

Dec. 29, 1964

R. C. STOLK
CONTAINER

3,163,311

Filed Dec. 10, 1963

3 Sheets-Sheet 1

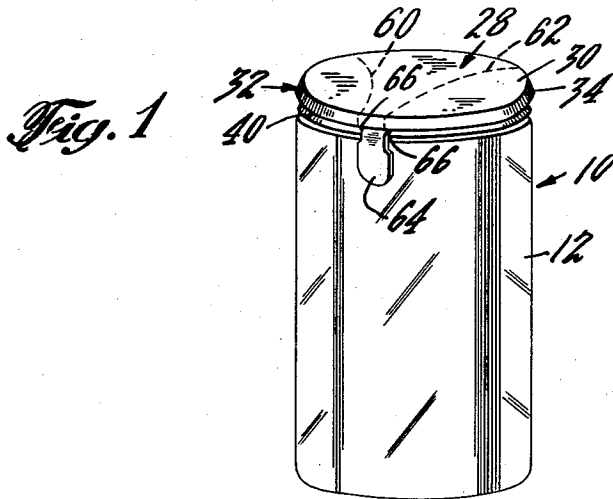


Fig. 2

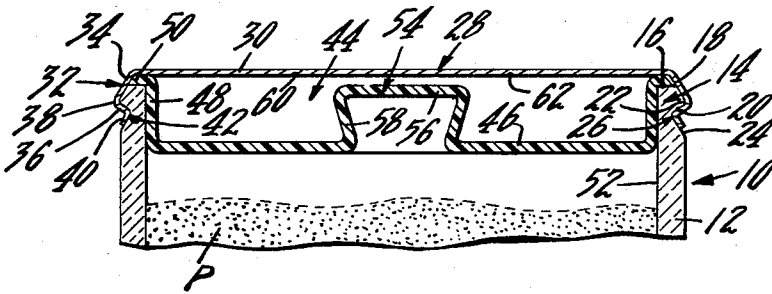
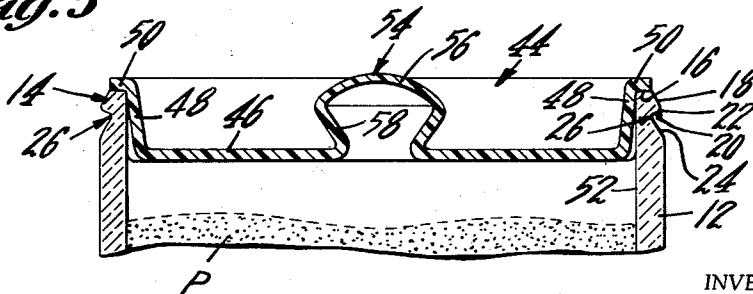


Fig. 3



INVENTOR.
ROBERT CORNELIUS STOLK

BY

Frank D. Presta

ATTORNEY

Dec. 29, 1964

R. C. STOLK
CONTAINER

3,163,311

Filed Dec. 10, 1963

3 Sheets-Sheet 2

Fig. 4

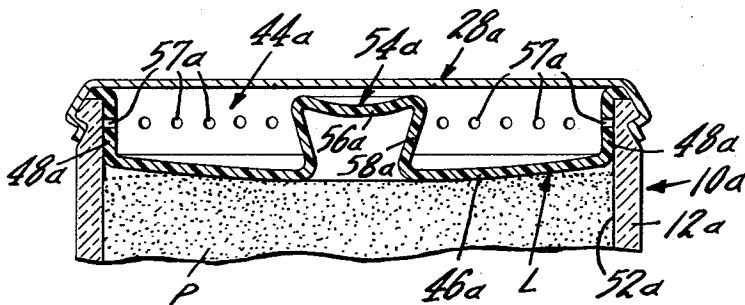
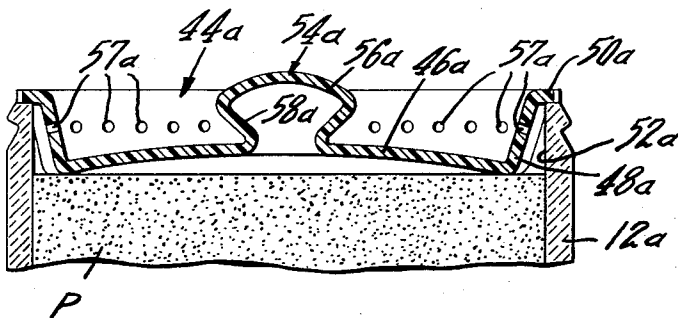


Fig. 5



INVENTOR
ROBERT CORNELIUS STOLK

BY

Frank P. Presta
ATTORNEY

Dec. 29, 1964

R. C. STOLK
CONTAINER

3,163,311

Filed Dec. 10, 1963

3 Sheets-Sheet 3

Fig. 6

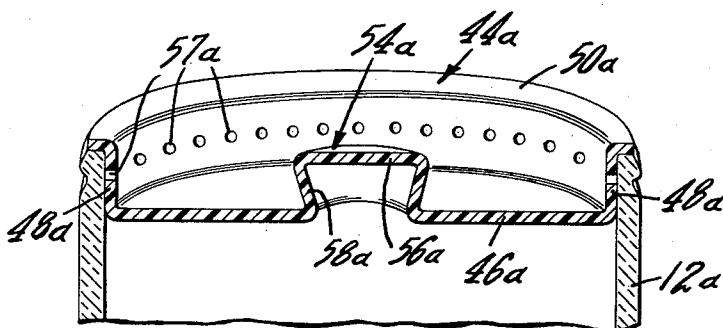


Fig. 7

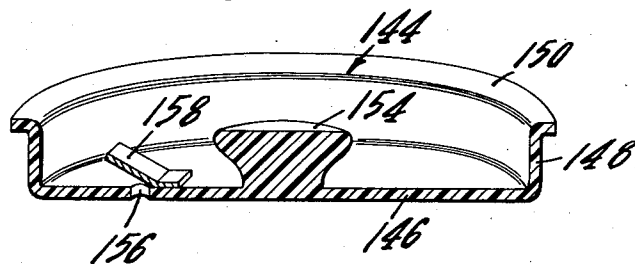
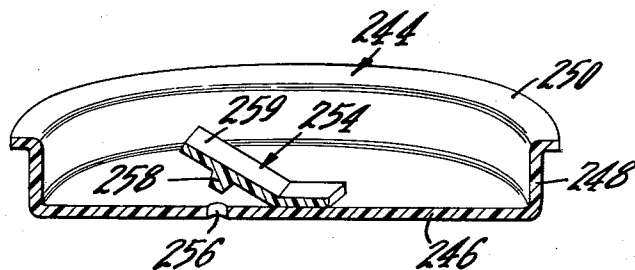


Fig. 8



INVENTOR
ROBERT CORNELIUS STOLK
BY
Frank P. Deata
ATTORNEY

1

3,163,311

CONTAINER

Robert Cornelius Stolk, Fairfield, Conn., assignor to American Can Company, New York, N.Y., a corporation of New Jersey

Filed Dec. 10, 1963, Ser. No. 329,445

9 Claims. (Cl. 215-83)

The present invention relates generally to a container for hermetically sealing food products and more particularly to such a container which includes an easily removable, tamperproof cap member and a sealing element which may be used as a reclosure after the removal of the cap member.

An object of the present invention is to provide an easily openable container for hermetically sealing food products such as instant, concentrated or powdered coffee, tea and milk or the like which may or may not be maintained under vacuum within the container.

Another object is to provide such a container which may be easily opened without the use of an opening tool and which may be readily reclosed after the initial opening thereof to preserve the food product remaining in the container.

A further object of the present invention is the provision of a container for food products maintained under vacuum therein which comprises a sealing element that is so constructed as to allow venting of the vacuum within the container to thereby facilitate removal of the sealing element from the container body.

Still another object is to provide such a container wherein the sealing element may be easily gripped by the consumer for the removal thereof from the container body.

A still further object is to provide such a container having a tamperproof cap member so that the consumer can be assured of the hermetic sealing of the food product within the container.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

FIGURE 1 is a perspective view of a container constructed according to the principles of the instant invention;

FIG. 2 is an elevational view in section of the upper portion of the container shown in FIGURE 1;

FIG. 3 is a view similar to FIG. 2, showing the container after the removal of the cap member therefrom and with the sealing element thereof in a squeezed position just prior to its removal from the container body;

FIG. 4 is an elevational view in section of the upper portion of a modified form of the container shown in FIG. 2;

FIG. 5 is a view similar to FIG. 4, showing the modified container of FIG. 4 after the removal of the cap member therefrom and with the sealing element thereof in a squeezed and venting position;

FIG. 6 is a perspective view in section of the modified container shown in FIG. 4, showing the sealing element when it is used as a reclosure for the container body; and

FIGS. 7 and 8 are perspective views in section of further modified forms of the sealing element shown in FIGS. 2 and 3.

As a preferred and exemplary embodiment of the instant invention, FIGS. 1 and 2 illustrate a container 10 for hermetically sealing a food product P, such as instant, concentrated or powdered coffee, tea and milk or the like, which is maintained under substantially atmospheric pres-

2

sure within the container 10. To preserve the freshness of the food product P, it preferably is sealed within the container 10 in the presence of an inert gas such as carbon dioxide or nitrogen in a conventional manner.

The container 10 comprises an open-ended body 12 preferably of cylindrical shape and made of a substantially rigid, transparent material such as glass. The open or upper end of the container body 12 terminates in an annular bead 14 having a flat upper face 16, a downwardly and outwardly tapering outer face 18 and an undercut face 20 which merges with the outer face 18 in a relatively sharply curved corner 22. The container body 12 further comprises a sloping outer face 24 which merges with the undercut face 20 of the bead 14 to define an annular, approximately V-shaped groove 26 in the body 12.

A tamperproof cap member 28 of an easily tearable material such as aluminum is disposed over the open end of the container body 12 and comprises a flat central panel 30 and a depending holding skirt 32. The holding skirt 32 in turn comprises a downwardly and outwardly extending upper section 34 in engagement with the outer bead face 18, a downwardly and inwardly extending section 36 in engagement with the undercut bead face 20 and merging with the upper section 34 in a rounded corner 38 which is in engagement with and closely conforms to the bead corner 22, and a downwardly and outwardly extending lower section 40 which is in engagement with the outer face 24 and merges with the skirt section 36 to form a V-shaped holding section 42. As shown in FIG. 2, the holding section 42 of the skirt 32 is tightly disposed in the V-shaped groove 26 of the container body 12 to retain the cap member 28 on the container body 12.

In order to hermetically seal the food product P within the container body 12, a sealing or gasket element 44 (FIG. 2) is disposed within the open end of the container body 12 and is formed of a suitable flexible and resilient plastic material such as a polyolefin, e.g., polyethylene or polypropylene; a vinyl resin, e.g., polyvinylchloride; or a suitable polyamide such as nylon. The sealing element 44 comprises a flat, laterally extending central portion 46 disposed within the open end of the container body 12, an upstanding countersink wall 48 merging at its lower end with the central portion 46, and a flange 50 extending laterally outwardly from the upper portion of the countersink wall 48. The outwardly extending flange 50 and the countersink wall 48 are in tight sealing engagement with the flat upper face 16 of the bead 14 and the inner surface 52 of the container body 12, respectively, to hermetically seal the food product P within the container body 12. The central panel 30 and the upper skirt section 34 of the cap member 28 are in tight engagement with the outwardly extending flange 50 of the sealing element 44 to retain the flange 50 in tight contact with the flat upper bead face 16 (see FIG. 2).

The sealing element 44 is provided with a hollow gripping button or knob 54 extending upwardly from and formed integral with the flat central portion 46. The gripping button 54 comprises a flat upper portion 56 disposed below the outwardly extending flange 50 of the sealing element 44, and an annular downwardly and inwardly extending flange portion 58 which merges at its lower end with the inner end of the flat central portion 46. After the removal of the cap member 28 from the container body 12, the gripping button 54 allows the sealing element 44 to be readily removed from the container body 12 in a manner to be described more fully hereinafter.

The cap member 28 is provided with tearing means to facilitate removal thereof as a unitary structure from the container body 12, without requiring the use of an opening tool. The tearing means (FIGS. 1 and 2) comprises

a pair of spaced and diverging curved score lines 60, 62 disposed on the inner face of the central cap panel 30, the score lines 60, 62 terminating at their widely spaced ends adjacent the outer end portion of the central cap panel 30. At their narrowly spaced ends, the score lines 60, 62 extend downwardly through the cap skirt 32 and terminate in a tearing tongue 64 which extends downwardly along the container body 12 beyond the lower skirt section 40.

To facilitate tearing of the tongue 64 through the V-shaped holding section 42 of the cap member 28, the lower skirt section 40 preferably is provided with cut portions or slits 66 adjacent both sides of the tearing tongue 64 and extending to the score lines 60, 62. The cut portions 66 of the lower skirt section 40 serve to insure against the breaking off of the tearing tongue 64 at the beginning of the tearing action through the V-shaped holding section 42 of the cap 28.

While, for the purpose of illustration, the score lines 60, 62 are shown in curved, diverging relationship and on the inner face of the central cap panel 30, it is noted that the score lines 60, 62 may be straight and/or disposed in parallel relationship and/or disposed on the outer face of the central cap panel 30 without departing from the scope of the instant invention.

When it is desired to open the container 10, the consumer first grips the tearing tongue 64 and tears through the cap member 28 along the score lines 60, 62 to the opposite end portion of the central cap panel 30 at which the score lines 60, 62 terminate. Since the V-shaped holding section 42 of the cap member 28 is no longer in firm contact with the container body 12 at the V-shaped groove 26 thereof, the cap member 28 may thereafter be readily lifted from the container body 12.

After the cap member 28 has been removed from the container body 12, the sealing element 44 remains in hermetically sealing relationship with the container body 12 owing to the tight sealing engagement of the countersink wall 48 of the sealing element 44 with the inner surface 52 of the container body 12. To remove the sealing element 44 from the container body 12, the flange portion 58 of the gripping button 52 is squeezed or pressed inwardly as shown in FIG. 3, thereby pulling the flat central portion 46 inwardly and moving the countersink wall 48 substantially out of engagement with the inner surface 52 of the container body 12. The sealing element 44 then may be easily lifted from the container body 12 by pulling upwardly on the gripping button 54 to remove the outwardly extending flange 50 from the flat upper bead face 16.

In the case of a concentrated or other type of food product P which normally is not fully consumed after the initial opening of the container 10, the instant sealing element 44 is especially useful since it may be conveniently used as a reclosure for the container body 12. The sealing element 44 is easily repositioned within the container body 12 by again squeezing or pressing inwardly the flange portion 58 of the gripping button 54 and again moving the sealing element 44 to the position shown in FIG. 3 wherein the outwardly extending flange 50 thereof engages the flat upper face 16 of the annular bead 14 on the container body 12. The gripping button 54 then is released and the countersink wall 48 of the sealing element 44, owing to the resilience of the sealing element material, moves outwardly into tight sealing engagement with the adjacent inner surface 52 of the container body 12 to preserve the food product P remaining in the container 10.

FIG. 4 illustrates a modified form of the container shown in FIG. 2 which is adapted for use with a food product P to be maintained under vacuum to preserve the freshness thereof. The modified container 10a of FIG. 4 comprises a container body 12a and a cap member 28a which are identical in construction to the con-

tainer body 12 and cap member 28, respectively, shown in FIG. 2. The sealing element 44a of the modified container 10a is substantially the same as the sealing element 44 of FIG. 2, except that it is provided with a plurality of venting apertures 57a disposed in and approximately equally circumferentially spaced around the countersink wall 48a thereof.

The sealing element 44a hermetically seals the product P within the container body 12a because of the tight engagement of the countersink wall 48a and the outwardly extending flange 50a with the interior surface 52a of the container body 12a and the flat upper face 16a of the annular bead 18a, respectively. Because of the vacuum within the container body 12a, the upper portion 56a of the gripping button 54a and the flat central portion 46a of the sealing element 44a are bowed or deformed downwardly towards the food product P (see FIG. 4). In order to prevent excessive downward deformation of the central portion 46a, which might result in the pulling of the countersink wall 48a away from the interior body surface 52a a sufficient amount to break the hermetic seal and expose the food product P to the atmosphere through the venting apertures 57a, the upper level L of the food product P preferably is closely adjacent the central portion 46a to support it after a slight inward deformation thereof which is insufficient to break the sealing engagement of the sealing element 44a with the container body 12a.

When it is desired to open the container 10a of FIG. 4, the sealing cap 28a is removed therefrom and the flange portion 58a of the gripping button 54a is squeezed or pressed inwardly as shown in FIG. 5. Opposite portions of the countersink wall 48a in approximately radial alignment with the direction of squeezing thus are pulled out of sealing engagement with the interior surface 52a of the container body 12a to relieve the vacuum therein through the venting apertures 57a in the portions of the countersink wall 48a which are separated from the interior body surface 52a. The sealing element 44a then may be easily lifted from the container body 12a by pulling upwardly on the gripping button 54a.

As shown in FIG. 6, the sealing element 44a may conveniently be used as a reclosure for the container body 12a to preserve the food product P remaining therein. This is accomplished by squeezing the gripping button 54a and repositioning the sealing element 44a within the container body 12a. The gripping button 54a then is released to again bring the countersink wall 48a into tight sealing engagement with the interior surface 52a of the container body 12a. Since there is no longer any vacuum within the container body 12a, there is no pressure differential on the central portion 46a of the sealing element 44a and thus it does not deform downwardly and need not be supported by the food product P.

FIG. 7 illustrates a further modified form of the sealing element 44 shown in FIGS. 2 and 3 for use in containers wherein the food product therein is maintained under vacuum. The sealing element 144 of FIG. 7 comprises a countersink wall 148 and an outwardly extending flange 150 which are identical in construction to the countersink wall 48 and outwardly extending flange 50, respectively, of the sealing element 44. The lower portion of the countersink wall 148 merges with a central panel or portion 146 having a solid gripping button 154 extending upwardly therefrom and preferably formed integral therewith. Since the gripping button 154 is solid, it cannot be utilized to move the countersink wall 148 out of tight engagement with the adjacent interior surface of the container body 12 when the sealing element 144 is positioned thereon.

To facilitate the removal of the sealing element 144 from the container body 12, therefore, it is desirable to provide for the venting of the vacuum in the container 10 prior to the removal of the sealing element 144 from the container body 12. This is accomplished by providing a

5

venting aperture 156 in one side of the central panel 146. A sealing tape 158 of any suitable material such as plastic or paper is adhesively secured to the central panel 146 to seal the venting aperture 156. The sealing tape 158 preferably is secured to the central panel 146 by a pressure sensitive adhesive so that it may be lifted sufficiently to uncover the venting aperture 156 (see FIG. 7) when it is desired to remove the sealing element 144 from the container body 12 and so that thereafter it again may be pressed into sealing engagement with the central panel 146 to close the venting aperture 156 when the sealing element 144 is to be used as a reclosure.

FIG. 8 illustrates another modification of the sealing element 44 shown in FIGS. 2 and 3 for use in containers wherein the food product is maintained under vacuum. The sealing element 244 of FIG. 8 comprises a countersink wall 248 and an outwardly extending flange 250 which are identical in construction to the countersink wall 48 and outwardly extending flange 50, respectively, of the sealing element 44. A central panel or portion 246 merges with the lower portion of the countersink wall 248 and is provided with a venting aperture 256 therein. A gripping strip 254 of a plastic material similar to that of the sealing element 244 is adhesively secured at one end portion 255 to the central panel 246 in any suitable or conventional manner. The undersurface of the gripping strip 254 is provided with a sealing plug 258 which is so positioned and constructed as to be receivable in the venting aperture 256 to seal it when the free portion 259 of the gripping strip 254 is pressed against the central panel 246.

When the container 10 is initially opened by removal of the cap member 28 from the container body 12, the sealing element 244 thereafter is removed from the container body 12 by pulling upwardly on the free portion 259 of the gripping strip 254 to remove the plug 258 from the venting aperture 256. The vacuum within the container 10 is thus vented to the atmosphere and the sealing element 244 may easily be lifted from the container body 12 by pulling upwardly on the gripping strip 254. When the sealing element 244 is used as a reclosure, the plug 258 is again inserted in the venting aperture 256 by pressing the free portion 259 of the gripping strip 254 against the central panel 246.

The instant container in its preferred or modified forms is particularly advantageous in that the cap member thereof is tamperproof to assure the consumer that the food product is hermetically sealed within the container, and the sealing element thereof may conveniently be used as a reclosure to preserve the food product remaining in the container after the initial opening thereof.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A container for hermetically sealing a product under vacuum, comprising:
 - a generally cylindrical container body having an open end,
 - an annular bead on said container body adjacent said open end thereof, and
 - a flexible and resilient sealing element disposed within said body end and comprising:
 - a laterally extending central portion disposed below said open body end,
 - a countersink wall extending upwardly from said central portion and in sealing engagement with the adjacent interior surface of said container body,
 - a flange extending laterally outwardly from said coun-

6

- tersink wall and in engagement with the upper portion of said annular bead,
 - means in said sealing element for venting the vacuum in said container body, and
 - a gripping portion extending upwardly from said central portion to facilitate removal of said sealing element from said container body and reclosing of said container body with said sealing element.
2. The container of claim 1 wherein said gripping portion comprises a hollow button having a depending flange portion integrally connected to said central portion, said venting means comprises a plurality of venting apertures in said countersink wall, and said depending flange portion is deformable laterally inwardly when said button is gripped to move said countersink wall laterally inwardly out of engagement with the adjacent interior surface of said container body to vent the vacuum in said container body through said venting apertures.
 3. The container of claim 1 wherein said gripping portion comprises a solid button integrally connected to said central portion, said venting means comprises a venting aperture in said central portion, and a sealing tape is adhesively secured to the outer surface of said central portion over said venting aperture to seal the same and to maintain the vacuum in the container.
 4. The container of claim 1 wherein said gripping portion comprises a flexible and resilient strip having an end portion thereof adhesively secured to said central portion, and wherein said venting means comprises a venting aperture in said central portion, the free portion of said gripping strip being disposed over said venting aperture and having a plug on the undersurface thereof positioned in said venting aperture to seal the same and to maintain the vacuum in the container.
 5. A flexible and resilient sealing element for hermetically sealing a product under vacuum in a container body having an open end, said sealing element comprising:
 - a generally laterally extending central portion adapted to be disposed within the container body below the open end thereof,
 - a countersink wall extending upwardly from said central portion and adapted to engage the adjacent interior surface of the container body,
 - a flange extending generally laterally outwardly from said countersink wall and adapted to engage the upper portion of the container body adjacent the open end thereof,
 - means in said sealing element adapted to vent the vacuum in the container body, and
 - a gripping portion extending upwardly from said central portion and adapted to facilitate removal of said sealing element from the container body and reclosing of the container body with said sealing element.
 6. The sealing element of claim 5 wherein said gripping portion comprises a hollow button having a depending flange portion integrally connected to said central portion, said venting means comprises a plurality of venting apertures in said countersink wall, and said depending flange portion is adapted to be deformed laterally inwardly when said button is gripped to move said countersink wall laterally inwardly out of engagement with the adjacent interior surface of the container body to vent the vacuum in the container body through said venting apertures.
 7. The sealing element of claim 5 wherein said gripping portion comprises a solid button integrally connected to said central portion,

7

said venting means comprises a venting aperture in said central portion, and
 a sealing tape is adhesively secured to the outer surface of said central portion over said venting aperture to seal the same.

8. The sealing element of claim 5 wherein said gripping portion comprises a flexible and resilient strip having an end portion thereof adhesively secured to said central portion, and

said venting means comprises a venting aperture in said central portion,

the free portion of said gripping strip being disposed over said venting aperture and having a plug on the undersurface thereof positioned in said venting aperture to seal the same.

9. A sealed package comprising:

a generally cylindrical container body having an open end,

a food product under vacuum in said container body, an annular bead on said container body adjacent said open end thereof, and

a flexible and resilient sealing element disposed within said body end and comprising:

a laterally extending central portion disposed below said open body end,

5

10

15

20

25

8

a countersink wall extending upwardly from said central portion and in sealing engagement with the adjacent interior surface of said container body, a flange extending laterally outwardly from said countersink wall and in engagement with the upper portion of said annular bead, and

a gripping portion extending upwardly from said central portion,

said sealing element having venting means formed therein,

said central portion being deformed downwardly under atmospheric pressure into engagement with the upper surface of said food product in said container body, whereby said food product prevents excessive downward deformation of said central portion to maintain said countersink wall in sealing engagement with the interior surface of said container body.

References Cited in the file of this patent

UNITED STATES PATENTS

2,716,504	Martin	Aug. 30, 1955
2,773,622	Augensen	Dec. 11, 1956
2,803,367	Antal	Aug. 20, 1957
2,916,174	Orr	Dec. 8, 1959