

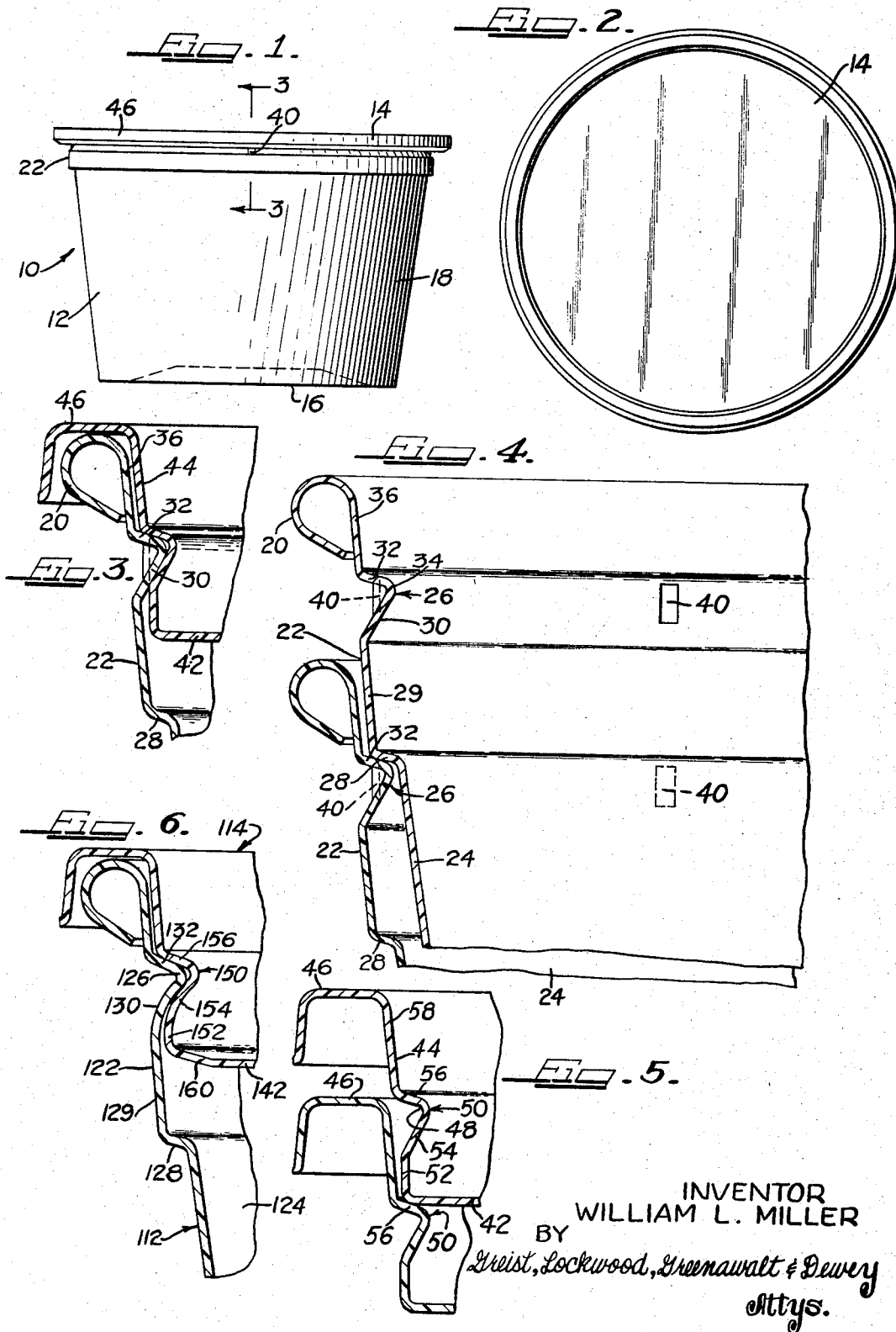
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CONTAINER AND CLOSURE LID

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CONTAINER AND CLOSURE LID

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ABSTRACT OF THE DISCLOSURE

A thin walled, thermoformed plastic container having a co-operating closure lid wherein the container is characterized by an inwardly projecting nose extending around the entire periphery adjacent the mouth and the lid includes a depressed center panel adapted to telescope within the container mouth and a peripheral wall adjoining the panel which has an inwardly depressed circular groove in which the nose is adapted to be seated so as to lock the lid in position when it is telescoped into the container mouth, the nose and groove constituting part of an antineesting feature for both the container and the lid when a plurality thereof are in stacked relation, and a means incorporated in the nose for venting the container when it is used for a product which may produce excessive internal pressure which would otherwise unseat the nose and release the lid.

This invention relates to packaging and is more particularly concerned with improvements in a container and a closure lid therefor which is especially adapted for packaging a variety of materials including food products.

Various container and closure lid combinations have been developed for packaging a variety of products including foodstuffs, with the container and/or closure lid being formed of thin walled plastic usually of a type which may be thermoformed from a web or sheet, employing suitable forming dies. Generally, an effort has been made to incorporate in containers of this type so-called antineesting features which facilitate the use of automatic machinery involving the dispensing of the containers and/or closure lids from a nested stack thereof. Also, efforts have been made to incorporate in container and lid combinations some means for venting the container where it is to be used for packaging of a food product such as, for example, cottage cheese, which may generate a gas after it is enclosed in the package so as to produce pressure within the container sufficient to force the closure lid off if venting is not provided for. Many of these containers and lid combinations have not been satisfactory for various reasons, and it is a general object of the present invention to provide a container and lid combination especially adapted to be thermoformed from plastic sheet material which is more satisfactory than previous designs, particularly, in the packaging of foodstuffs.

It is a more specific object of the invention to provide a container and a closure lid therefor, each of which is adapted to be formed from plastic sheet material so as to coact with each other to provide a sanitary, economical and rugged package having a closure member forming a highly satisfactory seal with the container when applied and readily removable by the consumer for access to the interior of the container.

It is another object of the invention to provide a container and lid combination of the type described which is capable of being economically produced by automatic machinery with high volume mass production techniques.

It is still another object of the invention to provide a

container and lid combination wherein the container has an inwardly projecting nose extending around the entire periphery adjacent the mouth and the lid has a co-operating, inwardly depressed circular groove in which the nose is adapted to be seated when the lid is telescoped into the mouth of the container and wherein the locking nose and groove constitute part of the antineesting features for both the container and the lid.

It is a still more specific object of the invention to provide a container and lid combination wherein the container comprises a bottom wall and an upstanding side wall which terminates in an outwardly extending curled rim portion and which has a combination inwardly projecting lid locking bead and stacking shoulder adjacent the rim adapted to co-operate with a locking groove in the outer surface of the side wall of the lid when assembled therewith so as to lock the same in closure forming position within the mouth of the container, and also adapted to co-operate with a downwardly facing shoulder below the same on a like container to provide an antineesting feature when a plurality of the containers are assembled in stacked relation.

It is another object of the invention to provide a combination container and closure lid wherein the container has an inwardly directed bead of generally V-shaped cross section extending about the periphery thereof adjacent the mouth of the container and the lid has a side wall with a co-operating locking groove in the outer periphery thereof which is spaced above the bottom panel of the lid so as to provide a tight fit with the container bead and reduce the tendency of the lid to become loose when there is upward bulging of the bottom panel as a result of pressure within the container.

It is another object of the invention to provide a container member having an internal shoulder adjacent the top opening thereof which is adapted to engage in a groove in the external wall of a closure member so as to form a seal in the vicinity of the groove and the container member being formed with a venting means incorporated in the shoulder which provides a passageway for egress of gaseous fluid without resulting in removal of the lid due to a buildup of pressure within the container.

It is a further, more specific object of the invention to provide a novel closure lid for a plastic container which is configured so as to provide a sanitary overlay for the lip of the container, which is adapted to nest with other lids without damage, which is molded from one piece plastic sheet materials, which has a configuration which prevents damage to the lids even when a stack of nested lids is subject to severe compressive action, which has an easy feed action in a lid dispensing device, which has a combination lid retaining and stacking ring for coaction with the bottom of the next adjacent container when the containers assembled with lids are placed in stacked relation and which is otherwise well adapted for its intended purpose.

These and other objects and advantages of the invention will be apparent from a consideration of the container and the lid therefor which is shown by way of illustration in the accompanying drawings wherein:

FIGURE 1 is a side elevation of a container with a closure lid attached thereto which embodies the principal features of the invention;

FIGURE 2 is a plan view of the container of FIGURE 1;

FIGURE 3 is a fragmentary cross section taken on the line 3-3 of FIGURE 1, showing the closure lid applied to the container;

FIGURE 4 is a fragmentary vertical sectional view showing two of the containers in stacked relation;

FIGURE 5 is a fragmentary, vertical sectional view showing two of the closure lids in stacked relation; and FIGURE 6 is a fragmentary, vertical section similar to FIGURE 3 showing a modified form of the container and closure lid.

Referring first to FIGURES 1 and 2 of the drawings, there is illustrated a package 10 comprising a cup-shaped container 12 and a matching closure lid 14 applied to the mouth of the container. For the purpose of illustration, the container 12 may be considered as especially designed for packaging of a food product, for example, cottage cheese.

The container 12 comprises a bottom panel structure 16 (FIGURE 1) of conventional construction and a side wall 18 which extends upwardly from the margins of the bottom panel 16, with an outward taper or slant, and which terminates at a mouth defining, outwardly curled rim portion 20 (FIGURES 3 and 4). The upper portion or section 22 of the side wall 18 immediately below the rim portion 20 is offset outwardly of the lowermost portion 24 thereof and is shaped to provide a peripherally extending stacking ring structure which incorporates a lid locking bead formation 26 for retaining the closure lid member 14 in the mouth of the container. An outer, downwardly facing stacking shoulder 28 is formed to extend about the periphery of the container at the top edge of the lower body portion 24 where it joins the lowermost edge of the outwardly offset side wall portion 22. A lower marginal portion 29 of the side wall section 22 extends upwardly to an inwardly and upwardly tapered or slanted lower or bottom portion 30 of the locking bead formation 26. The locking bead formation 26 includes a top shoulder forming portion 32 which extends upwardly and outwardly from the junction at 34 with the portion 30 and which terminates at the lower edge of a short wall section 36, the latter merging into the curled rim portion 20. Preferably, the locking bead formation 26 incorporates inwardly opening, vertical slot formations 40 which constitute passageways for fluid and serve as a venting means when the closure lid 14 is assembled in mouth closing position on the top of the container 12.

The closure lid member 14 (FIGURES 1, 2, 3 and 5) is formed from a single sheet of material which is shaped to provide a flat bottom panel 42 and a side wall 44 extending upwardly from the margins thereof with a relatively small outward taper, the latter corresponding approximately to the taper of the upper wall section 22 of the container so as to telescope within the latter when the lid 14 is assembled with the container 12. The side wall 44 terminates at its upper edge in a top rim portion 46 of downwardly opening, channel-shaped cross section which is adapted to encompass the curled rim portion 20 of the container 12 and form a cap over the same when the lid 14 is assembled in the mouth of the container 12. The side wall portion 44 of the closure lid 14 is formed with an outwardly opening, peripheral recess 48 provided by an inwardly extending bead formation 50 for co-operation with the inwardly projecting locking bead formation 26 on the container 12, the bead formation 26 being seated in the recess 48 when the closure lid is in mouth closing position with the side wall portion 44 telescoped within the upper side wall portion 22 of the container 12. The recess defining bead formation 50 is spaced above the bottom panel 42 by a side wall section 52 of appreciable depth or width so that upward flexing of the bottom wall panel 42 due to pressure conditions within the container will have a minimum effect on the seal forming contact between the bead formations 26 and 50. The locking bead formation 50 has a cross sectional configuration corresponding approximately to the cross section of the locking bead 26 with a lower or bottom inwardly and upwardly tapering peripheral ring portion 54 extending above the wall section 52 and connecting with an outwardly and upwardly tapered portion 56 forming an upwardly facing shelf which extends to the top wall section

58, the upper portion of which constitutes the inner wall of the rim formation 46.

When the closure lid 14 is assembled with the container 12 to close the mouth of the latter, the rim section 46 of the closure lid 14 forms a cap over the curled rim portion 20 of the container 12 and the locking bead formation 26 on the container 12 is seated in the recess 48 provided by the locking bead formation 50. An effective seal is provided by the contact between the top shoulder portions 32 and 56 and the bottom ring portions 34 and 54 of the co-operating bead formations 26 and 50. Any upward flexing of the closure lid bottom panel 42 due to increase in pressure within the container 12 does not appreciably affect the seal between the two locking beads 26 and 50 since the resilient wall section 52 is interposed between the panel 42 and the bead 50. An excess of pressure within the container due to gas formation in the product contained will be relieved or vented through the venting slots 40. When the internal pressure in the container reaches a predetermined amount the top and bottom ends of the slots 40 will open and relieve the pressure before it is sufficient to lift the closure lid and separate the locking bead formations 26 and 50.

The stacking of the containers 12 is illustrated in FIGURE 4. The internal diameter of the container 12 at the innermost edge of the locking bead formation 26 is appreciably less than the maximum external diameter of the bottom stacking ledge or shoulder 28 so that when one container is positioned in nested relation within another the shoulder 28 of the top container rests on the inwardly and downwardly sloping ledge 32 of the bead formation 26 of the bottom container so that the container bottom wall portions 24 and the top wall portions 22 are spaced from the corresponding wall portions of the next container in the stack and the bottom container will readily drop away from the next container in the stack when dispensed from a magazine or the like.

The closure lids 14 are adapted to be stacked for dispensing as shown in FIGURE 5. The diameter of the innermost edge of the locking bead 50 is appreciably less than the external diameter of the bottom panel 42 of the lid so that the lids may be stacked with the peripheral portion of the bottom panel 42 of each lid member resting on the inwardly sloping ledge 56 of the locking bead formation 50 on the lid member beneath the same in the stack so that the wall section 52 is spaced from the wall section 58 and the members are readily separated for dispensing from the stack.

Referring to FIGURE 6, there is illustrated a modification of the container and lid member. In this form the container 112 has an upper wall portion 122 with a stacking ring structure including a lid locking bead formation 126 which is modified by forming the bottom portion 130 with a rounded contour so that it curves into merging relation with the upper margin of the wall portion 129, the latter defining the lower portion of the stacking ring structure. The upper shelf forming section 132 of the locking bead 126 is slanted downwardly to a somewhat greater degree than the shelf section 32. The co-operating bead formation 150 has the lower wall section 154 formed on a curve so as to merge into the wall section 152 which separates the same from the bottom panel 142. The curvature of the bead sections 130 and 154 is such as to provide good contact over a substantial area between the engaging surfaces of these sections when the lid 114 is telescoped within the mouth of the container 112 and seated in mouth closing position. The inner bottom panel 142 of the closure lid 114 has a relatively narrow marginal ring section 160 which tapers upwardly and outwardly to the juncture with the vertical wall section 152 and counteracts the tendency of the seal forming contacting surfaces of the wall sections 130 and 154 to separate due to upward movement of panel 142 resulting from increased pressure in the container. This panel 160 permits substantial upward move-

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ment of the panel 142 without materially decreasing the contacting areas between the wall sections 130 and 154. The bead formations 126 and 150 both have their innermost surfaces rounded and the ledge forming top portions 132 and 156 both taper inwardly and downwardly to a somewhat greater degree than the ledge formations 32 and 56.

The combination lid retaining and stacking ring structure incorporated in both the container and the closure lid is, in each member, spaced from panels or other sections which would tend to reduce the resiliency in these structures so that the lid will readily snap into mouth closing position within the container and will not fall out with the development of minor pressure in the container which may result from the generation of gas by the contents or from squeezing pressure on the side wall when the container is grasped in handling the same. The location of the stacking ring results in more uniformity when the members are fabricated by thermoforming sheets of a suitable plastic material, such as, for example, high impact styrene, since the stacking rings are formed in the early stage of the plastic stretch as the plastic sheet fills the forming mold and before it stretches to minimum thickness.

While specific materials and particular details of construction have been referred to in illustrating the preferred forms of the invention, it will be understood that other materials and equivalent structural details may be resorted to within the spirit of the invention.

I claim:

1. A self-venting sanitary package comprising a one piece thin walled plastic container having a bottom wall and an upstanding, outwardly tapering side wall terminating at an outwardly curled lip portion defining an open end and a one piece snap-on manually removable closure forming lid of thin wall plastic adapted to be inserted within and retained on the open end of said container, said lid having a bottom forming panel and an outwardly tapering side wall upstanding from the peripheral edge of said bottom panel and terminating at an outwardly extending rim portion which rim portion is shaped to engage over the curled lip of the container when said lid is assembled in closure forming relation with said container, said container having an inwardly projecting shoulder forming bead in the side wall immediately below said lip portion and said lid having an inwardly depressed groove formed by an inwardly projecting bead in the side wall thereof which is spaced above said bottom panel and which is adapted to receive said container bead in snap-in, seal forming relation, said container bead and said lid bead having similar cross sectional configuration so that said container bead will seat in said groove and provide peripherally extending sealing contact on at least two vertically spaced surface areas extending in intersecting planes which are inclined relative to the vertical axis of said container.

2. A package as recited in claim 1, and said container bead and said lid bead having cross-sectional configurations which provide sealing contact at two spaced surface engaging areas which are in inwardly converging planes extending in a generally diagonal direction upwardly and downwardly relative to the vertical axis of the package.

3. A closure member for the mouth end of a thin wall plastic container which container is characterized by an outwardly sloping side wall portion at the mouth thereof terminating in an outwardly turned top rim portion and having an inwardly extending peripheral locking bead for co-operation with the closure member which locking bead has oppositely facing top and bottom surfaces in inwardly converging planes which are inclined relative to the vertical axis of the container, said closure member being formed of resilient plastic for snap-on engagement over the container rim portion and including a bottom wall forming panel and an upstanding annular wall

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disposed around the margin of said bottom wall panel which slants upwardly and outwardly and terminates at a rim portion adapted to encompass the rim portion of the container, said annular wall having a continuous groove in the outer face thereof which opens outwardly and which is spaced above the peripheral edge of said bottom panel and said groove having a configuration corresponding generally to the configuration of said bead thereby providing diverging surfaces which are inclined relative to the vertical axis for frictionally engaging the opposed top and bottom surfaces of said container locking bead so as to form a separable double seal therewith.

4. A closure member according to claim 3, and said bottom wall panel having a relatively narrow rim section at the peripheral edge thereof which is slanted on a relatively small angle upwardly and outwardly to a juncture with the bottom edge of the annular wall and the external diameter at the peripheral edge of said bottom wall panel being less than the internal diameter of the oppositely disposed container wall portion whereby said peripheral edge is normally spaced from said container wall portion and upward pressure on the bottom wall panel resulting from predetermined increase in pressure within the container expands the annular wall and increases the area in sealing engagement with the bottom surface of said locking bead.

5. A self-venting sanitary package comprising a one piece container having a bottom wall and upstanding side wall terminating in an outwardly curled lip portion defining an open end and a one piece snap-on, manually removable, closure forming lid adapted to be inserted within and retained on the open end of said container, which lid has a bottom forming panel and upstanding side walls terminating in an outwardly extending rim portion shaped to encompass the curled lip of the container when said lid is assembled in closure forming relation with said container, said container having an inwardly projecting bead of generally V-shaped cross section and a side wall adjacent said lip portion and said lid having an inwardly depressed, generally V-shaped, outwardly opening groove in the side wall which is spaced above said bottom panel, and which is adapted to receive the container bead in snap-in seal forming relation, said container bead normally seating in said groove so that there is seal forming engagement between vertically spaced top and bottom surfaces of said bead and the top and bottom surfaces defining said groove while the bottom panel is free of sealing engagement with the container wall at the periphery thereof, and said container bead having circumferentially spaced, axially extending grooves which open inwardly of the container and are closed by the interengaging surfaces when there is minor pressure in the container and which are open when there is excessive pressure in the container so as to move the groove forming portions of the lid in a direction to separate the interengaging top surfaces and unseat the container bead thereby to vent the container so that the movement of the lid portions is arrested and the lid remains on the container.

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