

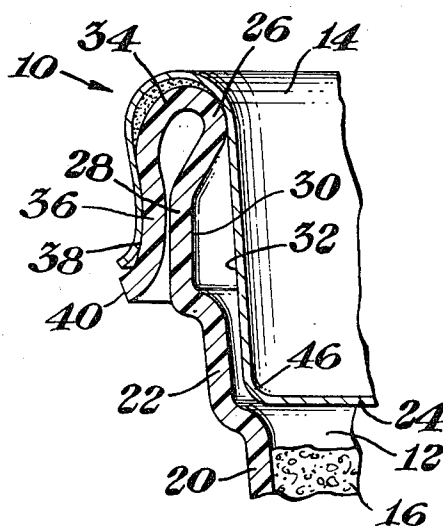
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[45] Patented **Dec. 29, 1970**
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[56] **References Cited**
UNITED STATES PATENTS
3,315,872 4/1967 Carbone..... 229/43
3,362,575 1/1968 Fotos..... 220/97
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[54] **SEALED CONTAINERS**
8 Claims, 4 Drawing Figs.

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229/5.6; 220/67
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B65d 3/06
[50] Field of Search..... 229/1.5,
5.6, 43; 220/67, 97

ABSTRACT: A nestable thin-walled container for hot vacuum packaging of perishable food products. The container includes a thin-walled thermoplastic tub having a turned rim which includes recesses on both sides thereof to receive in a crimped fashion an overlying rim of a metallic lid to form an end seal, whereby creeping of the plastic from out of the sealed end seam is avoided.



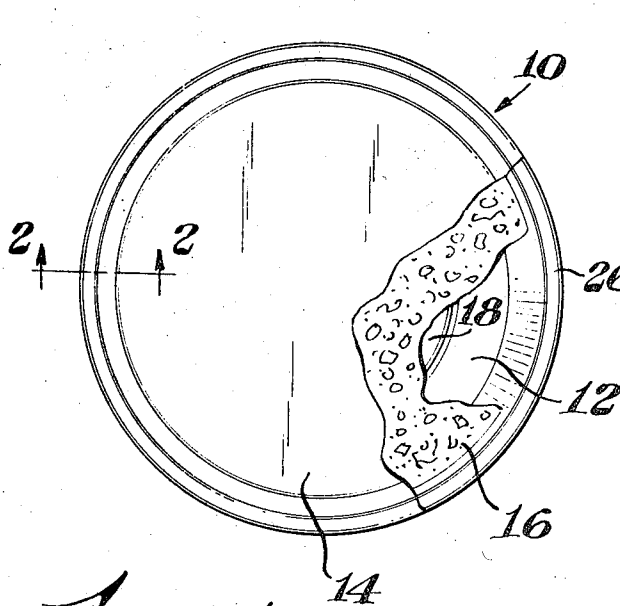


Fig. 1

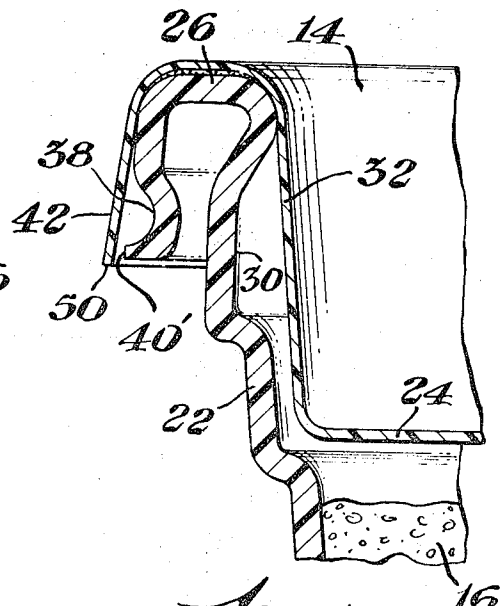


Fig. 4

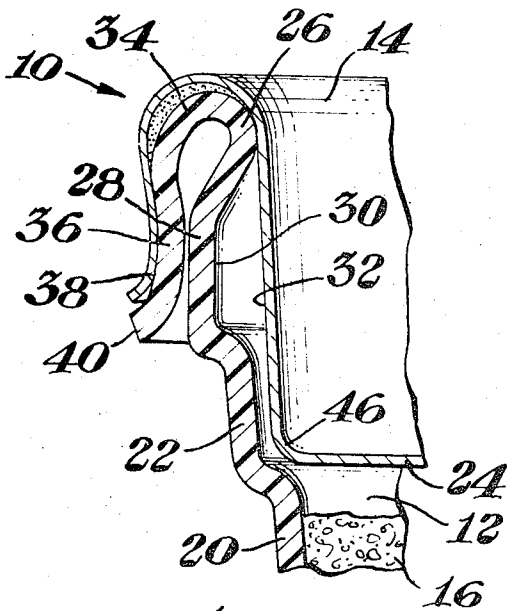


Fig. 2

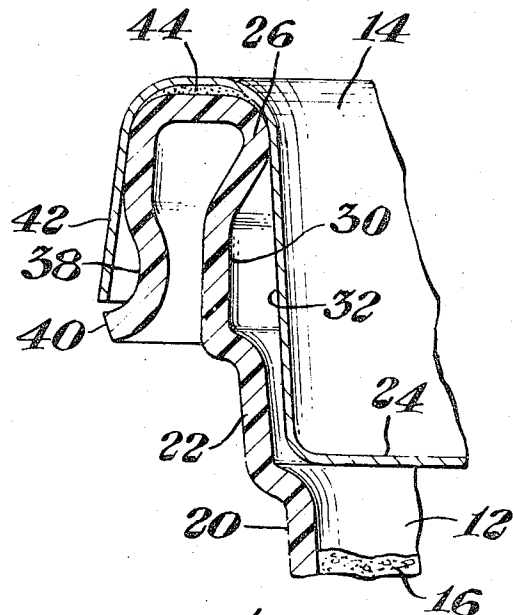


Fig. 3

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SEALED CONTAINERS

DISCLOSURE OF THE INVENTION

In the past, containers for receiving hot vacuum packed foods have almost universally been made of metal, such as are commonly referred to as "tin cans". It is necessary in such containers that there be a hermetic seal between the lid and the container and that this seal be maintained for a considerable length of time to effect a package having a satisfactory shelf life. Efforts to make tubs for such containers out of a thermoplastic material, to be capped hermetically with a metallic lid, have required that the plastic material which forms the container be of an especially heavy material, i.e., considerably thick, thereby increasing the cost of the container material, such as illustrated by Canadian Pat. No. 623,368, for example.

When a metallic lid is crimped and seamed over the open end of a thermoplastic tub, the peripheral end of the plastic material is caused to thin out by cold flow. In the teaching of the Canadian patent, the material thickness is sufficient to accept this. Such cold flow would be unacceptable in a thin-walled tub, however.

For example, if one were to go to relatively thin-walled containers, such as taught in U.S. Pat. No. 3,396,868, it would be necessary to turn the bead or rim to give it sufficient body and strength. Because the material is so thin, cold flow, i.e., excessive thinning, can become a considerable problem. If one were just to crimp a lid around such a rolled rim, the cold flow would eventually cause the rim to loosen and the hermetic seal would be lost.

Other problems in hot pack containers of the prior art center about interference between the material of the tub and that of the inner lower corner of the lid, such that tight closing to form the hermetic seal is difficult. The ability to reclose such containers once opened has been customarily lacking.

Accordingly, it is an object of the present invention to form a novel thin-walled thermoplastic tub having a special rim configuration which can receive a crimped metallic or thermoplastic lid for hot vacuum packaging of foods, whereby the lid forms a hermetic seal with the peripheral opening of the tub and significant cold flow is prevented in the thermoplastic material of the tub in the seal area.

It is another object of this invention to provide a hermetically sealed container which assures that the top rim portion of the tub will close against the upper inside part of the lid to provide a seal against an adhesive used therebetween.

Yet another object of this invention is to provide a hermetically sealed container which can be readily reclosed once opened.

Still another object of this invention is to accomplish the above and other objects with a specially designed rounded rim so that better dimensional control can be had during production of the container of this invention.

Briefly, the present invention concerns a hermetically sealed container having a tub formed of a thermoplastic material having cold flow characteristics, which tub, by a turned rim configuration, is adapted to receive a crimped metallic or thermoplastic lid, the lid and the novel rim preventing cold flow of the thermoplastic material once a hermetic seal is formed. This is accomplished by forming adjacent indented circumferential portions extending towards one another in a generally inverted U-shaped tub rim, the inner indented portion providing a protruding surface towards which the outer indented portion is pressed when the lid is crimped thereon to prevent cold flow of the plastic material. This, in combination with pressure-sensitive adhesive sealing material located between the lid and the top of the rim, forms a hermetic seal which is suitable for hot vacuum packaging for food products and the like.

Yet additional objects and advantages of the present invention are even more apparent when taken in conjunction with the accompanying drawing in which like characters of

reference designate corresponding material and parts throughout the several views thereof, in which:

FIG. 1 is a plan view of a filled container, with a portion of the lid and food product being broken away, illustrating the principles of the present invention;

FIG. 2 is an enlarged cross-sectional view, taken along reference line 2-2 of FIG. 1, of the aforesaid container illustrating how its lid is hermetically sealed with its tub in accordance with the principles of the present invention;

FIG. 3 is an enlarged cross-sectional view of the container, like FIG. 2, only showing the lid and tub just prior to their being crimped together; and

FIG. 4 is a view like FIG. 3 only showing a modified form of container.

Referring now more particularly to the embodiments of FIGS. 1-3, there is shown a container 10 comprising a tub 12 and a cup-shaped lid 14. The container 10 is shown in FIGS. 1 and 2 as being hermetically sealed by a hot vacuum process and containing a food product 16, which food product is of the type which would be subject to quick deterioration by exposure to the atmosphere. Tub 12 is a thin-walled thermoplastic container, such as the type generally taught by U.S. Pat. No. 3,396,868, for example. Typically, such a tub 12 is formed of polystyrene, polyethylene, polypropylene, an ABS copolymer, or other like materials. Such materials can be readily thermoformed by vacuum techniques and are relatively inexpensive, when compared with metal, due to the thinness of the sheet material required in their formation. Lid 14 can also be formed of the same thermoplastic materials, but is here illustrated as being formed of thin gauge sheet metal material except for the embodiment of FIG. 4, wherein it is formed of a thermoplastic material.

Tub 12, in its configuration as shown, has a bottom wall 18 and, extending upwardly therefrom and inclined generally outwardly from the bottom of the tub to its top, a circumferential sidewall 20. Stepped outwardly at the upper end of the sidewall 20 is a circumferential band 22, the lower end of the band being coincident generally with the lower end 24 of the lid 14.

Band 22 extends upwardly until it meets tub rim 26, the tub rim 26 commencing with an outwardly extended circumferential indented portion 28 defining a recess 30 considerably spaced from sidewall 32 of lid 14. Extending upwardly from portion 28 and inwardly therefrom is the rolled section 34 of the tub rim 26, which rolled portion extends downwardly into the flange 36. Flange 36 is generally S-shaped defining a recess or undercut 38 ending in an outwardly flaring tail 40.

Referring now more particularly to FIG. 3, there is shown the tub 12 and lid 14 in their initially formed state before the lid 14 is crimped with the rim 26 of the tub. Lid rim 42 is of a generally inverted U-shaped configuration providing close contact with the uppermost part of the tub rim. Lid rim 42 ends closely adjacent to the end 40 of the tub rim 26. Across the top of tub rim 26 can be included an adhesive sealant 44 of the type commonly used in sealing hot vacuum packed containers.

In going from the uncrimped position shown in FIG. 3 to the crimped position shown in FIG. 2, an ordinary lid crimping device is used. This forces the outer flange of the lid rim 42 into the recess 38 of the tub rim 26 and also causes a bending and partial closing of the topmost part of the tub rim 26. A slight space or no space at all between the closing recesses 38 and 30 of the tub rim 26 occurs with such crimping.

Viewing the crimped container, as best shown in FIG. 2, it can be seen that the band 22 and recess 30 remove any interference of material between the container and the inner lower corner 46 of the lid 14. By avoiding interference in this area, it can be assured that the top of the tub rim 26 will close against the upper inside part of the lid rim 42 to provide a seal against the adhesive in the lid, and will put the container into tension. Both the band 22 and recess 30 also provide additional hoop strength in the container.

The recess or undercut 38 in the exterior flange portion of the tub rim 26 provides a place into which the outer flange portion of the lid rim 42 may be crimped. By providing this recess, it is a certainty that the seamed-on lid will remain locked onto the rim instead of only flattening the rim out as would be the case if the tub rim were straight without the undercut. This undercut also provides a place into which the edge of a metal lid like lid 14 may be tucked to hide the sharpness of the edge, although not here shown.

By providing the slight outwardly flared portion 40 of the tub rim 26, the lid, once it has been removed, may be easily replaced because there will be a snap-in cooperation between the recess 38 and the crimped flange 42. This reclosable feature is highly desirable since unused product must be kept until another time.

Also highly important to the concept of this invention is the fact that by having properly designed the lid to fit closely over the tub rim, both on the inside and outside of the tub, and after seaming the lid onto the tub, the type of seal obtained resists any significant cold flow or creep of the tub rim. The lid fit apparently causes tension in the inner rim surface of the tub and, after the seaming operation, the outer rim surface of the tub is in compression. In other words, the lid is squeezing the tub rim.

Another advantage of the present invention which is not directly the design function is that related to the manufacturing function. By not using a conventional curled rim one will be readily able to maintain during production a greater degree of dimensional control over the tub. Such control permits high efficiency in production and more uniformity in the containers supplied to the customer.

The modification in the form of the invention shown in FIG. 4 rests primarily in the lower outer portion of the tub rim 26. Here the outwardly flaring section 40' is made thinner and shorter than the lowermost extent 50 of lid rim 42. This will permit the raw edge 50 of the lid to be tucked under the flange of the tub rim. The rim 14 is, in this case, made of a thermoplastic material which can be the same as that used in the tub. Heat softening of the lid rim area is generally required to effect the sealing and crimping of the lid to the tub rim. In its other effects, the embodiment of FIG. 4 is like that shown in FIGS. 1—3 and like characters of reference have been applied to designate corresponding portions.

Accordingly, it will be apparent to those skilled in the art that various changes can be made therein without departing from the spirit and scope of this invention.

I claim:

1. A nestable thin-walled container for hot vacuum packaging of perishable food products subject to deterioration by ex-

posure to the atmosphere, said container comprising a thin-walled thermoplastic tub having a bottom wall, a circumferential sidewall extending upwardly and inclined outwardly from said bottom wall, an indented circumferential portion extending upwardly and defining a first recess spaced outwardly from said sidewall and forming part of a generally inverted U-shaped tub rim at the upper peripheral end of the tub, said tub rim including a flange extending downwardly from the top of said rim at least as far as said first recess and having an indented portion defining a circumferential second recess extending towards said first recess, said tub adapted to be capped by a lid having a generally inverted U-shaped rim fitting closely over the tub rim and crimp sealed therewith.

2. The container of claim 1 wherein a circumferential band is located above said sidewall and below said first mentioned indented portion, said band being adapted to be spaced from the lid sidewall and the lower end of which is adapted to be generally coincident with the lower end of the lid.

3. The container of claim 1 wherein said food product is located in said tub, said lid is capped on said tub and crimp sealed therewith, the crimp formed in said lid rim being indented into said second recess of said tub rim, thereby rendering said container hermetically sealed and reclosable once opened.

4. The container of claim 3 wherein an adhesive sealant is located between said tub rim and lid rim to further insure said hermetic seal.

5. The container of claim 3 wherein said lid is formed of a metallic material.

6. The container of claim 3 wherein said lid is formed of a thermoplastic material.

7. The container of claim 2 wherein said flange extends below the lower end of the lid rim.

8. A nestable thin-walled container for hot vacuum packaging of perishable food products subject to deterioration by exposure to the atmosphere, said container comprising a thin-walled thermoplastic tub having a bottom wall, a circumferential sidewall extending upwardly and inclined outwardly from said bottom wall, an indented circumferential portion extending upwardly and defining a first recess spaced outwardly from said sidewall and forming part of a generally inverted U-shaped tub rim at the upper peripheral end of the tub, said tub rim including a downwardly extending flange having a generally S-shaped section defining a circumferential indented second recess extending towards said first recess and ending in an outwardly flaring tail, said tub adapted to be capped by a lid having a generally inverted U-shaped rim fitting closely over the tub rim and crimp sealed therewith.

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