

[54] CLOSURES FOR CONTAINERS

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[63] Continuation-in-part of Ser. No. 121,461, March 5, 1971, abandoned.

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[51] Int. Cl. B65d 41/28, B65d 51/16

[58] Field of Search 220/42 A, 42 C, 44 A; 215/47, 56, 79; 206/566

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[57] ABSTRACT

The present invention relates to improvements in a closure for the opening in a container, said opening having a rim thereabout. The closure comprises a panel section and a first depending integral flange projecting from the panel section defining a socket adapted to snugly receive the container rim. The improvements include a second flange depending from the panel section, coextensive with the first flange and in an inwardly spaced parallel relation thereto. The flanges define a container rim receiving channel about the closure and include an air release means formed in the flanges to enable release of trapped air as the closure is mounted on the container.

7 Claims, 6 Drawing Figures

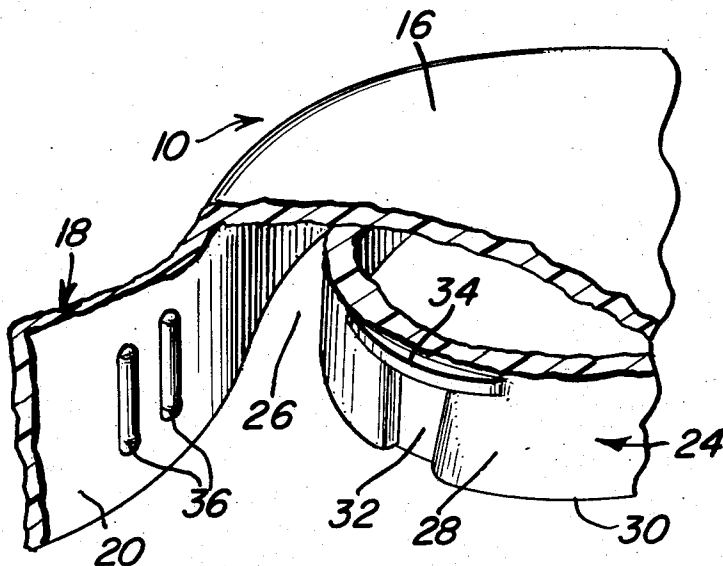


Fig. 1

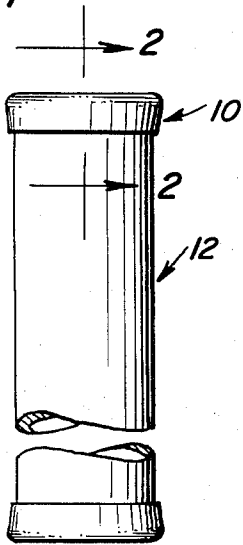


Fig. 2

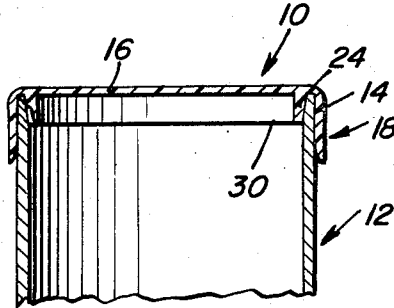


Fig. 3

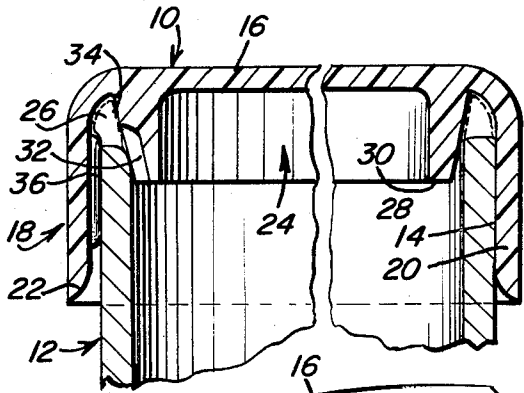


Fig. 4

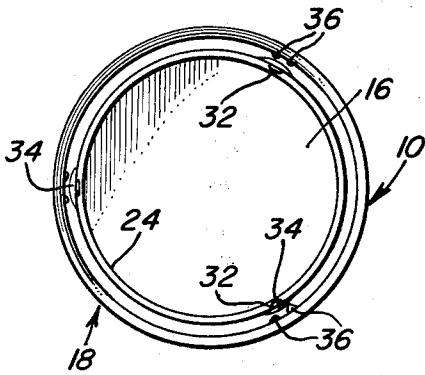


Fig. 5

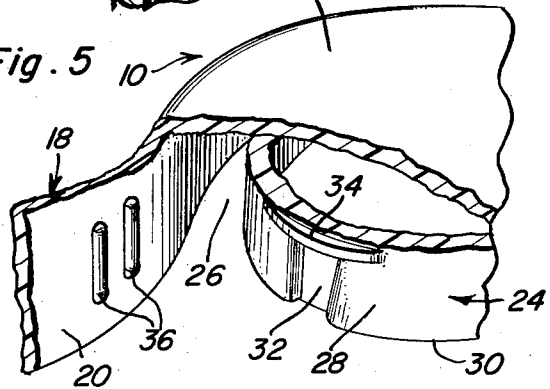
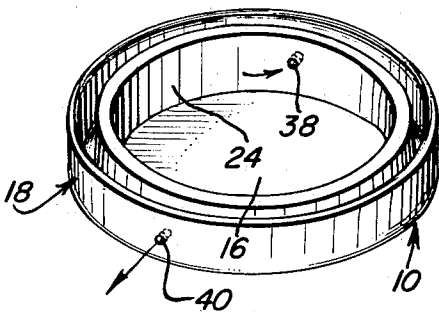


Fig. 6



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CLOSURES FOR CONTAINERS

This application is a continuation-in-part of copending application Ser. No. 121,461 filed Mar. 5, 1971, now abandoned.

BACKGROUND OF THE INVENTION

Various types of closures have been proposed heretofore for containers. Generally, a container has a rim about its opening and the closure comprises a panel, normally flat, with a depending flange portion about the periphery of the panel forming a socket adapted to snugly encompass the rimmed opening. When such closures are pressed over the rim of the container opening a certain amount of air is compressed and trapped in the container. Frequently, such trapped air results in the closure popping back off the container rim.

In the present state of the art an open container (normally having a rim about the opening) is filled with a desired product and a closure or cap is then applied in a high-speed operation by an automatic machine. In such a high-speed operation there is a need for a closure that can be applied without damaging the rim of the container, permit escape of air trapped in the container and not permit leakage of the container contents when the container is stored, for example, in an inverted position.

SUMMARY OF THE INVENTION

The present invention, provides, integrally within a closure structure, means for guiding a container rim into the closure, means for allowing the escape of trapped air within the container, and means for engaging both the inner and outer faces of the rim of the container to rigidify and preserve the shape thereof.

Broadly, the present invention comprises an improvement in a closure for a container opening having a rim about the opening, wherein the closure comprises a panel section and a first depending flange projecting from the panel section defining a socket adapted to snugly receive the container rim. The improvement comprises a second depending flange on the panel section coextensive with the first flange and in inwardly spaced parallel relation thereto, said flanges defining a container rim receiving channel about the closure, and air release means formed in said flanges for enabling a release of trapped air as the closure is mounted.

DESCRIPTION OF THE DRAWINGS

Certain objects and advantages of the present invention will become apparent upon consideration of the following description of the accompanying drawings wherein:

FIG. 1 illustrates a grease cartridge incorporating the closure of the instant invention;

FIG. 2 is an enlarged cross-sectional detail taken on line 2-2 in FIG. 1;

FIG. 3 is a cross-sectional view illustrating the mounting of the closure;

FIG. 4 is a bottom plan view of the closure;

FIG. 5 is a partial perspective view of the closure with portions exploded away for purposes of illustration; and

FIG. 6 is a bottom perspective view of a modified form of closure.

Referring now more specifically to the drawings and FIGS. 1 and 2 in particular, reference numeral 10 is

used to designate the closure of the instant invention. For the purpose of illustration, there is depicted a conventional cylindrical cartridge, designated by reference numeral 12, to which the closure is to be applied subsequent to a filling thereof. The present invention has particularly advantageous use with containers such as, for example, cartridges made of soft materials such as paper, cardboard, plastic and the like.

The closure 10, as opposed to a more conventionally used metal cap, can be formed of an appropriate plastic, such as polyethylene or polypropylene, thus providing a closure which readily can be produced in a variety of colors, will easily accept printing, will not rust and will include an inherent structural stability and resiliency which will preserve and protect the cartridge rim 14.

Generally the closure 10 is to conform to the shape of the opening in a container. When the container is a cylindrical cartridge 12, the closure comprises (FIG. 2) a circular, imperforate panel 16, a first integral depending inner flange 24. Obviously, of course, whether the opening in the container is round, square, rectangular or of other shape, it is essential only that the panel be sufficiently large to cover the opening. However, it may be larger than the opening whereby the overlapping portion of the panel provides a gripping surface to facilitate removal of the closure. It will be readily apparent to those versed in the art that those portions of the panel that will remain exposed, after the closure has been placed on a container, may be of any desired shape. Generally, the panel is formed substantially flat to conserve material and facilitate manufacture of the closure. However, the panel may be in other forms such as, for example, a cone (not shown) such that the converging portion of the cone subsequently may be cut off to form a pouring spout. The panel also may have an inward depression to facilitate stacking containers upon one another.

The inner wall of face 20 of the first flange 18 is substantially perpendicular to the adjoining portion of the panel 16, flaring slightly outward as at 22 at the outer lip of the flange 18.

The second integral depending inner flange 24 is provided in inwardly spaced concentric relation to the outer flange 18 so as to define a cartridge rim confining channel 26 therebetween. As will be appreciated from the drawings, the second flange 24 is substantially shorter than the outer flange 18.

The outer wall or face 28 of the second flange 24 tapers slightly laterally outward toward the outer flange 18 from the free edge 30 thereof to the panel 16. The channel 26 is thus provided with a wide mouth into which the cartridge rim 14 is easily introduced, and a gradually narrowing continuous cross-section which effects a smooth increasing sealing compression on the cartridge rim 14 until the rim 14 seats against the top panel 16.

To insure a proper seating of the closure cap 10, specific provision is made to enable an escape of air from the cartridge 12, thereby avoiding trapped air or the formation of an undesirable air cushion within the cartridge 12. Accordingly, as shown in FIGS. 3 and 4, the outer face 28 of the second flange 24 is provided with at least one, normally three or more, circumferentially spaced vertical grooves or recesses 32 extending transversely of the flange upwardly from the free edge 30 of the second flange 24 for a major portion of the height

of the flange 24 to a point spaced from the overlying panel 16. Between the inner end of each recess 32 and the panel 16, the outer face 28 of the second flange 24 includes a slight outwardly convex projection 34 extending transversely across the recess 32.

Directly opposed from each recess 32, the inner face 20 of the first flange 18 is provided with a pair of laterally spaced parallel ribs 36. The ribs 36 are generally aligned with the opposed edges of the associated recess 32 and extend from the inner end of the recess 32 to a point substantially outward of the second flange 24. These spaced ribs 36 tend to slightly inwardly compress the adjacent wall of the cartridge 12 and define an air passage therealong, which is a continuation of the air passage formed along the inner wall of the cartridge 12 by the aligned recess 32, as the cartridge rim 14 moves inwardly into the gradually converging channel 26. In this manner, an exhausting of trapped air is conveniently effected throughout a major portion of the mounting movement of the closure 10.

The final seating of the closure 10 occurs as the rim 14 moves beyond the inner ends of the recesses 32 and ribs 36. At this point, the projections 34 tend to slightly outwardly deform the rim 14 to effect a sealed engagement thereof with the first flange face 20 above the ribs 36 and with the outer face 28 of the second flange 24 continuous across the recess 32. A sealed engagement is also of course effected with the remainder of the flange faces 20 and 28 with the panel 16.

FIG. 6 depicts an alternate manner of providing for the escape of trapped air during the mounting of the closure 10, the first and second flanges, 18 and 24 respectively, are provided with a pair of air holes 38 and 40, thus providing an air path until just prior to a complete seating of the closure 10. Preferably the holes 38 and 40 are diametrically opposed to provide 180° displacement between hole 38 and hole 40. Such displacement between the holes 38 and 40 is desirable in restricting any unwanted discharge of the container contents.

Once the closure 10 is completely seated, it will be appreciated that the rim portion of the cartridge 12 is rigidified by and retained between the first flange 18 and the second flange 24. The second flange 24 is slightly thicker than the first flange 18 and, in conjunction with the longer flange 18, provides a positive means to prevent any deformation of the container rim 14. Thus, when the container is, for example, a grease cartridge any deformation of the rim which might interfere with the smooth insertion and operation of the plunger of a grease gun is eliminated. This constitutes a significant improvement over the conventional metal closures which easily dent and deform the rim when a cartridge is accidentally dropped.

From the foregoing, it will be appreciated that the closure of the instant invention, while relatively simple in construction, incorporates unique structural features productive of many advantages heretofore not afforded by conventional container closures. Such advantages include providing for an inward guiding of the container rim into the closure without a jamming or de-

forming of the rim, allowing the escape of trapped air from the container as the closure is mounted, rigidifying and protecting the container rim so as to preserve the shape thereof for the accommodation of, for example, a grease gun plunger, and facilitating a coloring of and printing of the closure as desired.

The foregoing is considered illustrative of the principles of the invention, and various changes may be made without departing from the scope of the invention as defined by the following claims.

What is claimed is:

1. In a closure for a container opening having a rim about the opening, wherein the closure comprises a panel section and a first depending integral flange projecting from the panel section having an inner face defining a socket adapted to snugly receive the container rim, the improvements which comprise:

a second depending integral flange on the panel section having an outer face coextensive with the first flange and projecting from the panel in inwardly spaced parallel relation thereto, said flanges defining a container rim receiving channel about the closure, and air release means formed in said flanges for enabling release of trapped air as the closure is mounted on the container, said air release means comprising at least one groove in the outer face of the second flange and a pair of laterally spaced ribs on the inner face of the first flange in opposed relation to said groove, said ribs being generally aligned with the opposed edges of the groove.

2. The closure of claim 1 wherein said groove and ribs extend transversely of the flanges and terminate in spaced relation to said panel section.

3. The closure of claim 2 including an outwardly directed projection on the outer wall of the second flange between the end of the groove and the panel section.

4. The closure of claim 2 wherein said channel narrows inwardly toward said panel section to effect a progressively greater engagement with an introduced container rim.

5. The closure of claim 4 wherein the narrowing channel is defined by the outer face of the second flange tapering slightly away from the inner face of the first flange outward from said panel section, the inner face of the first flange being generally perpendicular to the panel section.

6. The closure of claim 1 wherein said channel narrows inwardly toward said panel section to effect a progressively greater engagement with an introduced container rim.

7. The closure of claim 6 wherein said first and second flanges include inner and outer faces, the narrowing channel is defined by the outer face of the second flange tapering slightly away from the inner face of the first flange outward from said panel section, the inner face of the first flange being generally perpendicular to the panel section.

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