United States Patent

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[54] **VENTED PACKAGE**
4 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** ..... **220/44 R,** 220/60 R
[51] **Int. Cl.** **B65d 51/16**
[50] **Field of Search** ..... 220/44 R, 44 A, 60 R

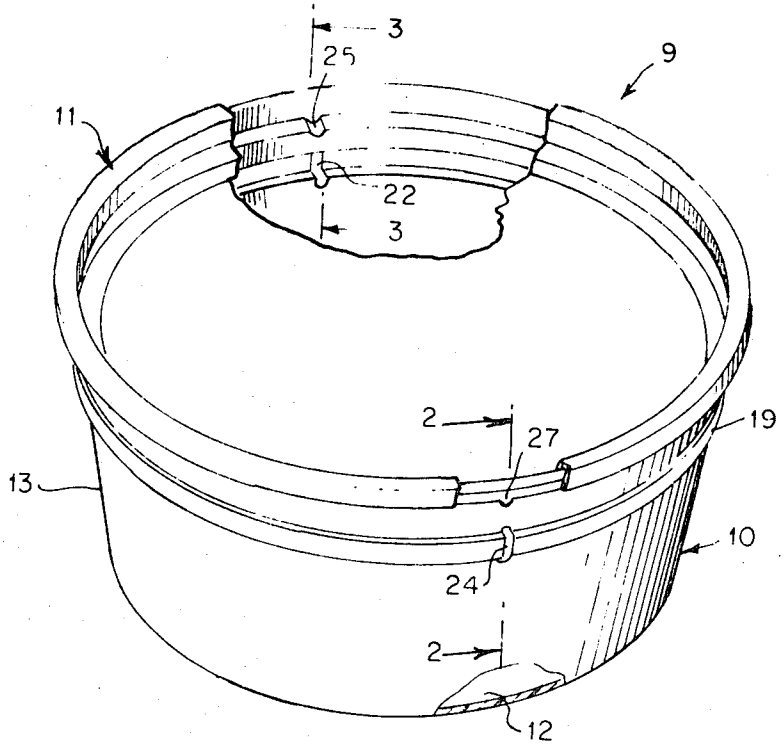
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ABSTRACT: A plurality of venting means are provided in an annular, radially outwardly directed channel in the sidewall of a plastic container permitting the egress of gases formed by the contained foodstuffs while preventing deformation of the snap-on plastic closure lid.



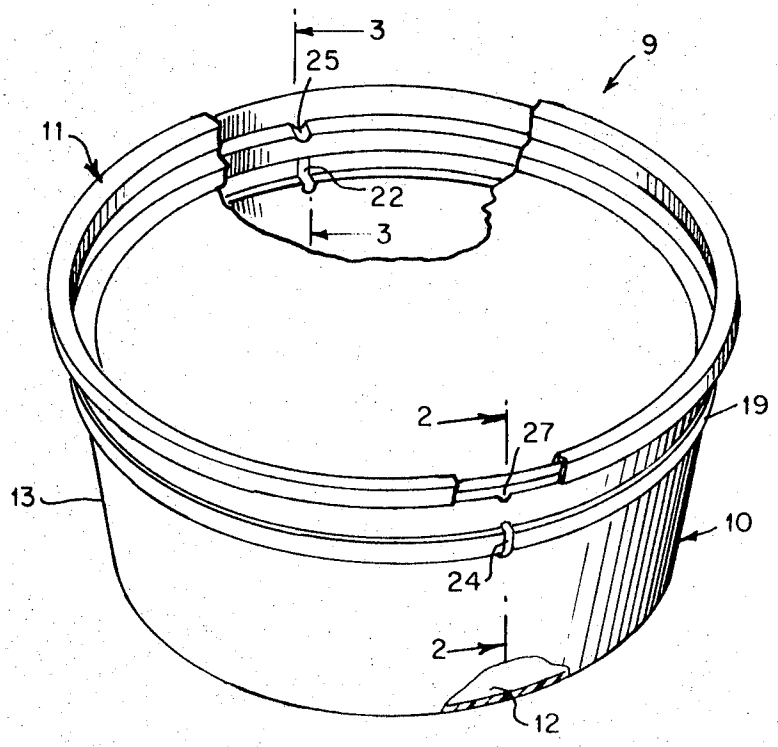


FIG. 1

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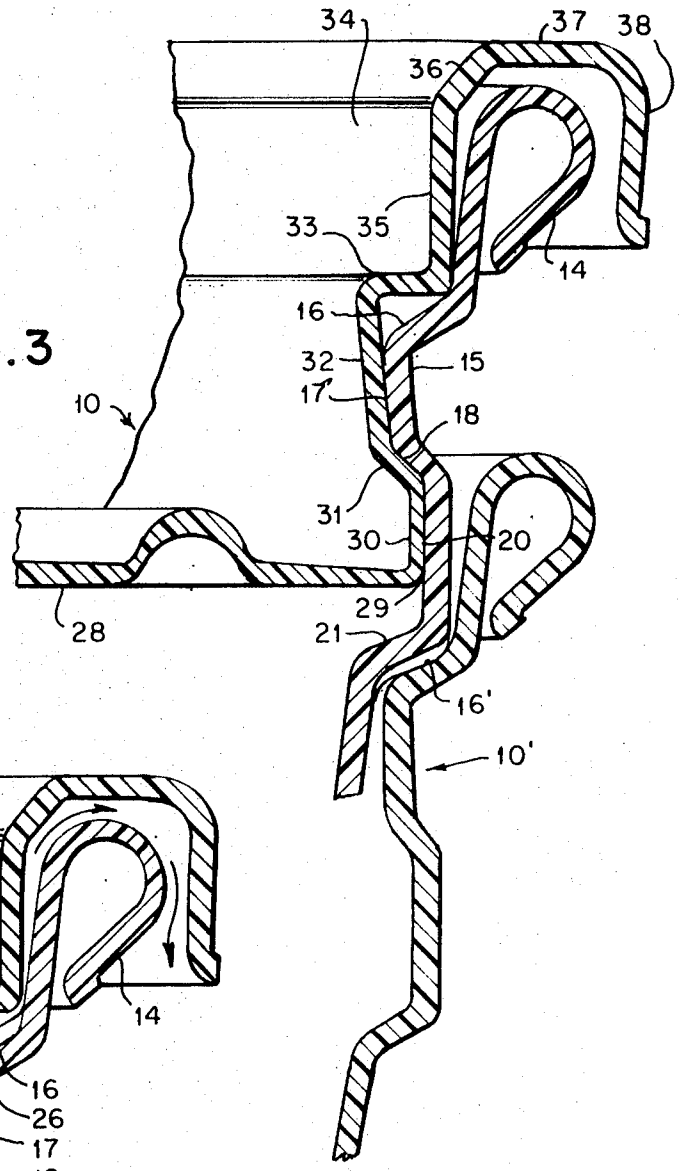


FIG. 3

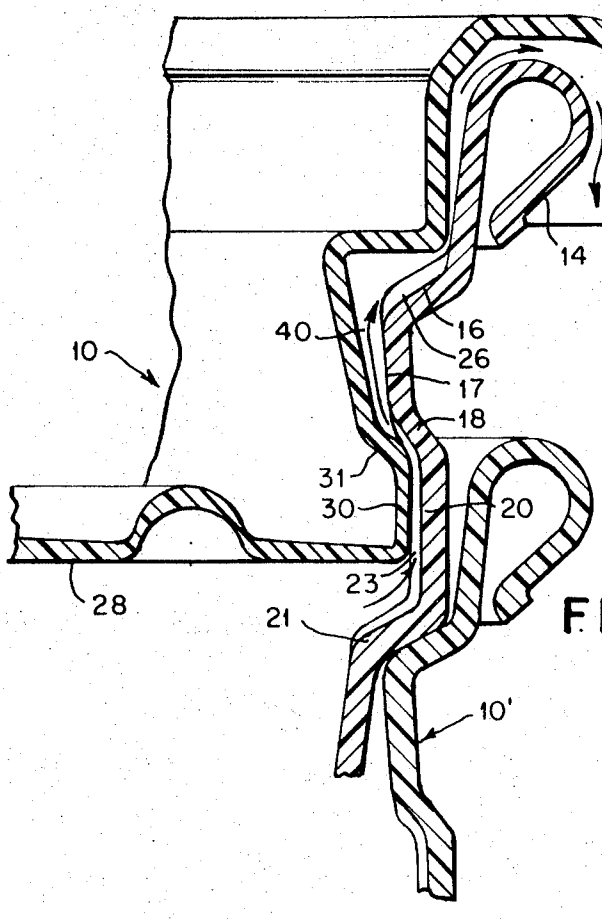


FIG. 2

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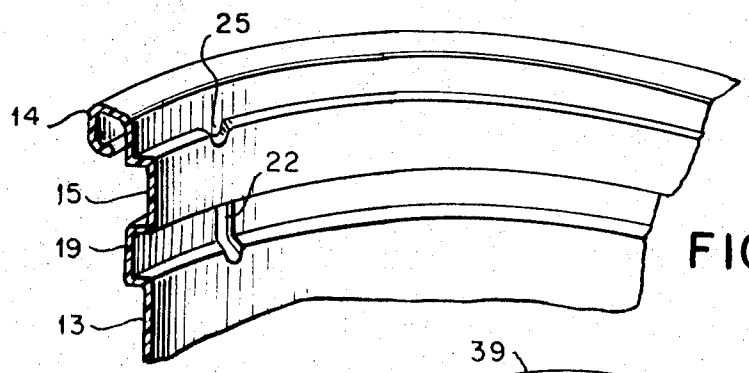


FIG. 4

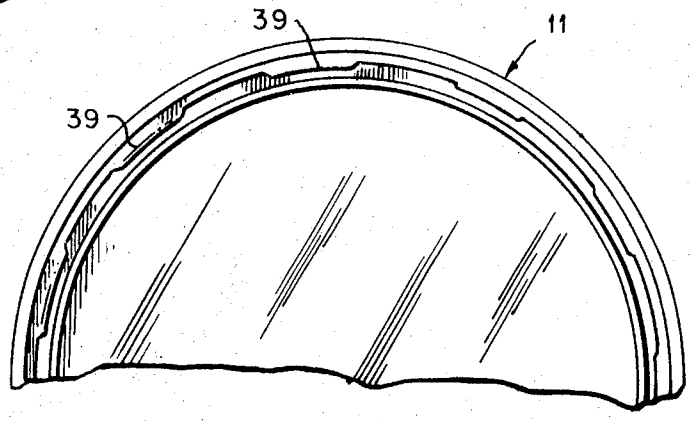
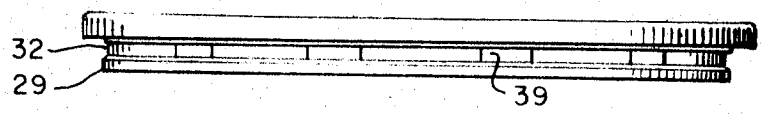


FIG. 6

FIG. 7



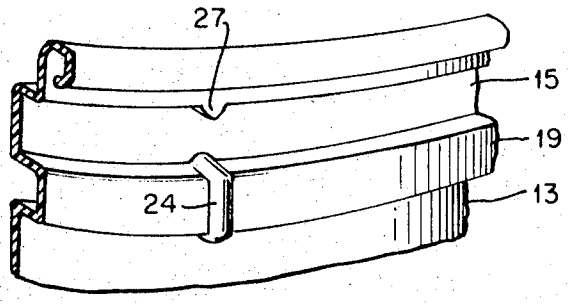


FIG. 5

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VENTED PACKAGE

The present invention relates to a plastic molded container for the packaging of foodstuffs, such as cottage cheese. More particularly, it relates to means for venting said filled container to permit the egress of gases while preventing deformation of the snap-on lid.

The difficulty with existing venting systems is that satisfactory venting depends upon maintaining very exact tolerances for both the thickness of the wall and the size of the seat for the lid bead. If these exacting tolerances are not achieved, either the venting means will be covered and closed off or the lid bead will fit too tightly in the bead seat to permit venting.

It is an object of the present invention to provide a novel venting system for plastic containers for foodstuffs.

It is another object of the present invention to provide novel venting means for a plastic container for foodstuffs to permit the egress of contained gases without distorting or deforming either the lid bead or the lid.

Other objects and advantages will be apparent from the following detailed description when taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a perspective view, with portions broken away, of the package of the present invention, consisting of a container and a closure lid affixed thereto;

FIG. 2 is a fragmentary sectional view taken along the line 2—2 of FIG. 1, along with a lower nested container, not shown in FIG. 1;

FIG. 3 is a fragmentary sectional view taken along the line 3—3 of FIG. 1, along with a lower nested container, not shown in FIG. 1;

FIG. 4 is a fragmentary perspective view of the interior of the container;

FIG. 5 is a fragmentary perspective view of the exterior of the container;

FIG. 6 is a fragmentary plan view of the closure lid; and

FIG. 7 is a side elevational view of the closure lid.

The package, generally indicated by the numeral 9, consists of a seamless plastic container 10, preferably of polystyrene, and a snap-on closure lid 11.

The container 10 consists of a bottom wall 12 and an upwardly and outwardly flaring sidewall 13 connected thereto. Sidewall 13 terminates in an outwardly curled lip portion 14 which defines an open end of said container 10.

In the sidewall 13 adjacent the open end of container 10 there is provided an annular, radially inwardly directed ring 15. Said ring 15, when viewed in cross section, consists of a downwardly and inwardly extending first ledge 16, at an angle of 30° or less from the vertical, which is connected to a first vertical land portion 17, which, in turn, is connected to a downwardly and outwardly extending second ledge 18.

Connected to ring 15 is an annular, radially outwardly directed channel or bead seat 19. Said channel 19 consists of said downwardly and outwardly extending second ledge 18, which is connected to a second vertical land portion 20, which is, in turn, connected to a downwardly and inwardly extending third ledge 21. Third ledge 21, like first ledge 16, is also at an angle of 30° or less from the vertical.

The interior circumference of bead seat or channel 19 is provided with a plurality of primary transverse grooves 22 which extend into third ledge 21, second land portion 20 and second ledge 18. Satisfactory venting can be achieved by providing a transverse groove solely in the second land portion alone, or in the second land portion and the second ledge. The provision of a transverse groove in third ledge 18 since it defines a rib or boss on the container's exterior is primarily to aid in stacking and nesting. The grooves 22 provide primary or first venting means 23, to be more fully discussed hereinafter. Grooves 22 appear on the exterior of the container as radial ribs or bosses 24.

Downwardly and inwardly extending first ledge 16 is provided with a plurality of secondary transverse grooves 25. These grooves 25 provide secondary or supplementary venting means 26 to be discussed more fully hereinafter. Grooves 25 are in alignment with grooves 22. Grooves 25 appear on the exterior of the container 10 as radial ribs or bosses 27.

The lid 11 consists of a circular, flat bottom portion 28 terminating at its periphery in an outwardly projecting annular sealing bead 29. Connected to sealing bead 29 is a short vertical leg 30 which, in turn, is connected to an angled shoulder portion 31. Shoulder 31 is connected to a generally vertical sidewall 32, which is connected to horizontal shoulder 33. Horizontal shoulder 33 is connected to a rim 34. Rim 34 consists of a vertically upstanding leg 35, which merges into a short angled leg 36, and then into a horizontal leg 37 which curves into a downwardly extending vertical leg or skirt 38. About the exterior circumference of lid sidewall 32 are a plurality of equally spaced inwardly inclined embossments 39, which define a plurality of outwardly canted voids 40 about the interior circumference of sidewalls 32, to be more fully discussed hereinafter.

As can be seen by reference to FIG. 2, which is a sectional view through primary grooves 22 and secondary grooves 25, the contained gases exit initially via primary venting means 23. Since the lid bead 29 does not contact second vertical land portion 20 and second ledge 18 at those points where grooves 22 are provided, preferably four equally spaced grooves 22 are provided, and since the bottom portion 28 of lid 11 extends only partially down into channel or beat seat 19 and never contacts third ledge 21, venting is achieved without distortion of sealing bead 29, even when said bead is firmly in place. It logically follows that venting is immediate and very little pressure is required to obtain the venting action, thus reducing the danger of lid popping or lid deformation.

As can be seen in FIG. 3, a seal is provided when the surfaces of first vertical land portion 17 of container 10 and the vertical portion of lid sidewall 32 are in abutting contact. A seal is also provided, as can be seen in FIG. 3, by a line contact at the upper end of first ledge 16 and horizontal shoulder 33 of lid 11. In order to allow for the passage of gases past first vertical land portion 17 and abutting vertical lid sidewall 32, the substantially vertical lid sidewall 32 is interrupted by providing a plurality of embossments 39 about its outer circumference thus defining about its interior circumference a plurality of outwardly canted voids 40, as can be seen in FIG. 2. To insure that at least one or more of these outwardly canted lid voids 40 are aligned with primary venting means 23, the recesses 22 in the container are an even number, preferably four, and the voids 40 in the lid are an odd number, preferably 11. The length of the voids in the lid are such that irrespective of how the lid is applied there will always be at least one primary venting means 23 and one lid void 40 in alignment to provide a passageway for the contained gases formed by the foodstuffs.

The point or line seal between first ledge 16 and horizontal lid shoulder 33 is relieved by the grooves 25 which define secondary venting means 26 in first ledge 16, as can be seen in FIG. 2. Thus, any gases rising to this level in the container, will distort the lid only a few thousandths of an inch and will vent to the atmosphere. This slight distortion in limited to the upper portion of the container only and does not disturb the mechanical lock of the lid bead in the bead seat or channel 19. Since the outer diameter of annular sealing bead 29 is slightly greater than the inner diameter of second land portion 20, good holding or locking of the lid to the container is achieved by virtue of an interference fit. The upper portion of first ledge 16 also serves to establish the degree of entry of the lid 11 into the container 10. In this fashion it performs the same function as the bottom of the lid seat does in current packages, without the close tolerances required in current packages.

As can be seen by reference to FIGS. 3 and 5, stacking is achieved by having that portion of radial boss 24 which is on third ledge 21 of container 10 resting upon a first ledge 16' of a lower nested container 10', rather than resting directly on the ledge. Therefore, the ledge of any one container in a stack of nested containers does not mate or overlap or rest upon the ledge of an adjacent upper or lower container. By nesting in this fashion the free movement of air between containers is facilitated and thus there is no possibility of a vacuum forming between the nested containers. Separation of the nested containers is, thus, readily achieved.

What is claimed is:

1. A seamless plastic container for foodstuffs and the like, which comprises:

a container having a bottom wall and an upwardly and outwardly flaring sidewall connected thereto;

said sidewall terminating in an outwardly curled lip portion defining an open end of said container adapted to receive a snap-on lid having an annular sealing bead about its periphery in closure-forming relationship;

an annular radially inwardly directed ring located adjacent said lip portion in said container sidewall, said ring being defined in radial cross section by a downwardly and inwardly extending first ledge, a first vertical land portion connected thereto, and a downwardly and outwardly extending second ledge connected to said first land portion;

an annular radially inwardly opening outwardly directed channel connected to said ring, said channel being defined in radial cross section by said downwardly and outwardly extending second ledge, a second vertical land portion connected thereto, and a downwardly and inwardly extending third ledge connected to said second land portion;

said second land portion being provided with a plurality of transversed grooves spaced about its circumference, said grooves defining a plurality of primary venting means which permit the egress of gases formed by the contained foodstuffs while said sealing bead, which is of slightly greater diameter than the inner diameter of said second land portion, is maintained in snap-on closure-forming contact with said second land portion.

2. The container as recited in claim 1 wherein said transverse grooves in said second land channel which define said primary venting means extend into said second and third ledges of said channel.

3. The container as recited in claim 1 and including a plurality of transverse grooves in said first ledge of said ring defining supplementary venting means, said grooves in said first ledge being aligned with said grooves in said second land portion.

4. The container as recited in claim 1 wherein said lid has a generally vertical sidewall portion, said vertical sidewall being interrupted by a plurality of embossments about its outer circumference thus defining a plurality of outwardly canted voids about its inner circumference whereby a plurality of passageways for the egress of contained gases are formed between said lid sidewall and said first land portion of said container.