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(54) **HIGH-TEMPERATURE BARRIER PACKAGE**

Publication Classification

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(52) **U.S. Cl.** **220/359.2; 220/359.1**

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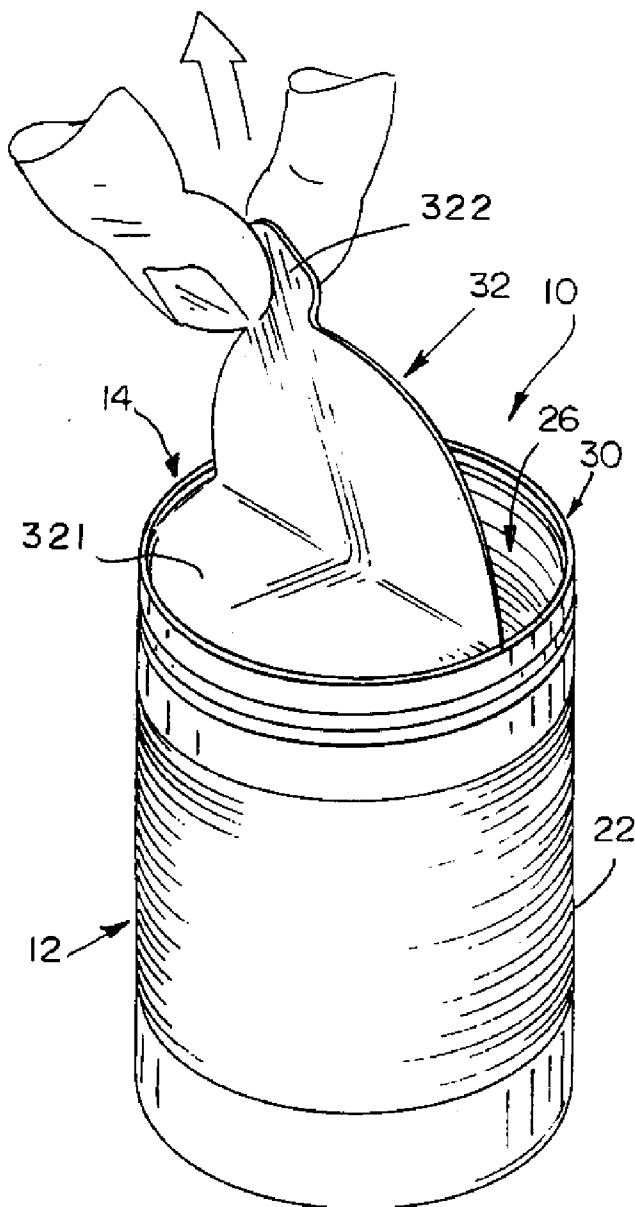
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(57) **ABSTRACT**

Related U.S. Application Data

(60) Provisional application No. 61/452,534, filed on Mar. 14, 2011.

A package includes a container and a lid. The package is configured to endure exposure to high sterilization temperatures.



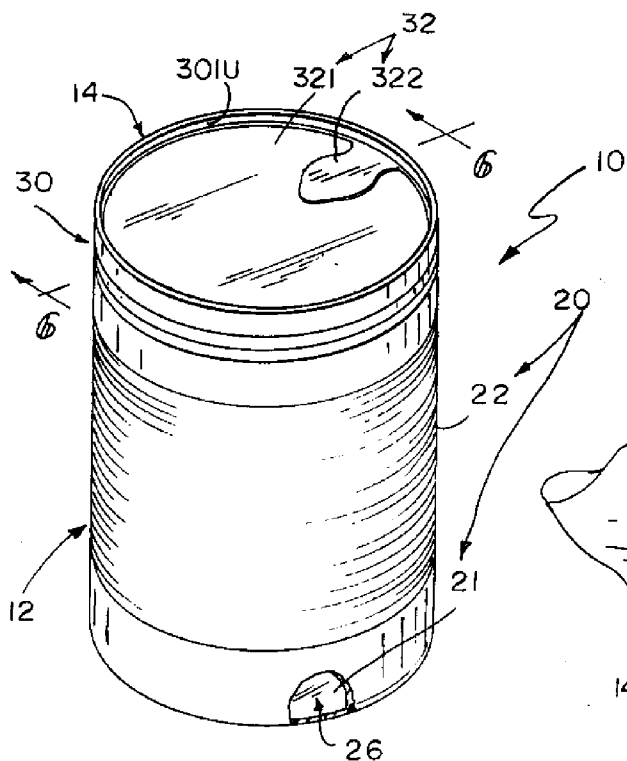


FIG. 1

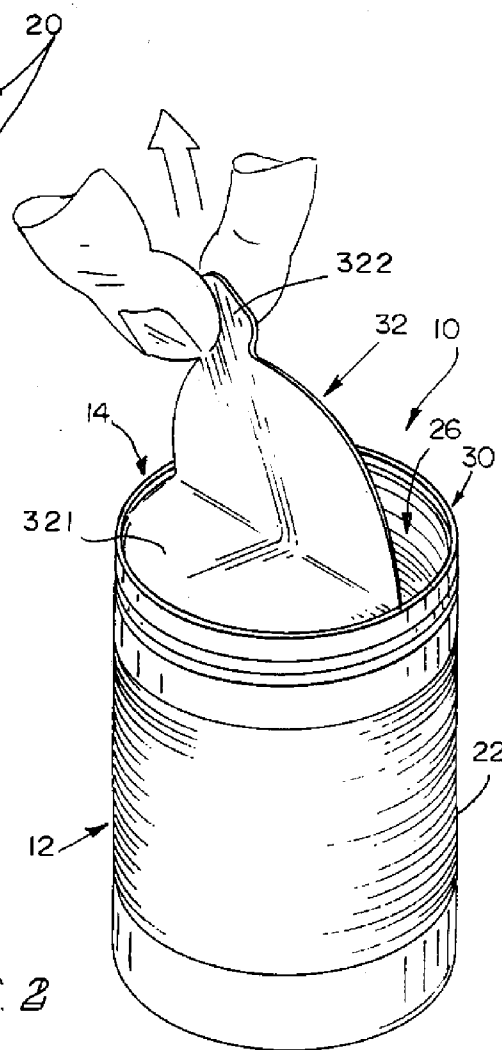


FIG. 2

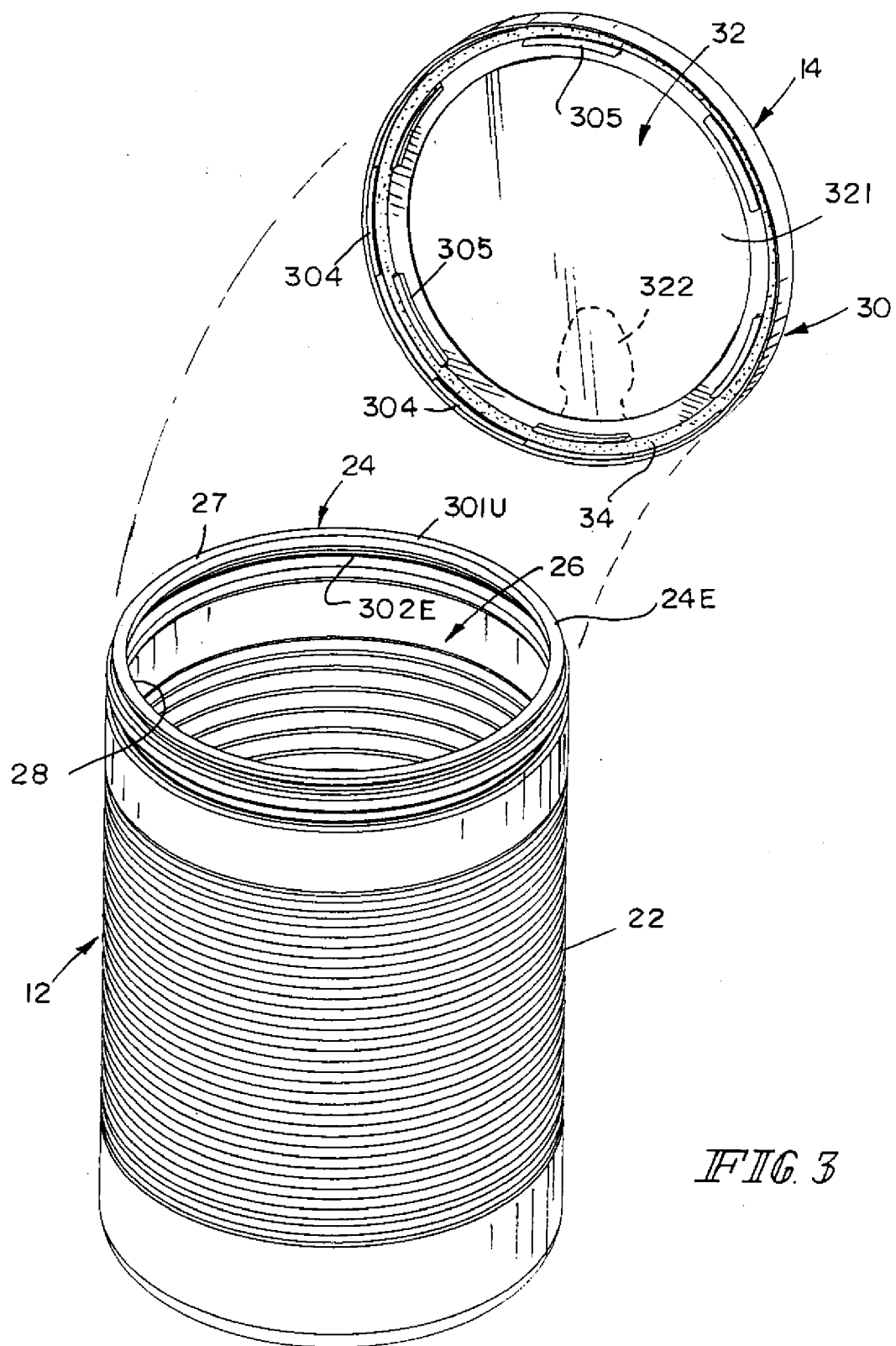


FIG. 3

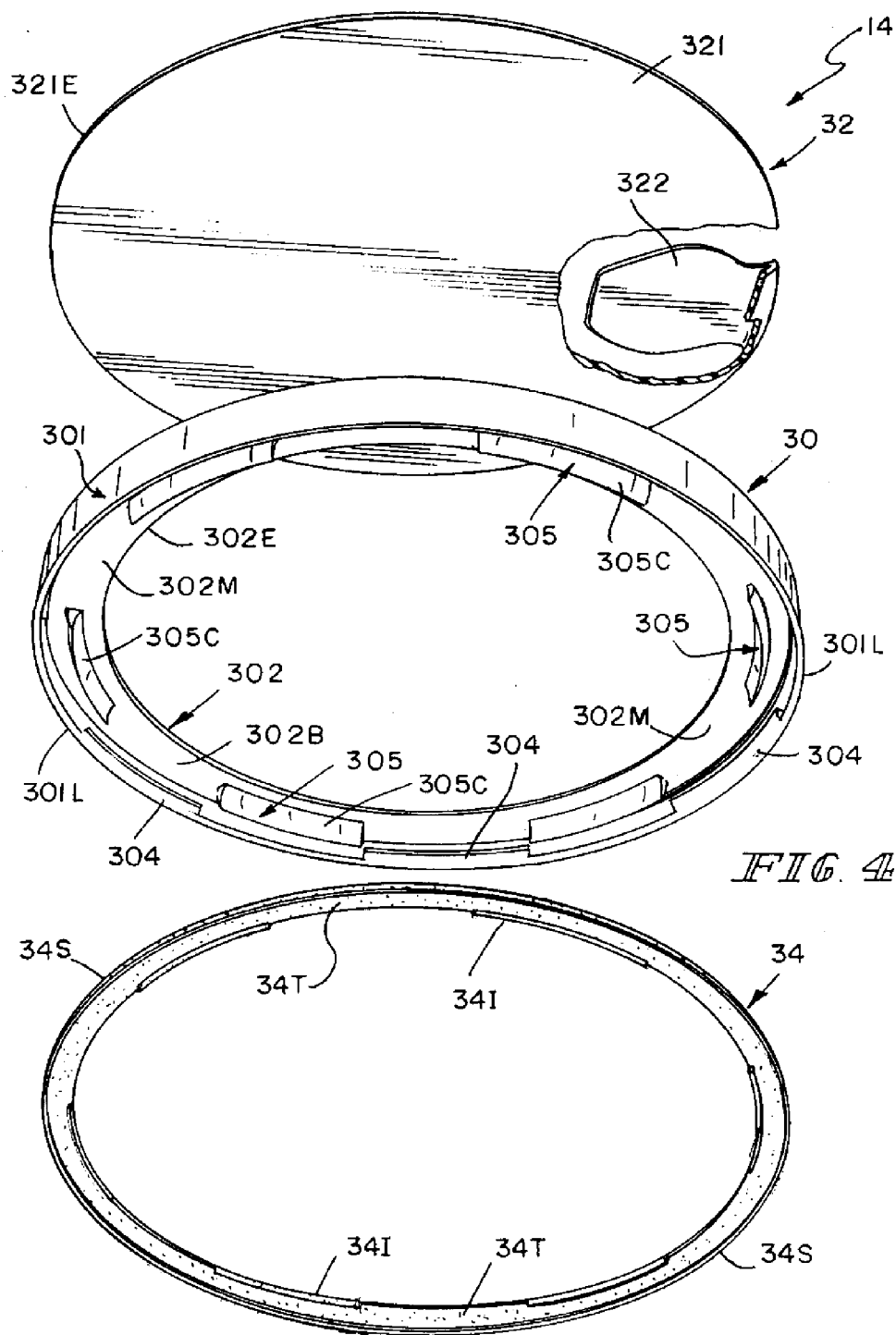


FIG. 4

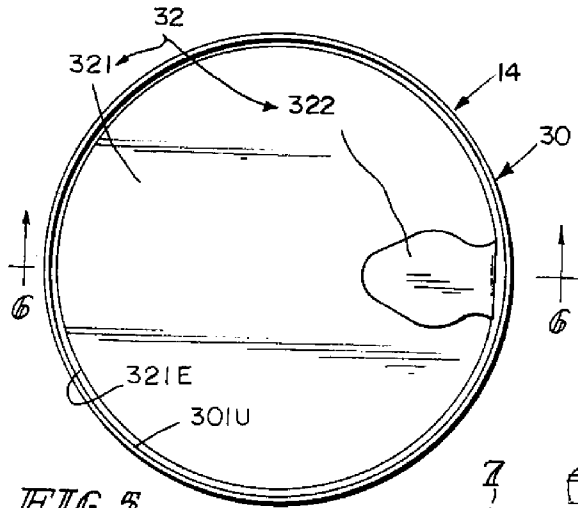


FIG. 5

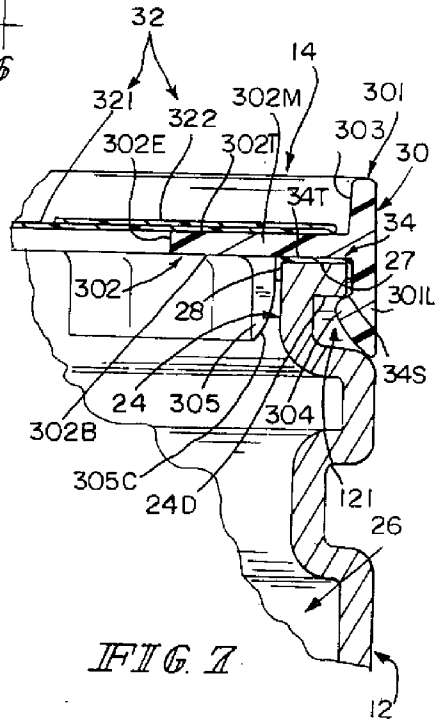


FIG. 7

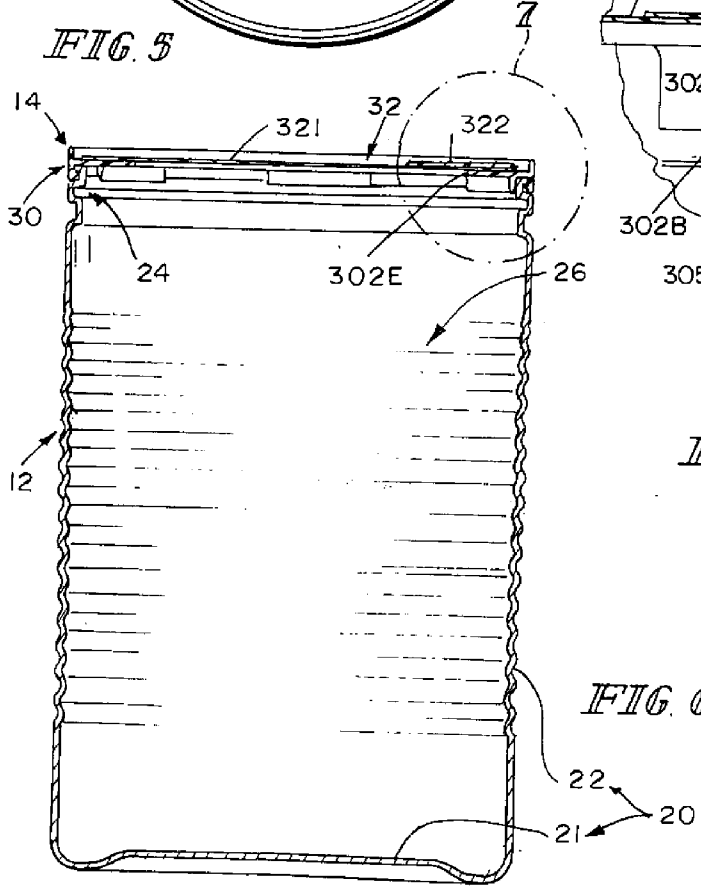


FIG. 6

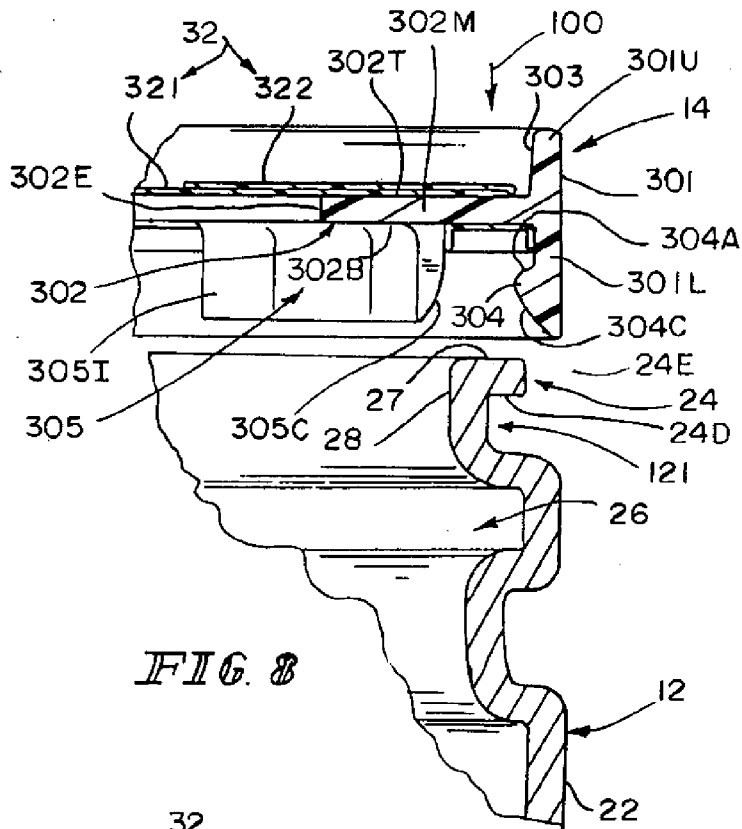


FIG. 8

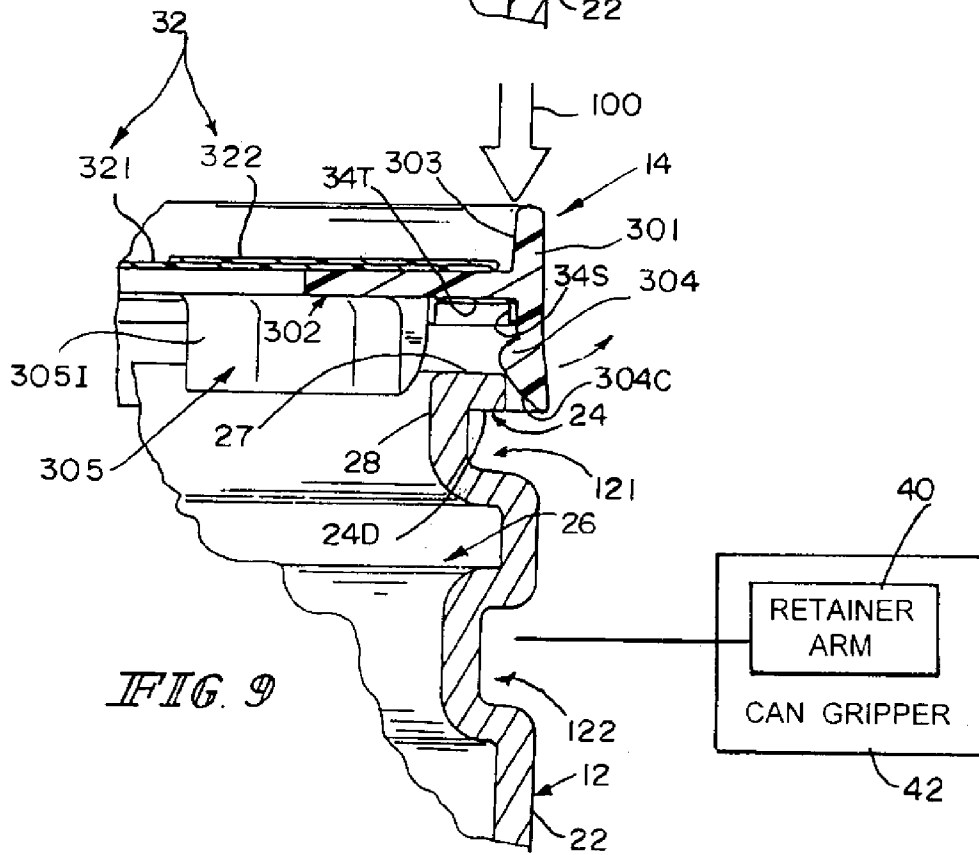


FIG. 9

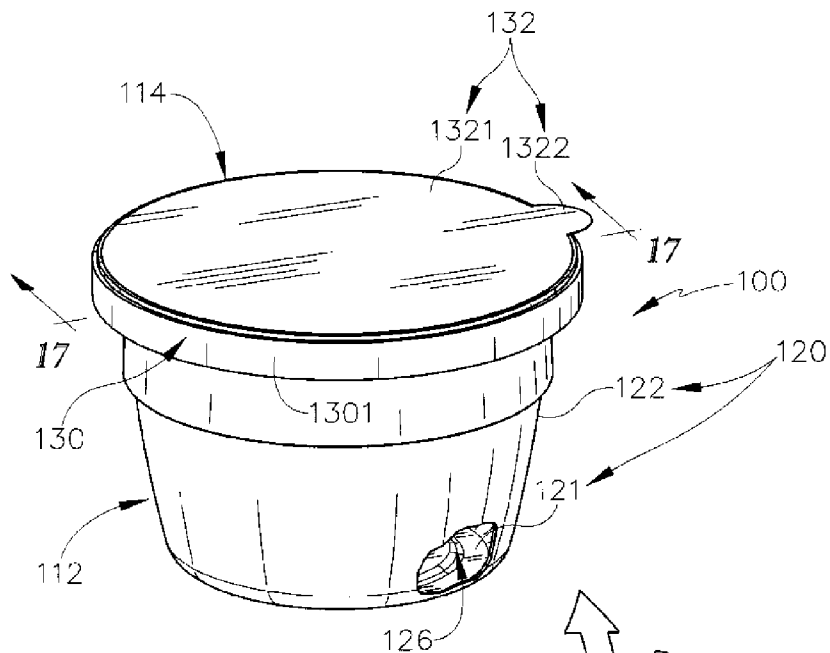


FIG. 12

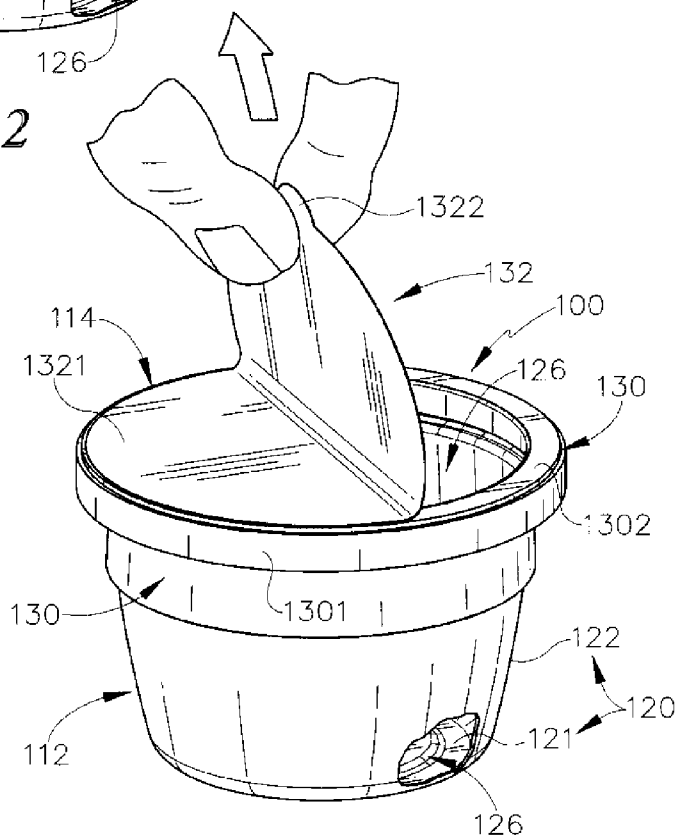


FIG. 13

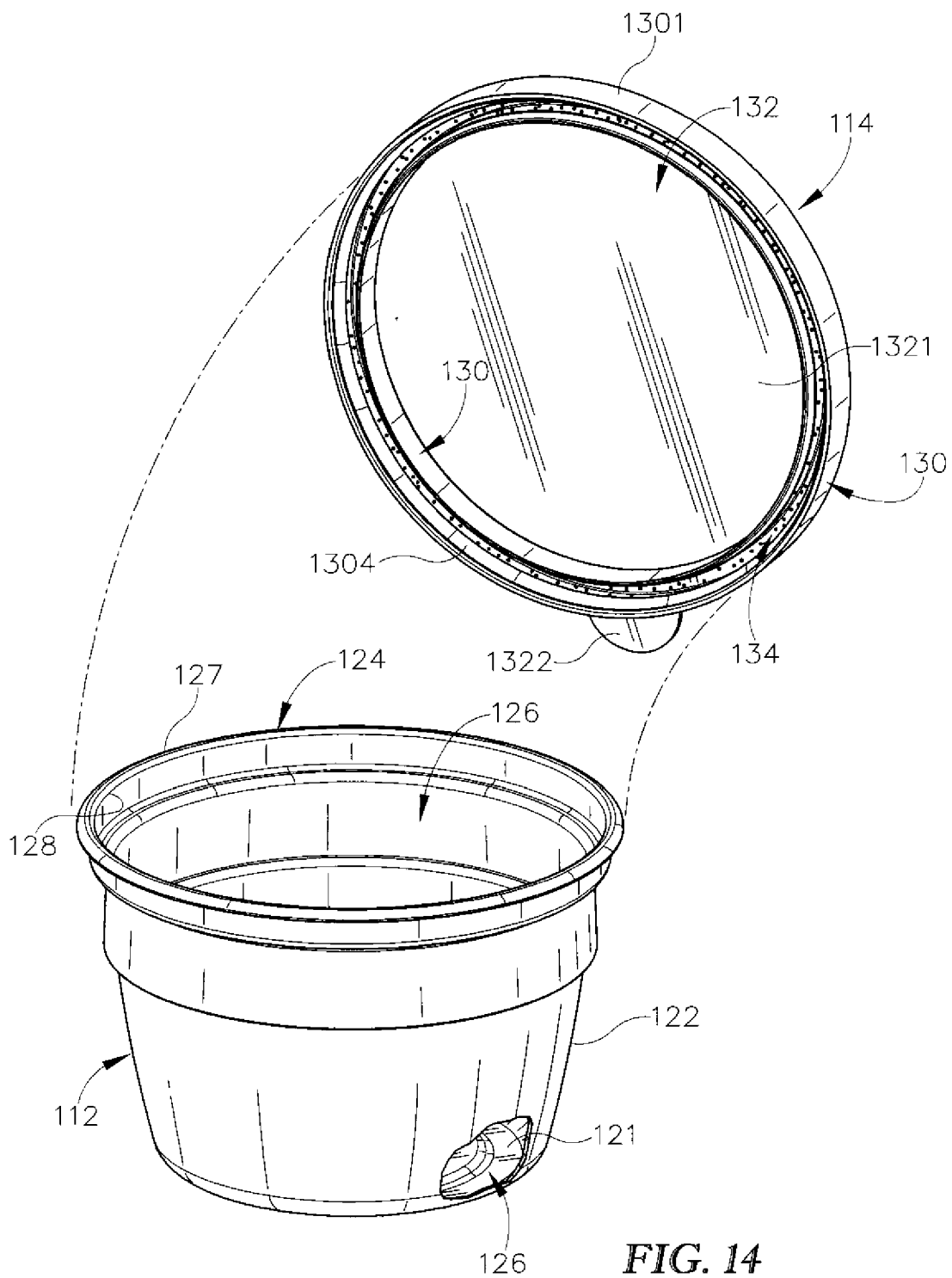


FIG. 14

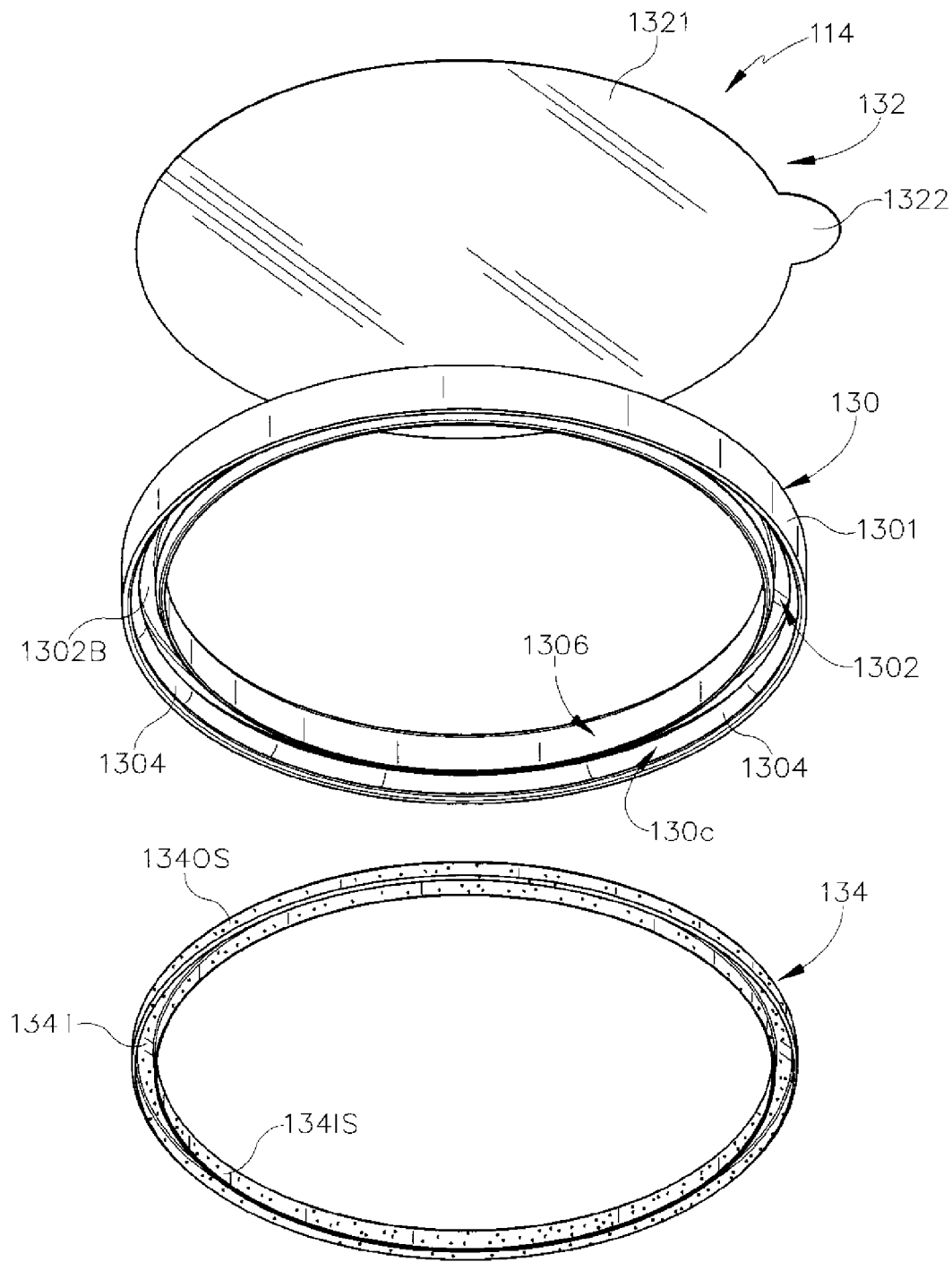


FIG. 15

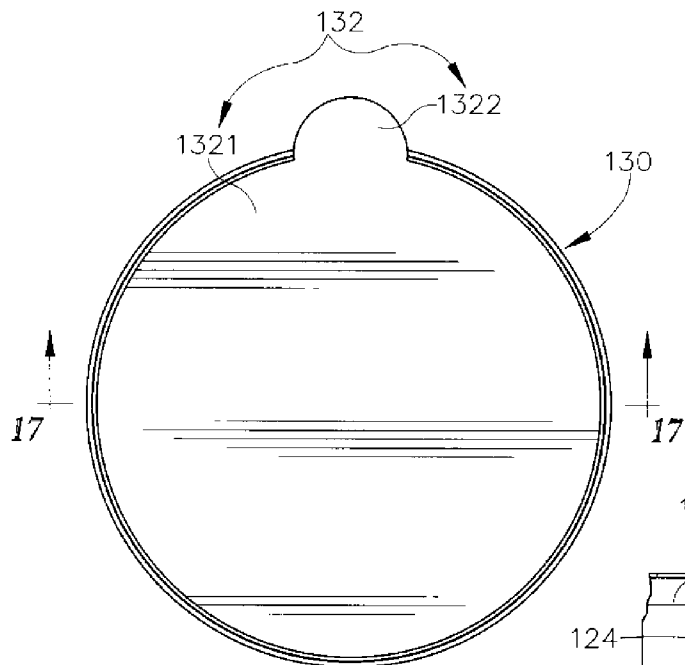


FIG. 16

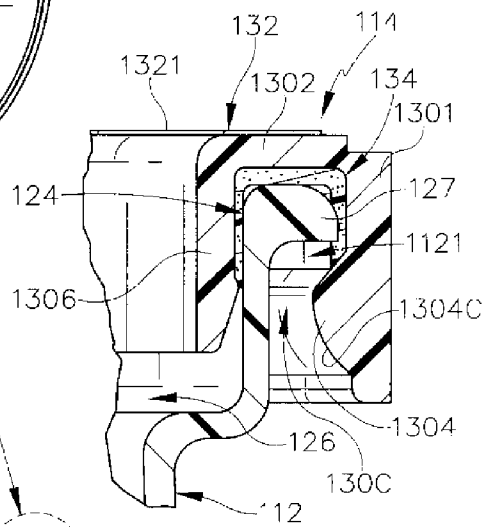


FIG. 18

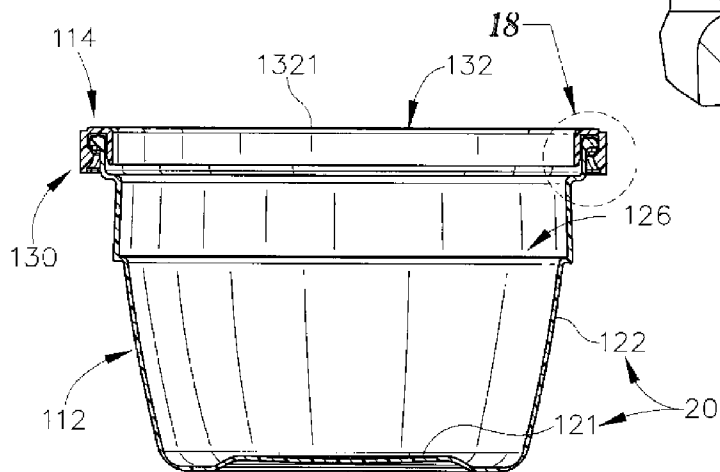


FIG. 17

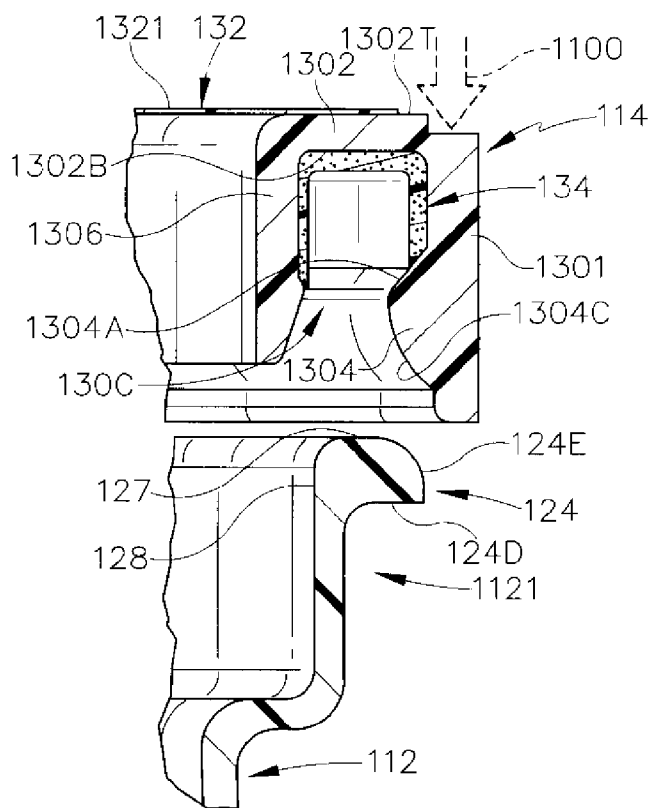


FIG. 19

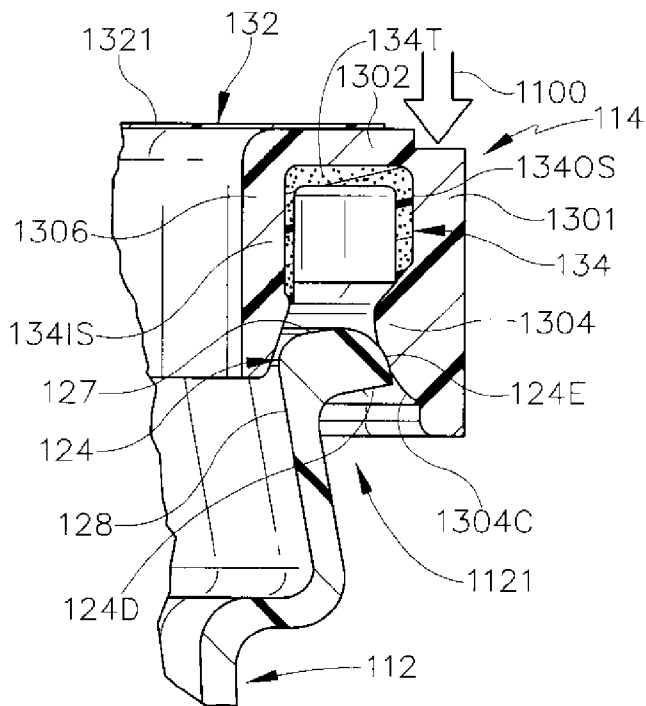


FIG. 20

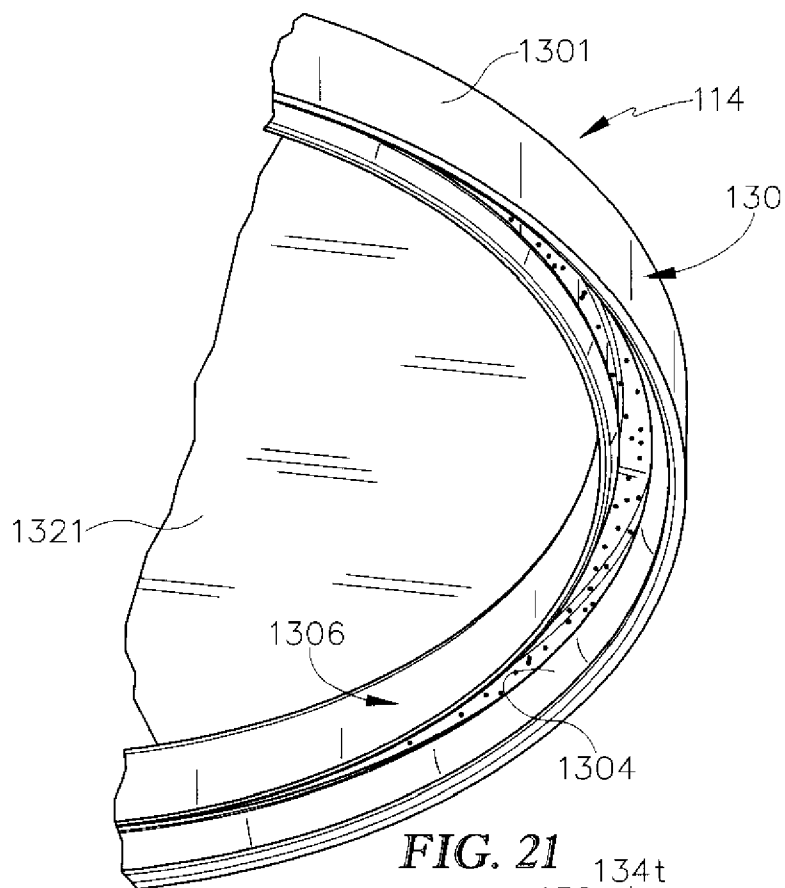


FIG. 21

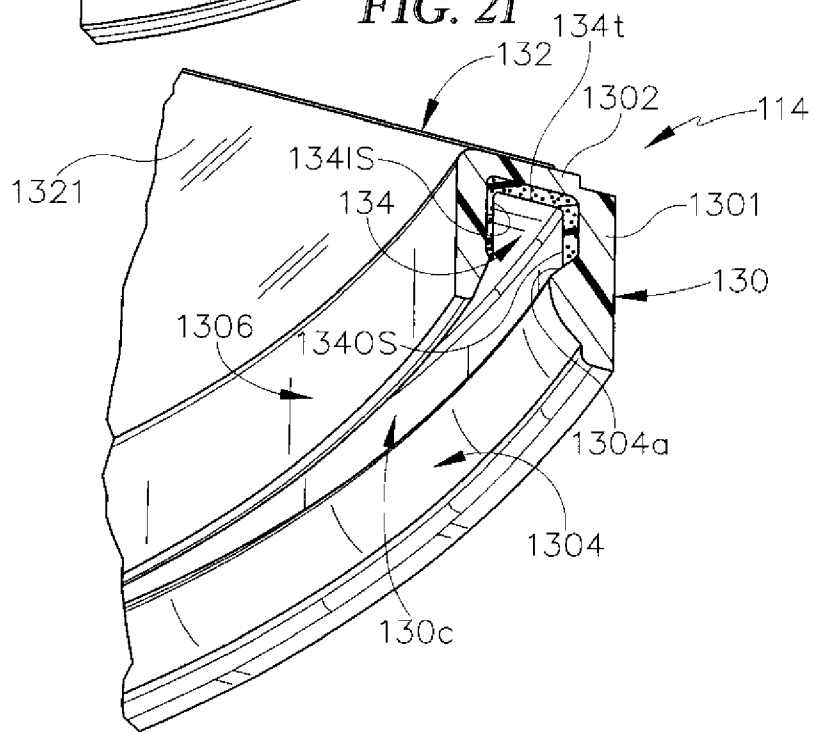


FIG. 22

HIGH-TEMPERATURE BARRIER PACKAGE**PRIORITY**

[0001] This application claims priority under 35 U.S.C. §119(e) to U.S. Provisional Application Ser. No. 61/452,534, filed Mar. 14, 2011, which is expressly incorporated by reference herein.

BACKGROUND

[0002] The present disclosure relates to a package, and in particular to a package including a container and a lid for the container. More particularly, the present disclosure relates to a package that can survive exposure to high temperatures.

SUMMARY

[0003] A lid in accordance with the present disclosure is adapted to close an aperture opening into an interior region of a container. The lid is adapted to mate with a brim of the container to cover the interior region formed in the container.

[0004] In illustrative embodiments, the lid includes a removable closure including a membrane sheet and a pull tab coupled to the membrane sheet, a sheet-support ring adapted to mount on the brim of the container and carry the membrane sheet of the removable closure, and a brim seal trapped between the sheet-support ring and the container brim when the lid is mounted on the container. The sheet-support ring mates permanently with the container brim.

[0005] In illustrative embodiments, each of the container, the sheet-support ring, and the removable closure is made of a plastics material. Those elements cooperate with the brim seal (also made of a plastics material) to provide means for retaining product stored in the interior region of the container in a sealed chamber during exposure of the package to high package-sterilization temperatures until a peelable membrane sheet included in the removable closure is separated manually by a consumer from the sheet-support ring to provide an access opening into the interior region of the container.

[0006] A consumer can access product stored in the container by separating the peelable membrane sheet from the sheet-support ring using a pull tab coupled to the peelable membrane sheet to expose a central ring aperture formed in the sheet-support ring to open into the interior region formed in the container. In illustrative embodiments, each of the brim and the sheet-support ring has a round shape. It is within the scope of the present disclosure to use any suitable shape.

[0007] In illustrative embodiments, a package in accordance with the present disclosure is made entirely of plastics material. The package is configured to seal contents under high temperature and high pressure sterilization and microwave cooking and does not allow transmission of oxygen or moisture.

[0008] Additional features of the present disclosure will become apparent to those skilled in the art upon consideration of illustrative embodiments exemplifying the best mode of carrying out the disclosure as presently perceived.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The detailed description particularly refers to the accompanying figures in which:

[0010] FIG. 1 is a perspective view of a package in accordance with a first embodiment of the present disclosure showing a lid that has been mounted on an underlying container

during a lid installation process at a factory (as suggested in a sequence shown in FIGS. 8, 9, and 7) to close an aperture opening into an interior region formed in the container;

[0011] FIG. 2 is a perspective view similar to FIG. 1 showing that a removable closure included in the lid and coupled to an underlying sheet-support ring also included in the lid and coupled permanently to the brim of the container as suggested in FIG. 7 can be removed by a consumer to gain access to product stored in the interior region of the container without removing the sheet-support ring from the container brim;

[0012] FIG. 3 is an exploded perspective assembly view of the components of the package of FIG. 1 and showing the lid before the sheet-support ring of the lid is mounted on the brim of the container;

[0013] FIG. 4 is an exploded perspective assembly view of components of the lid of FIG. 1 showing, in series, from top to bottom, a removable closure including a peelable membrane sheet and a pull tab coupled to the peelable membrane sheet, a sheet-support ring adapted to mate permanently with the brim of the container during a lid-installation process at a factory as suggested in FIG. 3 and carry the peelable membrane sheet of the removable closure as suggested in FIG. 2, and an annular brim seal configured to mate with the sheet-support ring and lie in an annular seal-receiving channel formed in the sheet-support ring to face downwardly toward the brim of the container as suggested in FIG. 3;

[0014] FIG. 5 is a top plan view of the package of FIG. 1;

[0015] FIG. 6 is a sectional view of the package taken along line 6-6 of FIGS. 1 and 5;

[0016] FIG. 7 is an enlarged sectional view of the package taken from the circled region of FIG. 6 showing mating engagement of the sheet-support ring of the lid and the underlying brim of the container to trap the annular brim seal therebetween and showing the peelable membrane sheet of the closure adhered to a top side of an inner rim included in the sheet-support ring;

[0017] FIGS. 8, 9, and 7 cooperate, in series, to show how the lid shown in FIG. 3 is press-fit onto the brim of the container to close the container and establish a sealed package that is made of plastics materials and can survive exposure to high temperatures during a package sterilization process and a microwave cooking process;

[0018] FIG. 8 shows sectional views of a portion of the lid of FIG. 3 before it is mated with a portion of the underlying container;

[0019] FIG. 9 is similar to FIG. 8 and shows the downwardly moving lid of FIG. 3 in contact with the brim of the container during camming engagement of one of the elastic lid-retention lugs included in the sheet-support ring and a perimeter edge of the container brim and before that lid-retention lug snaps into a lug-receiving radially outwardly opening undercut space (e.g., channel) formed in a side wall of the container under the brim as suggested in FIG. 7;

[0020] FIG. 10 is an enlarged perspective view of a portion of the lid of FIG. 3 showing some of the spaced-apart arc-shaped inner rim segments and some of the arc-shaped outer lid-retention lugs included in the sheet-support ring and showing a portion of the annular brim seal located in a downwardly opening annular channel formed in the sheet-support ring to lie in an annular space provided between the arc-shaped inner rim segments and outer lid-retention lugs;

[0021] FIG. 11 is another enlarged perspective view of a portion of the lid of FIG. 3 showing that a portion of the annular brim seal has an L-shaped cross-section in the embodiment of FIGS. 1-11;

[0022] FIG. 12 is a perspective view of a package in accordance with a second embodiment of the present disclosure showing a lid that has been mounted on an underlying container during a lid installation process at a factory (as suggested in a sequence shown in FIGS. 19, 20, and 18) to close an aperture opening into an interior region formed in the container;

[0023] FIG. 13 is a perspective view similar to FIG. 12 showing that a removable closure included in the lid and coupled to an underlying sheet-support ring also included in the lid and coupled permanently to the brim of the container as suggested in FIG. 18 can be removed by a consumer to gain access to product stored in the interior region of the container without removing the sheet-support ring from the container brim;

[0024] FIG. 14 is an exploded perspective assembly view of the components of the package of FIG. 12 and showing the lid before the sheet-support ring of the lid is mounted on the brim of the container;

[0025] FIG. 15 is an exploded perspective assembly view of components of the lid of FIG. 1 showing, in series, from top to bottom, a removable closure including a peelable membrane sheet and a pull tab coupled to the peelable membrane sheet, a sheet-support ring adapted to mate permanently with the brim of the container during a lid-installation process at a factory as suggested in FIG. 14 and carry the peelable membrane sheet of the removable closure as suggested in FIG. 13, and an annular brim seal configured to mate with the sheet-support ring and lie in an annular channel formed in the sheet-support ring to face downwardly toward the brim of the container as suggested in FIG. 14;

[0026] FIG. 16 is a top plan view of the package of FIG. 12;

[0027] FIG. 17 is a sectional view of the package taken along line 17-17 of FIGS. 12 and 16;

[0028] FIG. 18 is an enlarged sectional view of the package taken from the circled region of FIG. 17 showing mating engagement of the sheet-support ring of the lid and the underlying brim of the container to trap the annular brim seal therebetween and showing the peelable membrane sheet of the closure adhered to a top side of an inner rim included in the sheet-support ring;

[0029] FIGS. 19, 20, and 18 cooperate, in series, to show how the lid shown in FIG. 14 is press-fit onto the brim of the container to close the container and establish a sealed package that is made of plastics materials and can survive exposure to high temperatures during a package sterilization process and a microwave cooking process;

[0030] FIG. 19 shows sectional views of a portion of the lid of FIG. 14 before it is mated with a portion of the underlying container;

[0031] FIG. 20 is similar to FIG. 19 and shows the downwardly moving lid of FIG. 14 in contact with the brim of the container during camming engagement of the elastic annular lid-retention lug included in the sheet-support ring and a perimeter edge of the container brim and before that lid-retention lug snaps into a lug-receiving radially outwardly opening undercut space formed in a side wall of the container under the brim as suggested in FIG. 18;

[0032] FIG. 21 is an enlarged perspective view of a portion of the lid of FIG. 14 showing a portion of the annular brim seal

located in a downwardly opening annular channel formed in the sheet-support ring to lie in an annular space provided between the arc-shaped inner rim segments and outer lid-retention lugs; and

[0033] FIG. 22 is another enlarged perspective view of a portion of the lid of FIG. 14 showing that the annular brim seal has a U-shaped cross section in the embodiment of FIGS. 12-22.

DETAILED DESCRIPTION

[0034] A package 10 in accordance with a first embodiment of the present disclosure includes a container 12 and a lid 14 configured to mount on container 12 as suggested in FIGS. 1 and 3. In illustrative embodiments, each of container 12 and lid 14 is comprised only of plastics materials that can survive exposure to high temperatures associated with, for example, a package heating or sterilization process.

[0035] Lid 14 includes several components made of plastics materials. These components include a sheet-support ring 30, a removable closure 32, and an annular brim seal 34 as shown in FIG. 4. Lid 14 is mounted on container 12 at a factory after container 12 is filled as suggested in a series of sectional views provided in FIGS. 8, 9, and 7.

[0036] Container 12 includes a floor 21 and a side wall 22 extending upwardly from a perimeter edge of floor 21 and terminating at a brim 24 as shown, for example, in FIGS. 3 and 6. Floor 21 and side wall 22 cooperate to form an interior product-storage region 26 in container 12. Brim 24 includes an upwardly facing endless seal-receiving surface 27 and is formed to include an inner edge 28 defining a brim aperture opening into product-storage region 26 formed in container 12 as suggested in FIGS. 3 and 8. It is within the scope of this disclosure to provide container 12 with any suitable size and shape.

[0037] Lid 14 includes a sheet-support ring 30 configured to mount permanently on brim 24 of container 12 during a lid-installation process, a removable closure 32 configured to mount temporarily on sheet-support ring 30 until it is removed by a consumer to gain access to product-storage region 26, and an annular brim seal 34 provided on the underside of sheet-support ring 30 as shown, for example, in FIGS. 3 and 4. When lid 14 is mounted on container 12 at a factory as suggested in FIGS. 1 and 6, (1) sheet-support ring 30 is coupled permanently to annular container brim 24 and (2) annular brim seal 34 is trapped between sheet-support ring 30 and container brim 24 to establish a sealed connection therebetween.

[0038] Removable closure 32 includes a peelable membrane sheet 321 and a pull tab 322 coupled to peelable membrane sheet 321 in an illustrative embodiment as suggested in FIGS. 1, 2, and 4. A consumer can gain access to product stored in product-storage region 26 formed in container 12 by separating removable closure 32 from sheet-support ring 30 as suggested in FIG. 2. In an illustrative embodiment, the consumer grips and pulls upwardly on pull tab 322 to cause peelable membrane sheet 321 to be peeled away from sheet-support ring 30 as suggested in FIG. 2. Removable closure 32 is made of a plastics material able to withstand exposure to high temperatures associated with package sterilization or cooking. Removable closure 32 can fracture to provide easy peel.

[0039] Sheet-support ring 30 has a size and shape selected to match and mate with container brim 34. Sheet-support ring 30 is round in the illustrated embodiment. It is within the

scope of this disclosure to provide sheet-support ring 30 with a rectangular, square, oval, or other suitable shape selected to mate with a companion container brim.

[0040] Annular brim seal 34 is sized to lie in a fixed position in a downwardly opening channel formed in sheet-support ring 34 as suggested in FIGS. 4, 10, and 11. A portion of annular brim seal 34 has an L-shaped cross section in an illustrative embodiment as shown in FIGS. 7 and 11.

[0041] Sheet-support ring 30 includes an axially extending annular outer wall 301 and a radially inwardly extending endless inner rim 302 coupled to an inwardly facing surface 303 of annular outer wall 301 as suggested in FIGS. 4, 7, and 11. Sheet-support ring 30 also includes a series of outer lid-retention lugs 304 coupled to a lower portion 301L of outer wall 301 and a series of inner rim segments 305 coupled to a middle portion 302M of radially inwardly extending endless inner rim 302 as suggested in FIGS. 4, 10, and 11. Sheet-support ring 30 is made of a crystallized polyethylene terephthalate (CPET) material that is able to provide a high-temperature barrier in an illustrative embodiment. It is within the scope of this disclosure to provide sheet-support ring 30 with any suitable round or non-round shape.

[0042] Annular outer wall 301 of sheet-support ring 30 also includes an annular upper portion 301U coupled to lower portion 301L and arranged to extend upwardly above inner rim 302 of sheet-support ring 30 as shown, for example, in FIG. 11. Annular upper portion 301U is arranged to extend around an outer perimeter edge 321E of peelable membrane sheet 321 when peelable membrane sheet 321 is coupled to inner rim 302 as suggested in FIGS. 1 and 11. In an illustrative embodiment, the six inner rim segments 305 coupled to radially inwardly extending endless inner rim 302 are arranged to lie in spaced-apart relation to the surrounding lower portion 301L of annular outer wall 301 to locate annular brim seal 34 therebetween as suggested in FIGS. 4, 10, and 11.

[0043] Inner rim 302 of sheet-support ring 30 includes a radially outer portion coupled to annular outer wall 301 and a radially inner edge 302E formed to define a ring aperture opening into the product-storage region 26 formed in container 12 as shown, for example, in FIGS. 3, 6, and 7. Inner rim 302 includes a top surface 302T coupled to a downwardly facing surface of membrane sheet 321 as shown, for example, in FIGS. 7 and 11. Membrane sheet 321 can be welded to top surface 302T of inner rim 302 during molding. Inner rim 302 also includes a bottom surface 302B coupled to an upwardly facing surface of annular brim seal 34 as also suggested in FIGS. 7 and 11.

[0044] Outer lid-retention lugs 304 cooperate to provide means for gripping container 12 (e.g., an outer portion of container brim 24) to retain sheet-support ring 30 in a stationary, mounted position on container brim 24 as suggested in FIGS. 6 and 7. An illustrative example of mating engagement of lid-retention lugs 304 and container brim 24 during mounting of lid 14 onto container 12 is shown in FIGS. 8, 9, and 7.

[0045] Each outer lid-retention lug 304 includes an inclined cam ramp 304C for riding on an outer edge 24E of container brim 24 during downward movement of lid 14 in direction 100 toward container 12 during a lid-mounting process at a factory as suggested in FIGS. 8 and 9. Elastic properties of the plastics material used to form annular outer wall 301 allows elastic flexure of lower portion 301L as suggested in FIG. 9 so that each lid-retention lug 304 can snap into a radially outwardly opening undercut space 121 (of any suitable size and shape) formed in container 12 underneath brim 24 to place an

anchor face 304A of lid-retention lug 304 in confronting relation with a downwardly facing surface 24D on the underside of container brim 24 as shown, for example, in FIG. 7 once lid 14 is moved far enough in downward direction 100 to trap annular brim seal 34 between inner rim 302 of sheet-support ring 30 and container brim 24.

[0046] Outer lid-retention lugs 304 are, for example, circumferentially spaced apart about the circumference of lower portion 301L of side wall 301 as suggested in FIG. 4. Each outer lid-retention lug 104 is arc-shaped along its length as suggested in FIG. 4.

[0047] Inner rim segments 305 cooperate to provide means for engaging an inner edge 24E of container brim 24 during downward movement of lid 14 in downward direction 100 toward mating engagement with container 12 so that lid 14 is located in a centered position relative to container 12 to cause lid-retention lugs 304 (to extend into the radially outwardly opening annular undercut space 121 formed in container 12 in an illustrative embodiment) to mate with downwardly facing surface 24D of container brim 24 as suggested, in sequence, in FIGS. 8, 9, and 7. A series of inner rim segments 305 are provided on the underside of inner rim 302 of sheet-support ring 30 as shown, for example, in FIGS. 4 and 10.

[0048] Each inner rim segment 305 includes (on one side) a curved radially outwardly facing locator-cam surface 305C facing toward inner edge 24E of container brim 24 as shown, for example, in FIGS. 7-9 and (on an opposite side) an inner surface 305I facing radially inwardly toward a central axis of sheet-support ring 30 as suggested in FIG. 11. The inner rim segments 305 are, for example, circumferentially spaced apart as suggested in FIG. 3. Each inner rim segment is arc-shaped along its length as suggested in FIG. 4.

[0049] Annular brim seal 34 includes a top seal wall 34T and an outer side seal wall 34S coupled to an outer perimeter edge of top wall 34T as suggested in FIGS. 4 and 11. Top seal wall 34T mates with bottom surface 302B of inner rim 302 as suggested in FIGS. 7 and 11. Outer side seal wall 34S mates with inner surface 303 of lower portion 301L of outer wall 301 of sheet-support ring 30 as shown, for example, in FIG. 11. In an illustrative embodiment, the six inner rim segments 341 coupled to top seal wall 34T and shown in FIG. 4 are omitted.

[0050] Annular brim seal 34 is made of PLASTISOL retention sealant and is not preformed in an illustrative embodiment. Liquid sealant is injected into an annular channel formed on the underside of sheet-support ring 30 and it adheres to bottom surface 302B of inner rim 302 and to inner surface 303 of lower portion 301L of outer wall 301 to form annular brim seal 34 in place on sheet-support ring 30.

[0051] Package 10 is a high-temperature retortable barrier package configured to seal contents under high-temperature and high-pressure sterilization and microwave cooking and does not allow transmission of oxygen or moisture in accordance with illustrative embodiments. Lid 14 can be mounted on container brim 24 using available cappers (not shown) while a retainer arm 40 included in a can gripper 42 extends into a radially outwardly opening gripper channel 122 as shown diagrammatically in FIG. 9.

[0052] A retortable package 10 includes a container 12 and a lid 14 as shown in FIGS. 1 and 3. Each of container 12 and lid 14 is made entirely of plastics materials. Package 10 can be opened by a consumer as suggested in FIG. 2. Package 10 is a retortable, barrier package configured to survive a high-

temperature sterilization process and cooking process. Lid 14 can be applied to container 12 at a factory in various ways and by conventional cappers.

[0053] Container 12 includes a receptacle 21, 22 formed to include a product-storage region 26 and a brim 24 coupled to receptacle 21, 22 as suggested in FIGS. 3, 6, and 7. Brim 24 is formed to include a brim aperture 28 opening into product-storage 26 region formed in receptacle 21, 22.

[0054] Lid 14 including a brim seal 34, a sheet-support ring 30, and a removable closure 32 as shown, for example, in FIGS. 3 and 4. Sheet-support ring 30 is adhered to brim seal 34 and coupled to brim 24 to position a ring aperture 302E formed in sheet-support ring 30 to open into product-storage region 26 and to trap brim seal 34 between brim 24 and sheet-support ring 30 to establish an endless sealed connection between brim 24 of receptacle 21, 22 and sheet-support ring 30 of lid 14 as suggested in FIGS. 6 and 7. Removable closure 32 includes a peelable membrane sheet 321 coupled temporarily to a topside portion 27 of sheet-support ring 30 to close ring aperture 302E and cooperate with sheet-support ring 30 and brim seal 34 to provide means for retaining product stored in product-storage region 26 in a sealed chamber during exposure of container 12 and lid 14 to high package-sterilization and cooking temperatures until peelable membrane sheet 321 is separated from topside portion 27 of sheet-support ring 30 to open ring aperture 302E so that product can be discharged from product-storage region 26 in sequence through brim aperture 28 and ring aperture 302E.

[0055] Receptacle 21, 22 and brim 24 cooperate to form a monolithic component made of a plastics material. Sheet-support ring 30 is made of a plastics material. Brim seal 34 is coupled to an underside of sheet-support ring 30 and arranged to mate with brim 24 when sheet-support ring 30 is coupled to brim 30. Brim seal 34 is also made of a plastics material.

[0056] Brim 24 includes a downwardly facing surface 24D and is formed to include an outwardly opening undercut space 21 below the downwardly facing surface 24D as suggested in FIG. 8. Sheet-support ring 30 includes an outer wall 301 arranged to surround brim 24 and at least one lid-retention lug 304 coupled to outer wall 301 and arranged to extend inwardly into the outwardly opening undercut space 21 to confront the downwardly facing surface 24D of brim 24 to provide means for retaining sheet-support ring 30 in a stationary, mounted position on brim 24 to cause brim seal 34 to establish the endless sealed connection between brim 24 and sheet-support ring 30 as suggested in FIG. 7.

[0057] Sheet-support ring 30 includes an inwardly extending endless inner rim 302 coupled to outer wall 301 of sheet-support ring 30 and arranged to lie above and in axially spaced-apart relation to an upwardly facing first endless seal-receiving surface 27 of brim 24 as suggested in FIG. 7. Outer wall 301 of sheet-support ring 30 is arranged to extend around and lie in radially spaced-apart relation to an outwardly facing second endless seal-receiving surface 24E of brim 24 located between the downwardly facing surface 24 bordering outwardly opening undercut channel 21 and the upwardly facing first endless seal-receiving surface 27 as also suggested in FIG. 7.

[0058] Brim seal 34 includes a top seal wall 34T, an outer side seal wall 34S, and (in an illustrative embodiment) several inner side seal walls 341 as shown best in FIG. 4. Top seal wall 34T is trapped between downwardly facing surface 302B of inwardly extending endless inner rim 302 of sheet-support ring 30 and upwardly facing first endless seal-receiving sur-

face 27 of brim 24 as suggested in FIG. 7. Outer side seal wall 34S is coupled to an outer perimeter edge of top seal wall 34T and trapped between a portion 301L of outer wall 301 of sheet-support ring 30 and the outwardly facing second endless seal-receiving surface 34S of brim 24 as also suggested in FIG. 7.

[0059] A portion of inwardly extending endless inner rim 302 of sheet-support ring 30 is arranged to mate with and lie between peelable membrane sheet 321 and top seal wall 34T as suggested in FIG. 7. The downwardly facing surface 302B of inwardly extending endless inner rim 302 of sheet-support ring 30 is arranged to extend in a substantially horizontal direction as suggested in FIG. 8. The portion 301L of outer wall 301 of sheet-support ring 30 that mates with outer side seal wall 34S of brim seal 34 is arranged to extend in a substantially vertical direction to lie in orthogonal relation to downwardly facing surface 302B of inwardly extending endless inner rim 302 of sheet-support ring 30 as also suggested in FIG. 8.

[0060] Each lid-retention lug 34 provided in sheet-support ring 30 includes an inclined cam ramp 304C configured to provide means for riding on an outer edge of brim 24 during downward movement of lid 14 in a downward direction 100 toward container 12 during a lid-mounting process and elastic properties of the plastics material used to form outer wall 301 of sheet-support ring 30 allows elastic flexure of a lower portion 301L of outer wall 301 carrying the at least one lid-retention lug 34 so that each lid-retention lug 34 snaps into the outwardly opening undercut space 21 formed in brim 24 to place an upwardly facing anchor face 304A of each lid-retention lug 34 in confronting relation with an underside 24D of brim 24 once lid 14 is moved far enough in downward direction 100 to trap brim seal 34 between brim 24 and sheet-support ring 30 as suggested in FIGS. 8, 9, and 7. It is within the scope of this disclosure to provide any suitable number of lid-retention lugs 34. Lid-retention lugs 34 are coupled to outer wall 301 and arranged to extend inwardly into the outwardly opening undercut space 21 to engage downwardly facing surface 24D of brim 24 to provide means for retaining sheet-support ring 30 in a stationary, mounted position on brim 24 to cause brim seal 34 to establish the endless sealed connection between brim 24 and sheet-support ring 30.

[0061] Sheet-support ring 30 further includes inner rim means 305 coupled to the downwardly facing surface 302B of inwardly extending endless inner rim 302 of sheet-support ring 30 to lie in spaced-apart relation to the at least one lid-retention lug 34 to locate brim seal 34 therebetween for engaging an inner edge 28 of brim 24 during downward movement of lid 14 in a downward direction 100 toward mating engagement with brim 24 as suggested in FIGS. 8, 9, and 7 so that lid 14 is located in a centered position relative to container 12 to cause the at least one lid-retention lug 34 to extend into the outwardly opening undercut space 21 formed in brim 24 and establish the endless sealed connection between brim 24 and sheet-support ring 30 as suggested in FIG. 6. The inner rim means 305 includes a series of inner rim segments 305 arranged to lie in spaced-apart relation to one another on downwardly facing surface 302B of inwardly extending endless rim 302 of sheet-support ring 30. Each inner rim segment 305 includes a curved outwardly facing locator-cam surface 305C facing toward the inner edge of brim 24. The inner rim means 305 is located between brim seal 34 and brim aperture 28 and in spaced-apart relation to an

inner perimeter edge 302E of inwardly extending endless inner rim 302 defining brim aperture 28 as suggested in FIGS. 4 and 7-9.

[0062] A retortable package 10 includes a container 12 and a lid 14 mounted on container 12 to close a brim aperture 28 opening into an interior region 26 of container 12 as suggested in FIGS. 1-3 and 6. Lid 14 includes a removable closure 32 including a membrane sheet 321 and a pull tab 322 coupled to membrane sheet 321, a sheet-support ring 30 configured to mount permanently on a brim 24 of container 12 when lid 14 is mounted on container 12, and a brim seal 34 coupled to an underside of sheet-support ring 30 to move therewith and trapped between sheet-support ring 30 and brim 24 when lid 14 is mounted on container 12 as suggested in FIGS. 3-7.

[0063] The membrane sheet 321 of removable closure 32 is coupled temporarily to a topside portion 27 of sheet-support ring 30 for removal therefrom to expose a ring aperture 302E formed in sheet-support ring 30 and aligned with brim aperture 28 to open into interior region 26 of container 12. Each of container 12, sheet-support ring 30, and removable closure 32 is made of a plastics material and cooperate to provide means for retaining product stored in interior region 26 of container 12 in a sealed chamber during exposure of container 12 and lid 14 to high package-sterilization and cooking temperatures until peelable membrane sheet 321 is separated from topside portion 27 of sheet-support ring 30 to open ring aperture 302E so that product can be discharged from product-storage region 26 in sequence through brim aperture 28 and ring aperture 302E.

[0064] A package 100 in accordance with a second embodiment of the present disclosure is shown in FIGS. 12-22 and includes a container 112 and a lid 114 configured to mount on container 112 as suggested in FIGS. 12 and 14. In illustrative embodiments, each of container 112 and lid 114 is comprised only of plastics materials that can survive exposure to high temperatures associated with, for example, a package heating or sterilization process.

[0065] Lid 114 includes several components made of plastics materials. These components include a sheet-support ring 130, a removable closure 132, and an annular brim seal 134 as shown in FIG. 15. Lid 114 is mounted on container 112 at a factory after container 112 is filled as suggested in a series of sectional views provided in FIGS. 19, 20, and 18.

[0066] Container 112 includes a floor 121 and a side wall 122 extending upwardly from a perimeter edge of floor 121 and terminating at a brim 124 as shown, for example, in FIGS. 14 and 17. Floor 121 and side wall 122 cooperate to form an interior product-storage region 126 in container 112. Brim 124 includes an upwardly facing endless seal-receiving surface 127 and is formed to include an inner edge 128 defining a brim aperture opening into product-storage region 126 formed in container 112 as suggested in FIGS. 14 and 19. It is within the scope of this disclosure to provide container 112 with any suitable size and shape.

[0067] Lid 114 includes a sheet-support ring 130 configured to mount permanently on brim 124 of container 112 during a lid-installation process, a removable closure 132 configured to mount temporarily on sheet-support ring 130 until it is removed by a consumer to gain access to product-storage region 126, and an annular brim seal 134 provided on the underside of sheet-support ring 130 as shown, for example, in FIGS. 14 and 15. When lid 114 is mounted on container 112 at a factory as suggested in FIGS. 12 and 17, (1)

sheet-support ring 130 is coupled permanently to annular container brim 124 and (2) annular brim seal 134 is trapped between sheet-support ring 130 and container brim 124 to establish a sealed connection therebetween.

[0068] Removable closure 132 includes a peelable membrane sheet 1321 and a pull tab 1322 coupled to peelable membrane sheet 1321 in an illustrative embodiment as suggested in FIGS. 12, 13, and 15. A consumer can gain access to product stored in product-storage region 126 formed in container 112 by separating removable closure 132 from sheet-support ring 130 as suggested in FIG. 13. In an illustrative embodiment, the consumer grips and pulls upwardly on pull tab 1322 to cause peelable membrane sheet 1321 to be peeled away from sheet-support ring 130 as suggested in FIG. 13. Removable closure 132 is made of a plastics material able to withstand exposure to high temperatures associated with package sterilization and cooking. Removable closure 132 can fracture to provide easy peel.

[0069] Sheet-support ring 130 has a size and shape selected to match and mate with container brim 134. Sheet-support ring 130 is round in the illustrated embodiment. It is within the scope of this disclosure to provide sheet-support ring 130 with a rectangular, square, oval, or other suitable shape selected to mate with a companion container brim.

[0070] Annular brim seal 134 is sized to lie in a fixed position in a downwardly opening channel 130C formed in sheet-support ring 130 as suggested in FIGS. 15, 21, and 22. Annular brim seal 134 has a U-shaped cross section in an illustrative embodiment as shown in FIGS. 18 and 22.

[0071] Sheet-support ring 130 includes an axially extending annular outer wall 1301 and a radially inwardly extending endless inner rim 1302 having an outer edge coupled to an upper portion of annular side wall 1301 as suggested in FIGS. 18-20 and 22. Sheet-support ring 30 includes an annular outer lid-retention lug 1304 coupled to a lower portion of outer wall 1301 as also suggested in FIGS. 18-20 and 22. Sheet-support ring 130 is made of a crystallized polyethylene terephthalate (CPET) material that is able to provide a high-temperature barrier in an illustrative embodiment. It is within the scope of this disclosure to provide sheet-support ring 130 with any suitable round or non-round shape.

[0072] Sheet-support ring 130 also includes an axially extending annular inner wall 1306 coupled to an inner edge of radially inwardly extending rim 1302 as suggested in FIGS. 15, 21, and 22. In an illustrative embodiment, the axially extending annular inner wall 1306 is arranged to lie in spaced-apart and concentric relation to the surrounding axially extending annular outer wall 1301 to form an annular channel 130C bounded by annular inner and outer walls 1301, 1306 and an annular ceiling established by inner rim 1302 and to locate annular brim seal 134 in annular channel 130C between inner and outer walls 1301, 1306 as suggested in FIGS. 15, 21, and 22.

[0073] Inner rim 1302 of sheet-support ring 130 includes a top surface 1302T coupled to a downwardly facing surface of membrane sheet 1321 as shown, for example, in FIGS. 18 and 21. Membrane sheet 1321 can be welded to top surface 1302T of inner rim 1302 during molding. Inner rim 1302 also includes a bottom surface 1302B shown in FIG. 15 and coupled to an upwardly facing surface of annular brim seal 134 as also suggested in FIGS. 18 and 22.

[0074] Outer lid-retention lug 1304 is configured to provide means for gripping container 112 (e.g., an outer portion of container brim 124) to retain sheet-support ring 130 in a

stationary, mounted position on container brim 124 as suggested in FIGS. 17 and 18. An illustrative example of mating engagement of annular outer lid-retention lug 1304 and container brim 124 during mounting of lid 114 onto container 112 is shown in FIGS. 19, 20, and 18.

[0075] Outer lid-retention lug 1304 includes an inclined cam ramp 1304C for riding on an outer edge 124E of container brim 124 during downward movement of lid 114 in direction 1100 toward container 112 during a lid-mounting process at a factory as suggested in FIGS. 19 and 20. Elastic properties of the plastics material used to form annular outer wall 1301 allows elastic flexure of lower portion of annular outer wall 1301 as suggested in FIG. 20 so that lid-retention lug 1304 can snap into a radially outwardly opening undercut space 1121 formed in container 112 underneath brim 124 to place an anchor face 1304A of lid-retention lug 1304 in confronting relation with a downwardly facing surface 124D on the underside of container brim 124 to trap a portion of annular brim seal 134 therebetween as shown, for example, in FIG. 18 once lid 114 is moved far enough in downward direction 1100 to trap annular brim seal 134 between inner rim 1302 of sheet-support ring 130 and container brim 124.

[0076] Annular inner wall 1306 is configured to provide means for engaging an inner edge 124E of container brim 124 during downward movement of lid 114 in downward direction 1100 toward mating engagement with container 112 so that lid 114 is located in a centered position relative to container 112 to cause annular lid-retention lug 1304 (to extend into the radially outwardly opening annular undercut space 1121 formed in container 112 in an illustrative embodiment) to face toward downwardly facing surface 124D of container brim 124 and trap a portion of annular brim seal 134 therebetween as suggested, in sequence, in FIGS. 19, 20, and 18.

[0077] Annular brim seal 134 includes a top seal wall 134T, an outer side seal wall 1340S coupled to an outer perimeter edge of top seal wall 134T, and an inner side seal wall 1341S coupled to an inner perimeter edge of top seal wall 134T as suggested in FIGS. 15 and 22. Top seal wall 134T is mated with bottom surface 1302B of inner rim 302 as suggested in FIGS. 18 and 22. Outer side seal wall 1340S is mated with inner surface 1303 of the lower portion of outer wall 1301 of sheet-support ring 130 as shown, for example, in FIG. 22.

[0078] Annular brim seal 134 is made of PLASTISOL retention sealant and is not preformed in an illustrative embodiment. Liquid sealant is injected into an annular channel 130C formed on the underside of sheet-support ring 130 and it adheres to bottom surface 1302B of inner rim 1302 and inner surfaces of outer and inner walls 1301, 1306 to form annular brim seal 134 in place on sheet-support ring 130.

[0079] Package 100 is a high-temperature retortable barrier package configured to seal contents under high-temperature and high-pressure sterilization and microwave cooking and does not allow transmission of oxygen or moisture in accordance with illustrative embodiments. Lid 114 can be mounted on container brim 124 at a factory using available cappers (not shown) in a manner shown, for example, in FIG. 9.

[0080] A retortable package 100 includes a container 112 and a lid 114 as shown in FIGS. 12 and 14. Each of container 112 and lid 114 is made entirely of plastics materials. Package 100 can be opened by a consumer as suggested in FIG. 13. Package 100 is a retortable, barrier package configured to survive a high-temperature sterilization process. Lid 114 can be applied to container 112 at a factory in various ways and by conventional cappers.

[0081] Container 112 includes a receptacle 121, 122 formed to include a product-storage region 126 and a brim 124 coupled to receptacle 121, 122 as suggested in FIGS. 14, 17, and 18. Brim 124 is formed to include a brim aperture 128 opening into product-storage 126 region formed in receptacle 121, 122.

[0082] Lid 114 including a brim seal 134, a sheet-support ring 130, and a removable closure 132 as suggested in FIGS. 14 and 15. Sheet-support ring 130 is adhered to brim seal 134 and coupled to brim 124 to position a ring aperture 302E formed in sheet-support ring 130 to open into product-storage region 126 and to trap brim seal 134 between brim 124 and sheet-support ring 130 to establish an endless sealed connection between brim 124 of receptacle 121, 122 and sheet-support ring 130 of lid 114 as suggested in FIGS. 17 and 18. Removable closure 132 includes a peelable membrane sheet 1321 coupled temporarily to a topside portion 127 of sheet-support ring 130 to close ring aperture 1302E and cooperate with sheet-support ring 130 and brim seal 134 to provide means for retaining product stored in product-storage region 126 in a sealed chamber during exposure of container 112 and lid 114 to high package-sterilization temperatures until the peelable membrane sheet 132 is separated from topside portion 127 of sheet-support ring 130 to open ring aperture 1302E so that product can be discharged from product-storage region 126 in sequence through brim aperture 128 and ring aperture 1302E.

[0083] Receptacle 121, 122 and brim 124 cooperate to form a monolithic component made of a plastics material. Sheet-support ring 130 is made of a plastics material. Brim seal 134 is coupled to an underside of sheet-support ring 130 and arranged to mate with brim 124 when sheet-support ring 130 is coupled to brim 130. Brim seal 134 is also made of a plastics material.

[0084] Brim 124 includes a downwardly facing surface 1302B and is formed to include an outwardly opening undercut space 121 below downwardly facing surface 1302B as suggested in FIG. 19. Sheet-support ring 130 includes an outer wall 1301 arranged to surround brim 124 and at least one lid-retention lug 1304 coupled to outer wall 1301 and arranged to extend inwardly into the outwardly opening undercut space 121 to confront downwardly facing surface 1302B of brim 124 to provide means for retaining sheet-support ring 130 in a stationary, mounted position on brim 124 to cause brim seal 134 to establish the endless sealed connection between brim 124 and sheet-support ring 130 as suggested in FIG. 18.

[0085] Sheet-support ring 130 includes an inwardly extending endless inner rim 1302 coupled to outer wall 1301 of sheet-support ring 130 and arranged to lie above and in axially spaced-apart relation to an upwardly facing first endless seal-receiving surface 127 of brim 124 as suggested in FIG. 18. Outer wall 1301 of sheet-support ring 130 is arranged to extend around and lie in radially spaced-apart relation to an outwardly facing second endless seal-receiving surface 124E of brim 124 located between the outwardly opening undercut channel 121 and the upwardly facing first endless seal-receiving surface 127 as also suggested in FIG. 18.

[0086] Brim seal 134 includes a top seal wall 134T, an outer side seal wall 1340S, and inner side seal wall 1341S as shown best in FIG. 15. Top seal wall 134T is trapped between downwardly facing surface 1302B of the inwardly extending endless inner rim 1302 of sheet-support ring 130 and the

upwardly facing first endless seal-receiving surface 127 of brim 124. Outer side seal wall 1340S is coupled to an outer perimeter edge of the top seal wall 134T and trapped between a portion of outer wall 1301 of sheet-support ring 130 and the outwardly facing second endless seal-receiving surface 124E of brim 124 as also suggested in FIG. 18. Inner side seal wall 1341S is coupled to an inner perimeter edge of top seal wall 134T as suggested in FIG. 15.

[0087] A portion of inwardly extending endless inner rim 1302 of sheet-support ring 130 is arranged to mate with and lie between the peelable membrane sheet 1321 and top seal wall 134T as suggested in FIG. 18. The downwardly facing surface 1302B of inwardly extending endless inner rim 1302 of sheet-support ring 130 is arranged to extend in a substantially horizontal direction. The portion of outer wall 1301 of sheet-support ring 130 that mates with outer side seal wall 1340S of brim seal 134 is arranged to extend in a substantially vertical direction to lie in orthogonal relation to the downwardly facing surface 1302B of inwardly extending endless inner rim 1302 of sheet-support ring 130 as also suggested in FIG. 19.

[0088] Sheet-support ring 130 is made of an elastic plastics material. The outwardly facing second endless seal-receiving surface 124E of brim 124 is sloped to provide means for engaging a lid-retention lug 134 included in sheet-support ring 130 during downward movement of lid 114 in a downward direction 1100 toward mating engagement with brim 124 as suggested in FIGS. 19 and 20 to cause elastic flexure of outer wall 1301 of sheet-support ring 130 so that a lid-retention lug 134 snaps into the outwardly opening undercut space 121 formed in brim 124 as suggested in FIG. 18 to place an upwardly facing anchor face 1304A of lid-retention lug 1304 in confronting relation with the downwardly facing surface 124D of brim 124 and mating relation with a free end of the outer side seal wall 1340S of brim seal 134 once lid 14 is moved far enough in downward direction 1100 to trap brim seal 134 between brim 124 and sheet-support ring 130.

[0089] Sheet-support ring 130 further includes an inner wall 1306 coupled to the inwardly extending endless inner rim 1302 of sheet-support ring 130 as shown, for example, in FIGS. 14, 15, and 18. Inner wall 1306 is surrounded by outer wall 1301 to define an annular seal-receiving channel 130C therebetween as suggested in FIGS. 15, 18, and 22. Brim seal 134 is located in annular seal-receiving channel 130C. Brim seal 134 further includes an inner side seal wall 1341S coupled to an inner perimeter edge of the top seal wall 134T as suggested in FIG. 22 and trapped between inner wall 1306 of sheet-support ring 130 and brim 124 of container 12 as suggested in FIG. 18.

[0090] Each of inner and outer walls 1306, 1301 of sheet-support ring 130 has an annular shape as shown, for example, in FIG. 15. Inner and outer walls 1306, 1301 are arranged to lie in concentric relation to one another. A free end of the outer side seal wall 1340S is trapped between brim 124 of container 12 and a lid-retention lug 134 included in sheet-support ring 130 when sheet-support ring 130 of lid 114 is retained in the stationary, mounted position on brim 124 of container 12 as suggested in FIG. 18.

[0091] Brim 124 further includes an upwardly facing first endless seal-receiving surface 127 facing away from the downwardly facing surface 124D of brim 124 and engaging top seal wall 134T of brim seal 134 as suggested in FIG. 18. Brim 124 also includes an outwardly facing second endless seal-receiving surface 124E arranged to interconnect outer-

most edges of the upwardly facing first endless seal-receiving surface 127 and the downwardly facing surface 124D as suggested in FIG. 19 and sloped to diverge in a downward direction 1100 from a narrow width at the upwardly facing first endless seal-receiving surface 127 to a relatively wider width at the downwardly facing surface 124D and to engage the outer side seal wall 1340S of brim seal 134 as suggested in FIG. 18. Outwardly facing second endless seal-receiving surface 124E has a convex cross-sectional shape as shown, for example, in FIG. 19.

[0092] Each lid-retention lug 134 provided in sheet-support ring 130 includes an inclined cam ramp 1304C configured to provide means for riding on an outer edge 124E of brim 124 during downward movement of lid 114 in a downward direction 1100 toward container 112 during a lid-mounting process and elastic properties of the plastics material used to form outer wall 1301 of sheet-support ring 130 allows elastic flexure of a lower portion 1301L of outer wall 1301 carrying the at least one lid-retention lug 134 so that each lid-retention lug 134 snaps into the outwardly opening undercut space 121 formed in brim 124 to place an upwardly facing anchor face 1304A of each lid-retention lug 134 in confronting relation with an underside of brim 124 once lid 114 is moved far enough in downward direction 1100 to trap brim seal 134 between brim 124 and sheet-support ring 130 as suggested in FIGS. 19, 20, and 18. Lid-retention lug 134 is coupled to outer wall 1301 and arranged to extend inwardly into the outwardly opening undercut space 121 to engage downwardly facing surface 124D of brim 124 to provide means for retaining sheet-support ring 130 in a stationary, mounted position on brim 124 to cause brim seal 134 to establish the endless sealed connection between brim 124 and sheet-support ring 130.

[0093] Sheet-support ring 130 further includes inner rim means 1306 coupled to downwardly facing surface 1302B of inwardly extending endless inner rim 1302 of sheet-support ring 130 to lie in spaced-apart relation to the at least one lid-retention lug 134 to locate brim seal 134 therebetween for engaging an inner edge of brim 124 during downward movement of lid 114 in a downward direction 1100 toward mating engagement with brim 124 as suggested in FIGS. 19, 20, and 18 so that lid 114 is located in a centered position relative to container 112 to cause the at least one lid-retention lug 134 to extend into the outwardly opening undercut space 121 formed in brim 124 and establish the endless sealed connection between brim 124 and sheet-support ring 130 as suggested in FIGS. 15 and 18-20.

[0094] A retortable package 110 includes a container 112 and a lid 114 mounted on container 112 to close a brim aperture 128 opening into an interior region 126 of container 12 as suggested in FIGS. 12-14 and 17. Lid 114 includes a removable closure 132 including a membrane sheet 1321 and a pull tab 1322 coupled to membrane sheet 1321, a sheet-support ring 130 configured to mount permanently on a brim 124 of container 112 when lid 114 is mounted on container 112, and a brim seal 134 coupled to an underside of sheet-support ring 130 to move therewith and trapped between sheet-support ring 130 and brim 124 when lid 14 is mounted on container 112 as suggested in FIGS. 14-18.

[0095] The membrane sheet 1321 of removable closure 132 is coupled temporarily to a topside portion 127 of sheet-support ring 130 for removal therefrom to expose a ring aperture 1302E formed in sheet-support ring 130 and aligned with brim aperture 128 to open into interior region 126 of container 112. Each of container 112, sheet-support ring 130,

and removable closure **132** is made of a plastics material and cooperate to provide means for retaining product stored in interior region **126** of container **112** in a sealed chamber during exposure of container **112** and lid **114** to high package-sterilization temperatures until the peelable membrane sheet **1321** is separated from topside portion **127** of sheet-support ring **130** to open ring aperture **1302E** so that product can be discharged from product-storage region **126** in sequence through brim aperture **128** and ring aperture **1302E**.

1. A retortable package comprising a container including a receptacle formed to include a product-storage region and a brim coupled to the receptacle and formed to include a brim aperture opening into the product-storage region formed in the receptacle and a lid including a brim seal, a sheet-support ring adhered to the brim seal and coupled to the brim to position a ring aperture formed in the sheet-support ring to open into the product-storage region and to trap the brim seal between the brim and the sheet-support ring to establish an endless sealed connection between the brim of the receptacle and the sheet-support ring of the lid, and a removable closure including a peelable membrane sheet coupled temporarily to a topside portion of the sheet-support ring to close the ring aperture and cooperate with the sheet-support ring and the brim seal to provide means for retaining product stored in the product-storage region in a sealed chamber during exposure of the container and lid to high package-sterilization and cooking temperatures until the peelable membrane sheet is separated from the topside portion of the sheet-support ring to open the ring aperture so that product can be discharged from the product-storage region in sequence through the brim aperture and the ring aperture.
2. The retortable package of claim **1**, wherein the sheet-support ring includes an inwardly extending endless inner rim coupled to the outer wall of the sheet-support ring and arranged to lie above and in axially spaced-apart relation to an upwardly facing first endless seal-receiving surface of the brim, the outer wall of the sheet-support ring is arranged to extend around and lie in radially spaced-apart relation to an outwardly facing second endless seal-receiving surface of the brim located between the outwardly opening undercut channel and the upwardly facing first endless seal-receiving surface, the brim seal includes a top seal wall trapped between a downwardly facing surface of the inwardly extending endless inner rim of the sheet-support ring and the upwardly facing first endless seal-receiving surface of the brim, and the brim seal also includes an outer side seal wall coupled to an outer perimeter edge of the top seal wall and trapped between a portion of the outer wall of the sheet-support ring and the outwardly facing second endless seal-receiving surface of the brim.
3. The retortable package of claim **2**, wherein a portion of the inwardly extending endless inner rim of the sheet-support ring is arranged to mate with and lie between the peelable membrane sheet and the top seal wall.
4. The retortable package of claim **2**, wherein the downwardly facing surface of the inwardly extending endless inner rim of the sheet-support ring is arranged to extend in a substantially horizontal direction and the portion of the outer wall of the sheet-support ring that mates with the outer side seal wall of the brim seal is arranged to extend in a substantially

vertical direction to lie in orthogonal relation to the downwardly facing surface of the inwardly extending endless inner rim of the sheet-support ring.

5. The retortable package of claim **2**, wherein the sheet-support ring is made of an elastic plastics material and the outwardly facing second endless seal-receiving surface of the brim is sloped to provide means for engaging a lid-retention lug included in the sheet-support ring during downward movement of the lid in a downward direction toward mating engagement with the brim to cause elastic flexure of the outer wall of the sheet-support ring so that a lid-retention lug snaps into the outwardly opening undercut space formed in the brim to place an upwardly facing anchor face of the lid-retention lug in confronting relation with the downwardly facing surface of the brim and mating relation with a free end of the outer side seal wall of the brim seal once the lid is moved far enough in the downward direction to trap the brim seal between the brim and the sheet-support ring.

6. The retortable package of claim **5**, wherein the sheet-support ring further includes an inner wall coupled to the inwardly extending endless inner rim of the sheet-support ring and surrounded by the outer wall to define an annular seal-receiving channel therebetween, the brim seal is located in the annular seal-receiving channel, and the brim seal further includes an inner side seal wall coupled to an inner perimeter edge of the top seal wall and trapped between the inner wall of the sheet-support ring and the brim of the container.

7. The retortable package of claim **6**, wherein each of the inner and outer walls of the sheet-support ring has an annular shape and the inner and outer walls are arranged to lie in concentric relation to one another.

8. The retortable package of claim **6**, wherein a free end of the outer side seal wall is trapped between the brim of the container and a lid-retention lug included in the sheet-support ring when the sheet-support ring of the lid is retained in the stationary, mounted position on the brim of the container.

9. The retortable package of claim **2**, wherein the brim further includes an upwardly facing first endless seal-receiving surface facing away from the downwardly facing surface of the brim and engaging the top seal wall of the brim seal and an outwardly facing second endless seal-receiving surface arranged to interconnect outermost edges of the upwardly facing first endless seal-receiving surface and the downwardly facing surface and sloped to diverge in a downward direction from a narrow width at the upwardly facing first endless seal-receiving surface to a relatively wider width at the downwardly facing surface and to engage the outer side seal wall of the brim seal.

10. The retortable package of claim **9**, wherein the outwardly facing second endless seal-receiving surface has a convex cross-sectional shape.

11. The retortable package of claim **9**, wherein the sheet-support ring is made of an elastic plastics material and the outwardly facing second endless seal-receiving surface of the brim is sloped to provide means for engaging a lid-retention lug included in the sheet-support ring during downward movement of the lid in a downward direction toward mating engagement with the brim to cause elastic flexure of the outer wall of the sheet-support ring so that the lid-retention lug snaps into the outwardly opening undercut space formed in the brim to place an upwardly facing anchor face of the lid-retention lug in confronting relation with the downwardly facing surface of the brim and mating relation with a free end

of the outer side seal wall of the brim seal once the lid is moved far enough in the downward direction to trap the brim seal between the brim and the sheet-support ring.

12. The retortable package of claim **1**, wherein the receptacle and brim cooperate to form a monolithic component made of a plastics material, the sheet-support ring is made of a plastics material, and the brim seal is coupled to an underside of the sheet-support ring and arranged to mate with the brim when the sheet-support ring is coupled to the brim.

13. The retortable package of claim **12**, wherein the brim includes a downwardly facing surface and is formed to include an outwardly opening undercut space below the downwardly facing surface and the sheet-support ring includes an outer wall arranged to surround the brim and at least one lid-retention lug coupled to the outer wall and arranged to extend inwardly into the outwardly opening undercut space to confront the downwardly facing surface of the brim to provide means for retaining the sheet-support ring in a stationary, mounted position on the brim to cause the brim seal to establish the endless sealed connection between the brim and the sheet-support ring.

14. The retortable package of claim **13**, wherein each lid-retention lug includes an inclined cam ramp configured to provide means for riding on an outer edge of the brim during downward movement of the lid in a downward direction toward the container during a lid-mounting process and elastic properties of the plastics material used to form the outer wall of the sheet-support ring allows elastic flexure of a lower portion of the outer wall carrying the at least one lid-retention lug so that each lid-retention lug snaps into the outwardly opening undercut space formed in the brim to place an upwardly facing anchor face of each lid-retention lug in confronting relation with an underside of the brim once the lid is moved far enough in the downward direction to trap the brim seal between the brim and the sheet-support ring.

15. The retortable package of claim **13**, wherein the sheet-support ring further includes inner rim means coupled to the downwardly facing surface of the inwardly extending endless inner rim of the sheet-support ring to lie in spaced-apart relation to the at least one lid-retention lug to locate the brim seal therebetween for engaging an inner edge of the brim during downward movement of the lid in a downward direction toward mating engagement with the brim so that the lid is located in a centered position relative to the container to cause the at least one lid-retention lug to extend into the outwardly opening undercut space formed in the brim and establish the endless sealed connection between the brim and the sheet-support ring.

16. The retortable package of claim **15**, wherein the inner rim means includes a series of inner rim segments arranged to lie in spaced-apart relation to one another on the downwardly facing surface of the inwardly extending endless rim of the sheet-support ring and each inner rim segment includes a curved outwardly facing locator-cam surface facing toward the inner edge of the brim.

17. The retortable package of claim **16**, wherein the inner rim means is located between the brim seal and the brim aperture and in spaced-apart relation to an inner perimeter edge of the inwardly extending endless inner rim defining the brim aperture.

18. The retortable package of claim **1**, wherein the brim includes a downwardly facing surface and is formed to include an outwardly opening undercut space below the downwardly facing surface and the sheet-support ring

includes an outer wall arranged to surround the brim and at least one lid-retention lug coupled to the outer wall and arranged to extend inwardly into the outwardly opening undercut space to engage the downwardly facing surface of the brim to provide means for retaining the sheet-support ring in a stationary, mounted position on the brim to cause the brim seal to establish the endless sealed connection between the brim and the sheet-support ring, the sheet-support ring includes an inwardly extending endless inner rim coupled to the outer wall of the sheet-support ring and arranged to lie above and in axially spaced-apart relation to an upwardly facing first endless seal-receiving surface of the brim, the outer wall of the sheet-support ring is arranged to extend around and lie in radially spaced-apart relation to an outwardly facing second endless seal-receiving surface of the brim located between the outwardly opening undercut channel and the upwardly facing first endless seal-receiving surface, the brim seal includes a top seal wall trapped between a downwardly facing surface of the inwardly extending endless inner rim of the sheet-support ring and the upwardly facing first endless seal-receiving surface of the brim, and the brim seal also includes an outer side seal wall coupled to a perimeter edge of the top seal wall and trapped between a portion of the outer wall of the sheet-support ring and the outwardly facing second endless seal-receiving surface of the brim.

19. The retortable package of claim **18**, wherein a portion of the inwardly extending endless inner rim of the sheet-support ring is arranged to mate with and lie between the peelable membrane sheet and the top seal wall.

20. The retortable package of claim **18**, wherein the downwardly facing surface of the inwardly extending endless inner rim of the sheet-support ring is arranged to extend in a substantially horizontal direction and the portion of the outer wall of the sheet-support ring that mates with the outer side seal wall of the brim seal is arranged to extend in a substantially vertical direction to lie in orthogonal relation to the downwardly facing surface of the inwardly extending endless inner rim of the sheet-support ring.

21. The retortable package of claim **18**, wherein the sheet-support ring is made of an elastic plastics material and the outwardly facing second endless seal-receiving surface of the brim is sloped to provide means for engaging a lid-retention lug included in the sheet-support ring during downward movement of the lid in a downward direction toward mating engagement with the brim to cause elastic flexure of the outer wall of the sheet-support ring so that a lid-retention lug snaps into the outwardly opening undercut space formed in the brim to place an upwardly facing anchor face of the lid-retention lug in confronting relation with the downwardly facing surface of the brim and mating relation with a free end of the outer side seal wall of the brim seal once the lid is moved far enough in the downward direction to trap the brim seal between the brim and the sheet-support ring.

22. A retortable package comprising
a container and

a lid mounted on the container to close a brim aperture opening into an interior region of the container, wherein the lid includes a removable closure including a membrane sheet and a pull tab coupled to the membrane sheet, a sheet-support ring configured to mount permanently on a brim of the container when the lid is mounted on the container, and a brim seal coupled to an underside of the sheet-support ring to move therewith and trapped between the sheet-support ring and the brim when the lid

is mounted on the container, and wherein the membrane sheet is coupled temporarily to a topside portion of the sheet-support ring for removal therefrom to expose a ring aperture formed in the sheet-support ring and aligned with the brim aperture to open into the interior region of the container.

23. The retortable package of claim **22**, wherein each of the container, the sheet-support ring, and the removable closure is made of a plastics material and cooperate to provide means for retaining product stored in the interior region of the container in a sealed chamber during exposure of the container and lid to high package-sterilization and cooking temperatures until the peelable membrane sheet is separated from the topside portion of the sheet-support ring to open the ring aperture so that product can be discharged from the product-storage region in sequence through the brim aperture and the ring aperture.

24. The retortable package of claim **23**, wherein the brim includes a downwardly facing surface and is formed to include an outwardly opening undercut space below the downwardly facing surface and the sheet-support ring includes an outer wall arranged to surround the brim and at least one lid-retention lug coupled to the outer wall and arranged to extend inwardly into the outwardly opening undercut space to engage the downwardly facing surface of the brim to provide means for retaining the sheet-support ring in a stationary, mounted position on the brim to cause the brim seal to establish the endless sealed connection between the brim and the sheet-support ring.

25. The retortable package of claim **22**, wherein the brim includes a downwardly facing surface and is formed to

include an outwardly opening undercut space below the downwardly facing surface and the sheet-support ring includes an outer wall arranged to surround the brim and at least one lid-retention lug coupled to the outer wall and arranged to extend inwardly into the outwardly opening undercut space to engage the downwardly facing surface of the brim to provide means for retaining the sheet-support ring in a stationary, mounted position on the brim to cause the brim seal to establish the endless sealed connection between the brim and the sheet-support ring.

26. The retortable package of claim **25**, wherein the sheet-support ring includes an inwardly extending endless inner rim coupled to the outer wall of the sheet-support ring and arranged to lie above and in axially spaced-apart relation to an upwardly facing first endless seal-receiving surface of the brim, the outer wall of the sheet-support ring is arranged to extend around and lie in radially spaced-apart relation to an outwardly facing second endless seal-receiving surface of the brim located between the outwardly opening undercut channel and the upwardly facing first endless seal-receiving surface, the brim seal includes a top seal wall trapped between a downwardly facing surface of the inwardly extending endless inner rim of the sheet-support ring and the upwardly facing first endless seal-receiving surface of the brim, and the brim seal also includes an outer side seal wall coupled to a perimeter edge of the top seal wall and trapped between a portion of the outer wall of the sheet-support ring and the outwardly facing second endless seal-receiving surface of the brim.

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