, these shoulders 18 and 19 will engage each other and provide a positive stop thereby preventing adjacent containers from wedging together.

The closure 20, which is preferably formed of a resilient plastic or thermoplastic material, such as polyethylene, comprises, a central panel or cover portion 21 which is generally circular, a generally vertical annular skirt 23 which surrounds the central panel, and an annular web 22 which connects the skirt and the central panel. The web 22, which is generally inverted L-shaped in cross-section, is connected along its inner lower edge to the margin of the central panel 21, and is connected at its outer or upper edge to the annular skirt at a point spaced vertically upwardly or axially outward from the lower end of the skirt. The lower portion of the skirt, which is thus freely dependent, forms an annular depending sealing lip 24, which is sized to have an interference or friction fit with the internal side sealing surface 15 formed on the container 10. Being resilient and independent of the central panel, it may also flex radially. An annular internal ledge 28 is formed on the side wall of the skirt, above the central panel 21, and serves to support the lower end of a closure when a plurality of such closures are stacked or nested.

The upper end of the skirt 23 is turned radially outwardly and downwardly to form a generally cylindrical lip or extension 25 which is provided internally with an annular channel or groove 26, which is adapted to receive the retaining bead 14 and thereby lock the container and cap together. This channel or groove 26 is, in part, formed by a surface of a locking rib 26a which is engageable with the lower side of the bead 14 on the container. An inclined portion 29 is provided beneath the locking rib to guide it past the bead. Additionally, the extension 25 has a sloped surface 27 which, as shown in FIGS. 4 and 5, aids in preventing the interlocking of assembled containers. The decapping of the containers is also prevented. The axial distance between the channel 26 and the lower end of the sealing lip 24 is approximately equal to the distance between the retaining bead 14 and the internal ledge 16 formed at the base of the internal sealing surface 15 for obvious reasons.

In assembling, the closure 20 is placed on the container 10 with the annular skirt 23 depending downwardly into the container. On downward movement of the closure 20 the sealing lip 24, which is guided into position by the guiding surface 17, comes into sealing engagement with the internal side sealing surface 15. When this initial sealing engagement occurs, the channel 26 and retaining bead 14 are not yet in engagement, thereby permitting the maximum amount of air to be displaced from the container and the minimum amount of air to be trapped when the container and closure are assembled. Continued depression of the closure 20 snaps the channel 26 into engagement with the retaining bead 14 and brings the lower end of the sealing lip to a stop against the internal ledge 16. Since the sealing lip 15 is free and independent of the central panel 21, it is not affected by any contraction or shrinkage of the central panel which may occur during manufacture, thereby providing better control of its diametrical size. Also, since the sealing lip is independent of the central panel, it is flexible and will tolerate a greater interference fit with the internal sealing surface 15 without creating excessive stresses in the container or closure or require excessive application or removal force. Thus, on removal of the closure the lip is free to deform thereby allowing easy removal of the closure and preventing

undue stresses which otherwise might permanently deform the closure and prevent subsequent reuse.

Prior to assembly, the containers and closure may individually be nested or stacked. Positive stacking or nesting of the containers is provided by the annular shoulders or ledges 18 and 19. These shoulders allow containers, of the disclosed construction, to be used with automatic feeding equipment where containers are fed from a nested stack by means of helical cams or stripping levers mounted on automatic packaging machines. The shoulder 28 formed on the inner surface of the annular skirt 23 provides a positive resting place for the lower edge of the sealing lip 24 when a plurality of closures 20 is stacked or nested. This provides positive protection of the sealing lip from damage during shipping or handling, and also allows the closures to be automatically fed from a nested stack by use of conventional means.

It will, of course, be understood that various details of construction may be modified through a wide range without departing from the principles of this invention, and it is not, therefore, the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim:

1. In combination, a container and closure cap therefor formed of a plastic material, the container comprising a bottom, a generally cylindrical side wall rising from the margin of said bottom, said wall being enlarged diametrically at its upper end to provide a mouth opening, said enlarged portion including a generally cylinder-like wall immediately adjacent and defining the opening, a downwardly inwardly inclined wall section at the lower margin of said cylinder-like wall, a second cylinder-like wall section connecting the inclined wall section and the container side wall, the second cylinder-like wall section providing an internal annular side-sealing surface, an abutment at the lower end of the sealing surface to limit axially inward movement of a closure cap into the container, the closure cap comprising a central panel portion of lesser diameter than the internal diameter of said second cylinder-like wall section, an annular collar-like sealing lip frictionally engaging said sealing surface, means formed as an integral part of the panel and lip interconnecting the panel and an upper portion of the lip whereby said lip is free to flex in a generally radial direction and an upstanding annular skirt formed integral with and as an upward extension of the lip and means for separably connecting the skirt and first-named cylinder-like wall.

2. The combination defined in claim 1, the connection

between the skirt of the closure cap and container being a secondary skirt member spaced radially outward from and concentric with the aforementioned skirt, interengaging beads on the container and secondary skirt and means formed as an integral part of and interconnecting the two skirt members.

3. The combination defined in claim 2, the last-named means being a downwardly outwardly declined wall, the upper margin of which merges with the extreme upper end of the skirt.

4. In combination, a container and a closure therefor formed of flexible material, the container comprising a bottom panel, a generally cylindrical side wall rising from the margin of said bottom panel, said side wall being enlarged diametrically at its upper end to provide a mouth opening, a portion of said side wall below said mouth opening being inclined downwardly and inwardly and terminating at the upper end of an annular side sealing surface, a second portion of said side wall defining said annular side sealing surface, means for limiting the axially inward movement of said closure into said container, the closure comprising a central panel portion of lesser diameter than the internal diameter of said annular side sealing surface, an annular collar-like sealing lip frictionally engaging said sealing surface, connecting means formed as an integral part of the panel and lip interconnecting the panel and an upper portion of the lip whereby said lip is freely dependent, an upstanding annular skirt formed integral with and as an upper extension of said lip, and means for separably connecting the skirt and said side wall at the upper end thereof.

5. The combination defined in claim 4, wherein said connecting means comprises a radially extendable link.

6. The combination defined in claim 4, wherein said upstanding annular skirt extends upwardly in spaced relation from said side wall.

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