Sept. 5, 1967 D. O. BIGLIN 3,339,786

CONTAINER AND VENTING CLOSURE CAP FOR SAME

Filed June 23, 1965

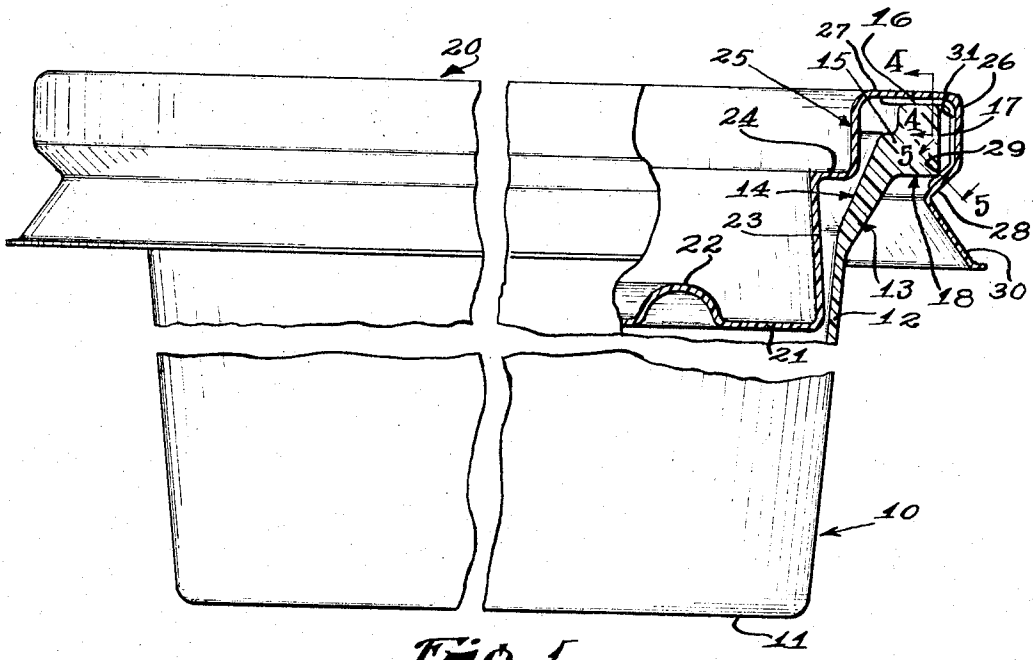

FIG. 1.

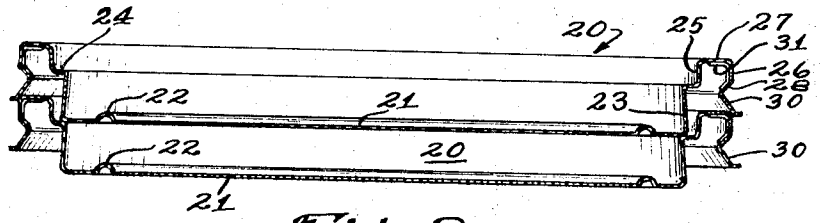

FIG. 2.

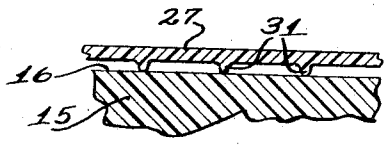

FIG. 4.

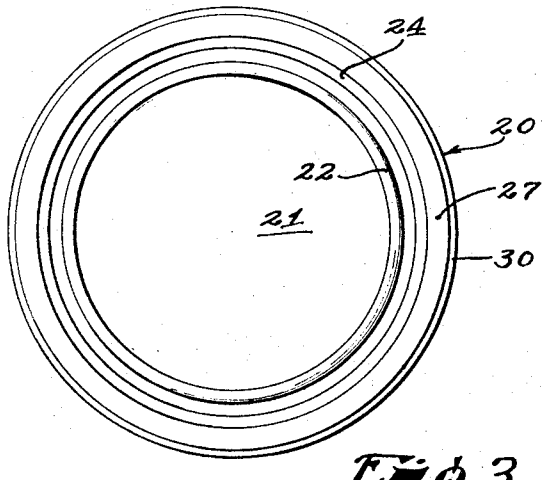

FIG. 3.

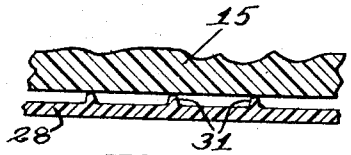

FIG. 5.

INVENTOR.
DUANE O. BIGLIN
BY Spencer P. Blaylock Jr
W. A. Schaper
ATTORNEYS

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CONTAINER AND VENTING CLOSURE CAP FOR SAME

Duane O. Biglin, Toledo, Ohio, assignor to Owens-Illinois, Inc., a corporation of Ohio

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3 Claims. (Cl. 220—44)

ABSTRACT OF THE DISCLOSURE

A container and closure cap combination wherein the container has a flared upper neck section comprising an annular bead of relatively large cross-section providing axially spaced apart upper and lower walls extending radially, and a thermoplastic closure cap fitting over the bead with a panel in sealing contact with the upper wall and an inward extension on the cap skirt in holding engagement with the lower wall, together with ribs or other venting means formed internally of the cap skirt.

The present invention which basically is disclosed in my copending application, Ser. No. 466,194, filed June 23, 1965, relates to thermoplastic containers and venting closure caps for same.

More particularly, the invention pertains to plastic or thermoplastic containers and closure caps which incorporate novel means for venting gases from the containers to the atmosphere, while maintaining wholly satisfactory sealing of the package for all practical purposes. Accordingly, I have provided both a container and closure cap which are formed from relatively thin sheet thermoplastic material, the specific design being such that the closure caps may not only be readily stacked, or nested, for handling, but also are very largely self-centering during their application to the containers, thus facilitating and materially speeding up the capping operation.

A further object of my invention is the provision of a novel venting means which also contributes very importantly to strengthening and stiffening of the closure, this being a distinct advantage since the cap is formed of very thin, normally highly flexible thermoplastic sheeting, as stated above.

Other objects will be in part apparent and in part pointed out hereinafter.

In the accompanying drawings forming a part of my application:

FIG. 1 is a fragmentary sectional elevational view of a container and closure cap embodying my invention;

FIG. 2 is a sectional view showing the manner in which closure caps embodying my invention may be nested or stacked;

FIG. 3 is a top plan view of one of the closure caps;

FIG. 4 is an enlarged fragmentary sectional view taken substantially along the plane of line 4—4 of FIG. 1; and

FIG. 5 is a sectional view taken substantially along the plane of line 5—5 of FIG. 1.

In that form of my invention illustrated herein, the container **10**, which may be formed of a thin sheet of thermoplastic materal, comprises a bottom **11**, preferably of circular form, there being an upstanding annular side wall **12** rising from the periphery or margin of the bottom and terminating at its upper end as a flared annular section **13** of upwardly increasing radial thickness. Thus there is provided an internal sloping guiding surface **14**, which, as will become evident, aids in stacking, as well as in initial positioning of the closure cap relative to the mouth of the container. A substantially thickened annular bead **15** is formed integral with and at the upper end of the thickened upper portion of the annular section **13**, presenting a flat circular rim **16** or top wall, and an annular vertical side wall **17** which merges with a lower radial annular wall **18** extending inwardly toward the flared section **13**.

The closure cap **20**, which, as stated, may be formed from thin sheet thermoplastic material of very light weight, comprises a depressed central panel portion **21**, or top wall, having an annular internal stiffening rib **22**, near its periphery. An upstanding annular wall **23** rising from the margin of the panel tapers slightly upwardly and inwardly and merges at its upper end with a radial annular shelf **24**. From the outer margin of this shelf **24** rises a vertical annular wall **25** which is spaced radially inward from a depending external annular wall **26**, these two walls **25** and **26** being joined together by a top wall **27**, the latter intended to very firmly or intimately contact the aforementioned rim **16** of the container. These walls **25** and **26** together with the top wall **27** create an inverted annular channel to loosely accommodate or straddle the aforementioned bead **15**, the loose fit being advantageous in assembling, as is apparent.

In order to securely retain the closure on the container, yet permit easy removal, when desired, an inwardly downwardly tapered extension **28** or lip is provided at the lower margin of the outer wall **26** to snugly engage the annular corner **29** at the juncture of the radial lower wall **18** and the side wall **17**. An annular flared extension **30** at the lower margin of the inwardly tapered lip **28** provides means aiding both in nesting of a stack of closures and in removal of closures from their containers, as is believed apparent.

Venting of gases from the closed containers is obtained by providing minute radial ribs **31**, or beads, across the interior surface of the top wall **27**, exterior side wall **26**, and the inwardly tapered extension **28** or lip. Thus, while the spaces created by the small ribs are such that the product cannot leak through to the outside, if excessive internal gas pressure should develop, it can freely escape to the atmosphere. Any desired number of these ribs may be utilized and their specific dimensions will, of course, be dictated by the particular circumstances prevailing with respect to the product being packaged, etc.

It is believed to be evident that the venting ribs **31**, being on the outer diameter of the attaching skirt or channel portion, the strength and rigidity of the sealing area will be materially increased. Also, the depressed central panel and tapered wall therearound, function quite effectively as a pilot during closure cap application, as well as a means for facilitating delivery of the caps through automatic capping equipment.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. A closure cap comprising a top wall, an upstanding annular side wall at the periphery of said top wall, means in a plane above said top wall and in part above the plane of the side wall and radially outward from both walls forming an annular downwardly facing channel, said channel having an outer wall formed with an annular inwardly downwardly inclined extension to function as part of means for retaining the closure cap on a container, venting means formed internally of at least a portion of said channel comprising a plurality of radial ribs of minute size formed on the interior surface of the top and outer walls of the channel and the container engaging surface of inclined extension and an annular downwardly outwardly inclined straight extension at the lower margin of the inclined extension to facilitate both nesting of a stack of closure caps and their removal from containers.

2. In combination, a wide-mouth container formed of a thermoplastic material and comprising a circular bot-

tom, an annular upstanding wall having a flared upper section of upwardly increasing radial thickness, an annular bead of substantial cross-section at the upper margin of the flared section, said bead having a flat top rim and an annular radial wall spaced below said rim and extending inwardly toward the upstanding wall, a closure cap formed of a thermoplastic material and comprising a panel portion receivable in the container mouth, an inverted annular channel-like member near and integral with the panel portion, to straddle said bead, a sloping inwardly directed extension depending from the channel member for holding engagement with the annular radial wall, and venting means internally of the channel and sloping extension.

3. A combination as defined in claim 2, the venting means being at least one radial rib extending across the inner face of certain walls of the channel and the interior face of the sloping extension which depends from the channel.

References Cited

UNITED STATES PATENTS

2,953,272	9/1960	Mumford et al.	215—41
3,112,841	12/1963	Martinelli	220—44
3,179,283	4/1965	Amberg	220—97 X

THERON E. CONDON, *Primary Examiner.*

G. T. HALL, *Assistant Examiner.*