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L. D. HOLDER ET AL

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SANITARY PACKAGES

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FIG. I

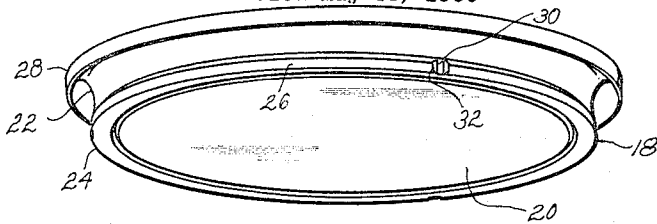


FIG. II

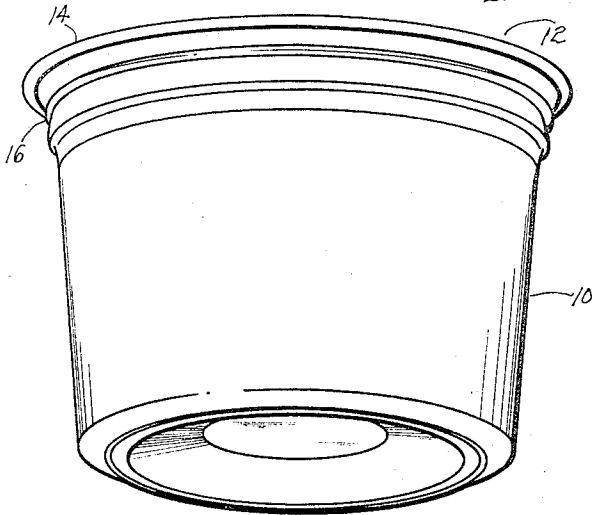


FIG. III

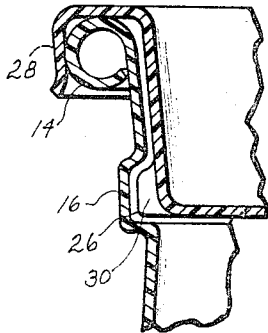


FIG. IV

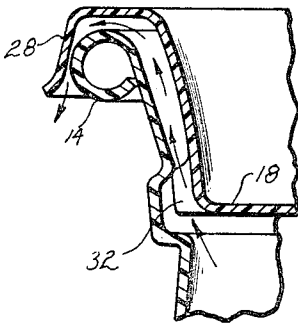


FIG. VI

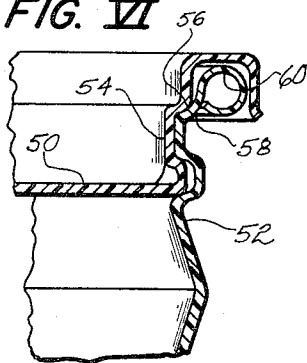
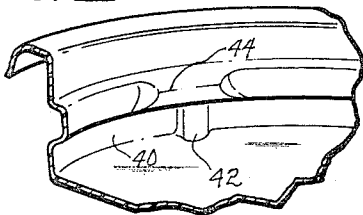


FIG. V



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ABSTRACT OF THE DISCLOSURE

A container and sealably fitted lid having means for permitting escape of entrapped gas while the lid is fitted into the top of the container.

This invention relates to a container and closure and more particularly relates to a container and closure member which can be fitted together to present a substantially airtight enclosure while permitting entrapped gas to escape during fitment.

The packaging of comestibles in containers having removable lids applied by automatic machinery poses a number of problems. Aside from the handling problems encountered during engagement of the lid and container, a rather severe problem arises when the lid is designed to closely fit the container to provide a relatively air tight compartment. More specifically, air or gas entrapment within the container will tend to cause the lid to bulge outwardly as the lid is pressed into the container. Although a number of methods have been developed for self-venting of packages containing products which generate gases after enclosure, for example, the method disclosed in U.S. Patent No. 3,061,139, these methods in general do not resolve the bulging or gas entrapment problem associated with the press-fitting of lids into filled containers particularly during high-speed production operations.

Accordingly, it is a principal object of the present invention to provide a container and sealably fitting lid having means which will permit the escape of entrapped gas while the closure is being fitted into the top of the container.

It is another object of the present invention to provide a substantially air tight container which will permit the escape of entrapped gas from the container while the closure is being fitted into the top of the container.

It is a further object of this invention to provide a container and lid combination which is sturdy, sanitary and capable of being rapidly filled and fitted together without significant distortion of closure or container.

It is another object of this invention to provide a container and lid combination which can be fitted together utilizing high speed automatic machinery.

It is another object of the present invention to provide a container and lid which can be fitted together utilizing automatic machinery at high speeds without causing entrapment of air which would tend to bulge the container lid.

It is another object of the present invention to provide method and means to carry out the objects set forth above.

Other objects of this invention will in part be obvious and will in part appear hereinafter.

These and other objects are attained by novel container means and closure means wherein the container means has an open end defining an edge and a groove inside said container means spaced downwardly from and extending substantially parallel to said edge and wherein the closure means has a side wall at its outer margin, said side wall having an outwardly extending edge portion designed to engage the groove of said container means and venting means associated with said outwardly extending edge portion.

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FIG. 1 is a perspective view of a container lid means illustrating a particular venting means.

FIG. II is a perspective view of the container means designed to mate with the lid means of FIG. I.

FIG. III is a side view partly in section illustrating the lid and container means in engagement.

FIG. IV is a side view partly in section illustrating the lid and container means just prior to complete engagement.

FIG. V illustrates an alternate embodiment of a lid. The lid is projected with reverse indentations in the side wall of the lid some of which are positioned immediately above the venting means.

FIG. VI is a side view partly in section illustrating an alternate embodiment of the lid and container having a seal or line of continuous contact between the lid and container above the venting grooves.

Referring to the drawings, and more particularly FIGS. I-III, there is schematically shown a container 10 having an open end 12 defining an edge 14. Inside the container 10 below the edge 14 is a groove 16 circumferentially extending parallel the edge 14 of said container. Lid 18 which is designed to snap into container 10 comprises generally the main lid portion 20 with a side wall 22 located at the outer margin or edge 24 of the main lid portion 20. The side wall 22 has an outwardly extending edge portion or ridge 26 which is designed to engage the groove 16 of the container as illustrated in FIG. III and an overhanging portion 28 at the upper edge of said side wall 22 designed to overhang the edge 14 of the container 10. Along the outwardly extending edge portion or ridge 26 of the lid 18 are venting means 30 which comprise a series of integrally spaced cutaways 32. As can be seen in FIG. IV, these cutaway portions 32 permit the egress of gas during the sealing process until the outwardly extending edge portion 26 of the lid enters the groove 16 of the container preventing any further egress of gas from within the container. However, at this point the substantial portion of the entrapped air has been released permitting the lid 18 to engage the container at a pressure sufficiently close to normal atmospheric to practically eliminate the tendency for the lid 18 to bulge. FIG. V illustrates an advantageous feature which may be used in conjunction with an interrupted or vented groove 40 to reduce resistance to air passage above the cutaway 42 which comprises an indentation 44.

FIG. VI is a side view which illustrates an alternate embodiment wherein the lid 50 engages container 52 along its side wall 54 such that a shoulder portion 56 of the lid 50 is seated on a shelf portion 58 provided inside the container 52 spaced down from the edge 60 of said container. The seal thus obtained extends all around the inside of the container providing a continuous line of contact between the container and lid.

The above description and particularly the drawings are set forth for the purpose of illustration only and not for the purpose of limitation. Although the illustrated embodiment is round, it is obvious that the container may be of varied shapes, such as for example, square, hexagonal, rectangular, oval and the like.

As earlier indicated, the present invention comprises container means and closure means wherein the container means have an open edge and a groove inside the container spaced downward from and extending substantially parallel to said edge and wherein the closure means has a side wall at its outer margin, said side wall having an outwardly extending edge portion designed to engage the groove of said container and venting means associated with said outwardly extending edge. The venting means associated with the outwardly extending edge of the lid preferably comprises a series of grooves or cutaways extending across the outwardly extending edge. The number

of grooves or cutaways may vary but it is preferred particularly in circular container and lid fits that the number of grooves or cutaways be at least 3. In the case of small containers having openings ranging between 3 to 40 square inches, it is generally desirable that the total or sum of the cross sectional areas of the grooves or cutaways at the periphery of the lid range anywhere between 0.005 to 0.05 square inch. In this invention, the venting means are associated with the outwardly extending edge of the lid to provide a relatively straight and streamlined egress of gas, generally air, from the container during the press fitting operations just prior to sealing contact between lid and container.

In general, the sealing surface or line of continuous contact between the lid and container can be above or below the venting means. However, it is desirable in most instances to have the seal or line of continuous contact between the lid and container above the venting means. This is generally preferred because provision of a seal or continuous line of contact below the venting means would generally require that the venting grooves or cutaways be rather shallow in order to provide the necessary surface areas for sealing. In most instances after the outwardly extending edge of the lid has entered the groove of the container, the passage through the grooves or cutaways between the inside of the container and area above the venting grooves is still open. FIG. VI illustrates a preferred embodiment of the present invention wherein the sealing surface is provided between the groove and the edge of the container by shelf means and shoulder means. The shelf means can be located either on the container or closure means—the shoulder means obviously being located on the opposite component. However, it is possible in some instances to eliminate the shelf means and shoulder means completely and rely on an overhanging portion of the lid to provide a seal between the overhang and the edge of the container. Additionally, when the seal is above the groove, any pressure exerted from within the container will tend to tighten the seal between the lid and container.

The material from which the container and closure means are formed may be of any material of sufficient strength to be fabricated relatively thinly and sufficiently flexible to permit the lid to be press fitted into the container top. Typical materials are paper, cardboard, plastics, etc. A preferred plastic material is rubber-modified polystyrene which can be manufactured relatively thinly and is sufficiently flexible for press fitting. When this type of plastic is used, the side wall thickness of the container will generally vary between 3 to 80 mils average. The lid is generally in the same range although sometimes constructed of thinner material than the container.

The present invention is uniquely designed for fast filling and sealing operations. In general, the container is filled with a comestible in an automatic filling line and transported to a lid insertion station wherein a lid is brought downwardly into the top of the container. At this point as the outwardly projecting edge portion of the lid enters the top of the container, air or other gases are permitted to escape through the cutaway portions until a continuous line of contact is effected between the lid and the container.

These containers are usually suited for containing various comestible materials in a relatively air-tight and sanitary manner. In particular these containers can be rapidly sealed or press fitted with a lid closure wherein a minimum of entrapped air is retained thereby further protecting the contents against the oxidizing effects of air and other gases.

The above description and particularly the drawings are set forth for purposes of illustration only. Any variations and modifications thereof will be obvious to those skilled

in the art and can be made without departing from the spirit and scope of the invention herein described.

What is claimed is:

1. A sanitary package comprising container means and closure means, wherein the container means has a sealing surface providing a line of continuous contact with the closure means after assembly to the closure, has an open end defining an edge and a groove inside the container spaced downwardly from and extending substantially parallel to said edge, the inner surface of said container between said edge and said groove being substantially peripherally continuous, and wherein said closure means has a side wall at its outer margin, said side wall having an edge portion projecting outwardly beyond said side wall, designed to engage the groove of said container, and venting means in said outwardly extending edge.
2. The package according to claim 1 wherein the sealing surface is above the container groove.
3. The package according to claim 1 wherein the container means and the closure means are provided with shelf means and shoulder means which form a line of contact, when the outwardly extending edge portion of the closure means enters the groove of the container means, above said groove.
4. The package according to claim 1 wherein the venting means in said outwardly extending edge comprises at least one groove cutting across said outwardly extending edge portion.
5. The package according to claim 1 wherein the venting means comprises at least three grooves cutting across said outwardly extending edge portion.
6. The package according to claim 1 wherein the cross sectional area of said venting means ranges anywhere between 0.005 to 0.05 square inch and wherein the container has a cross sectional open end between 3 to 40 square inches.
7. The package according to claim 1 wherein the container is composed of a rubber-modified polystyrene plastic material.
8. The container according to claim 7 wherein the side wall thickness of the container varies between 3 to 80 mils average.
9. A sanitary package comprising container means and closure means, wherein the container means has an open end defining an edge, and a groove inside the container spaced downwardly from, and extending substantially parallel to said edge, said closure means having a side wall at its outer margin, said side wall having an outwardly extending edge portion designed to engage the groove of said container, venting means associated with said outwardly extending edge for venting said container means during placement of the closure means thereon, and shoulder and shelf means on the container and closure means which form a continuous line of contact above said groove when the outwardly extending edge portion of the closure means enters the groove of the container means.
10. The package of claim 9 wherein the venting means comprises at least one groove cutting across said outwardly extending edge portion, and at least one indentation in alignment with said groove between said groove and the line of contact of the closure and container means.

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