United States Patent [19]

McCormick et al.

[11] **3,722,731**

[45] ***Mar. 27, 1973**

[54] **INSET COVERALL LID FOR CONTAINERS**

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[73] Assignee: **The Dow Chemical Company,** MIdland, Mich.

[*] Notice: The portion of the term of this patent subsequent to June 29, 1988, has been disclaimed.

[22] Filed: **May 4, 1970**

[21] Appl. No.: **34,380**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 827,219, May 23, 1969, Pat. No. 3,589,552.

[52] **U.S. Cl.** .....**220/60,** 220/97 F, 229/43, 99/171 S

[51] **Int. Cl.** **B65d 43/10**

[58] **Field of Search** .....99/171 R, 171 S, 171 C; 220/42 C, 60, 97 R, 97 F, 97 C; 206/65 K; 229/43; 222/143

[56] **References Cited**

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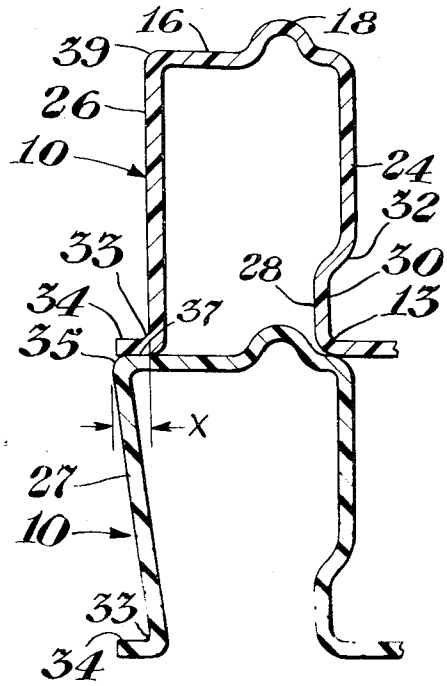
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[57] **ABSTRACT**

An improved thermoformed plastic inset coverall lid for use with a container for food products or the like. The lid includes inclined stacking bosses around its peripheral rim so as to prevent jamming. A locating ring about the top surface of the lid rim is employed to maintain the lids aligned in a free stack to maximize benefit of the stacking bosses.

5 Claims, 5 Drawing Figures



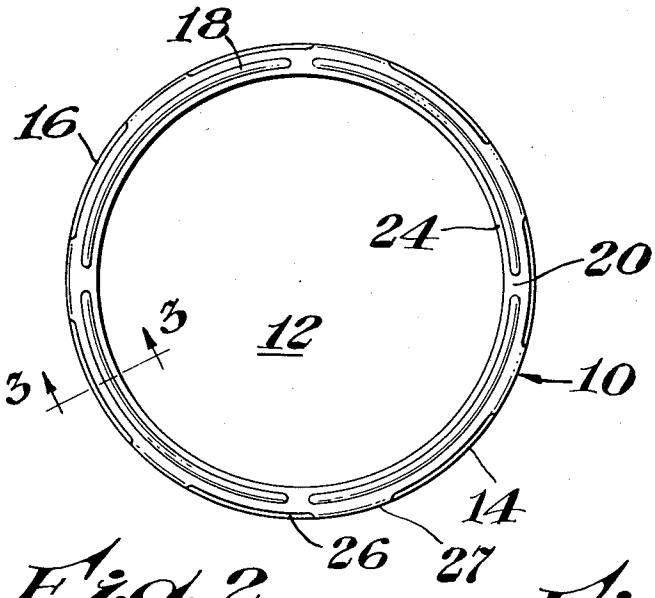


Fig. 2

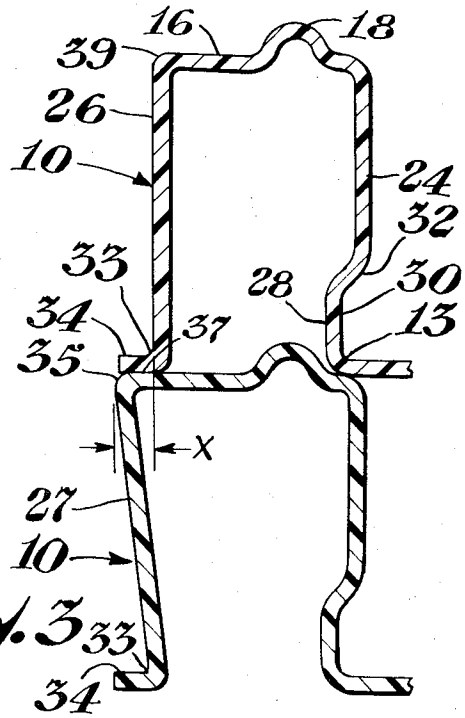


Fig. 3

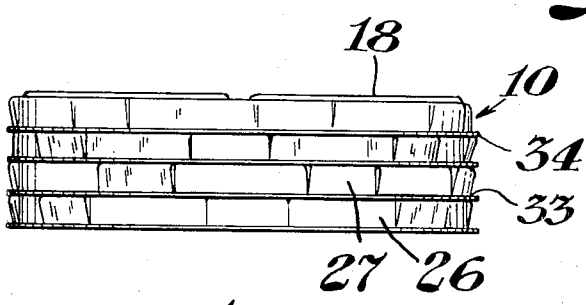


Fig. 1

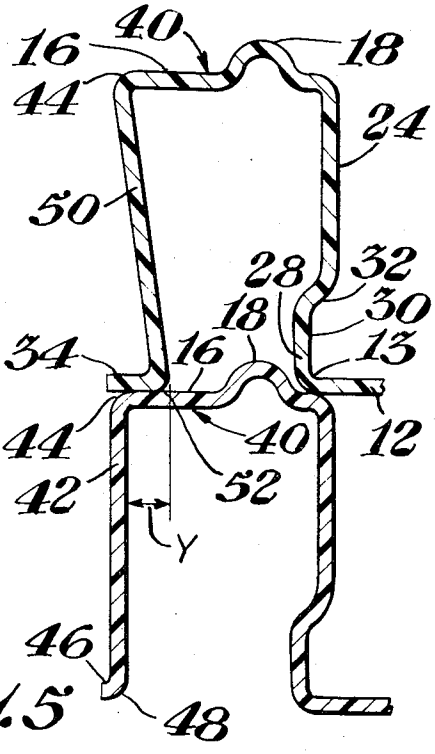


Fig. 5

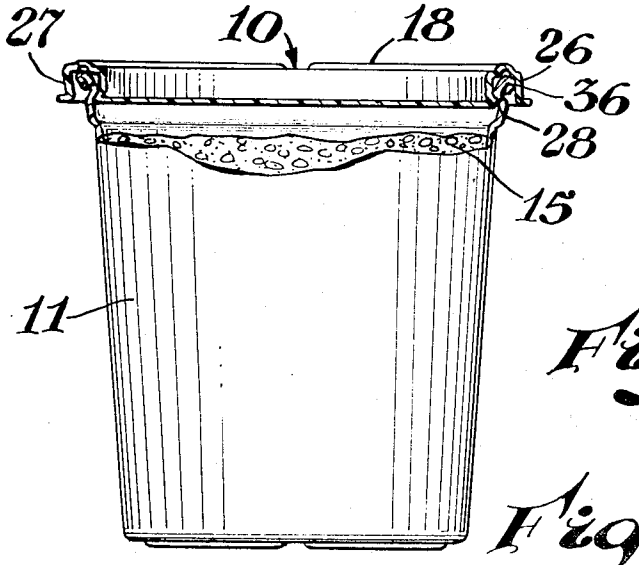


Fig. 4

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INSET COVERALL LID FOR CONTAINERS

This is a continuation-in-part of U.S. application Ser. No. 827,219, filed May 23, 1969, now U.S. Pat. No. 3,589,552.

DESCRIPTION OF THE INVENTION

The type of containers for which the lid of the present invention is directed are those customarily designed to hold yogurt, ice cream, sherbets, salads, cottage cheese, fruit, nuts and other food or like products, which containers are usually sold in the grocery stores. This invention has particular application to inset coverall lids and the tubs to which they are applied, which lids and tubs can be thermoformed from homopolymers, copolymers, blends and/or multilayers of styrene, ethylene, acrylonitrile-butadiene-styrene, saran and certain other thermoplastic resins which provide a container that is sturdy, attractive, and possesses reasonably good barrier properties against undesirable vapor and gas transmissions for the particular product. For example, what is commonly referred to as "high impact polystyrene" is often used for such containers when they contain yogurt.

Inset coverall lids for containers are ordinarily stacked one upon the other and are coin fed from the stack when they are to be placed on the tubs for which they provided a cover. An example of such is taught in U.S. application Ser. No. 827,219, filed May 23, 1969, entitled "Containers", by the same inventors and assigned to the same assignee as is the present invention, now U.S. Pat. No. 3,589,552, and the subject matter of which is hereby incorporated in its entirety by reference. When in this nested stack, lids of the prior art have had a tendency to jam, particularly if significant compressive forces are directed against a stack of such lids. Such jamming of nested lids requires at the minimum the attention of an individual to remove the jammed lids and in some cases can cause shut downs of production lines when the containers are being filled and closed. Since the rate at which the lids are applied to tubs is great, even a short shut down period can involve loss of production of many containers.

Accordingly, it is among the objects of the present invention to provide a novel improved thermoplastic coverall lid for use on tubs which lids include a stacking boss feature that positively prevents jamming of the lids when in a nested stack. An additional object of the present invention is to provide a locating ring and cooperating bead about the lids's rim in combination with said stacking boss feature so that the lids can be nested generally in alignment to permit the stacking bosses to function most effectively.

Briefly, the present invention comprehends an inset coverall lid having a generally inverted U-shaped rim. The external flange or leg of the rim includes inclined stacking bosses around the extent of the rim which stacking bosses are formed by intermittently either (1) extending the rim's outer flange from its top to adjacent its bottom or (2) indenting the rim's outer flange from adjacent its top to its bottom, which extension or indentation is for an extent greater than the material thickness forming the external flange. A locating ring is formed intermittently about the bight portion of the lid rim to aid in keeping the lids aligned in a stacked relationship to maximize effectiveness of the stacking bosses. A bead along the inside peripheral flange of the lid rim cooperates with the locating ring to accomplish such alignment of the nested stack.

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 side elevational view of a nested stack of lids constructed according to the present invention;

FIG. **2** is a top view thereof;

FIG. **3** is an enlarged fragmentary cross-sectional view thereof taken along the line **3—3** of FIG. **2**, the stack being limited to two such lids for illustrative purposes;

FIG. **4** is an elevational view, with parts broken away, of one such lid engaged with a tub to form a completed container; and

FIG. **5** is a view like FIG. **3** only showing a modified lid structure.

Referring more particularly to FIGS. **1** to **3**, lids **10** are generally thermoformed of a thermoplastic material as previously described, and are of the type called inset coverall lids. They have a central annular base **12** and a generally inverted U-shaped rim **14**. The rim comprises a bight portion **16** and extending downwardly therefrom an external flange **26** and an internal flange **24**. About the bight portion **16** is a locating ring **18** which is interrupted at surfaces **20** to permit venting between nested lids as described in more detail in the aforesaid copending U.S. Pat. application.

The outer peripheral edge of planar portion **12** meets at juncture **13** with internal flange **24** at bead **28**. Bead **28** includes a generally vertical leg **30** and inclined leg **32**. Leg **30** is offset outwardly from flange **24** at least one thickness of material of the flange **24** and preferably **2** to **5** times the thickness of the material.

In its normal disposition external flange **26** is generally vertical and extends downwardly from bight portion **16** to foot **34**. Stacking boss **27** in the embodiment shown in cross section in FIG. **3** protrudes outwardly from external portion **26** from its top then downwardly and inwardly to adjacent its bottom. The juncture **33** between the foot **34** and the stacking boss **27** is at the same location that the juncture **33** is for the external flange **26** and the foot **34**. This means that the juncture **35** between the bight portion **16** and the stacking boss **27** is outwardly extended a distance X (as shown in FIG. **3**) from the juncture **39** between the bight portion **16** and the external flange **26**. This distance X provides for a more positive stacking by giving the foot **34** a greater horizontal ledge **37** upon which to seat.

The cooperation of bead **28** with lid ring **18** assures general alignment of two lids **10** together so that maximum efficiency is obtained for stacking between adjacent nested lids. That is, the leg **34** of the next highest lid will be generally located in alignment with and resting upon the maximum distance X of the next lower lid's stacking boss **27**. This distance X of the extended ledge **37** of bight portion **16** can vary. Preferably it is at least as great as one material thickness of the flange **26** and preferably two to five times in thickness, if not more.

FIG. 4 shows the engagement of the lid **10** with the top rim **36** of tub **11** containing food product **15** located therein. On the right hand cut through it can be seen that the external flange **26** fits up tight against the outer extent of rim **36**, while the stacking boss **27** is spaced outwardly slightly therefrom as can be seen from the top left of FIG. **4**. This spacing, of course, does not interrupt the securing of the lid with the tub because stacking bosses are only intermittently located around the external flange **26**. It has been found preferable, but not critical, to have the stacking boss account for less than half of the peripheral distance around the external flange. Preferably they do extend for more than one quarter of the peripheral distance in order to give enough benefit for the stacking feature.

In the modified embodiment of the present invention found in FIG. **5** features having similarity to those described with respect to FIG. **3** bear the same reference characters. The chief difference lies in the external flange and stacking boss of the modified lid **40**. Lid **40** includes an external peripheral flange **42** extending downwardly from juncture **44** with bight portion **16** and ending in an extremely short horizontally disposed leg **46** extending from juncture **48**. Intermittently spaced around the peripheral extent of external flange **42** are stacking bosses **50**. Stacking bosses **50** extend downwardly and are inclined inwardly from the juncture **44** with the bight portion **16**, to a juncture **52** with horizontally disposed leg **34**. Leg **34** is substantially greater in length than the horizontal leg **46**. The juncture **52** is disposed inwardly from the juncture **48** a distance Y to provide for positive stacking between nested lids. The dimension Y is at least one material thickness of the external flange **42** and preferably two to five times or more in thickness. The distance Y so increases the length of leg **34** so that it has a very positive seating with the bight portion **16** of the lid rim which seating is maintained due to the alignment achieved between the cooperation of the bead **28** with the locating ring **18**, as previously described.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope of the invention.

Accordingly, what is claimed as new is:

1. A snap-in thermoplastic lid for a container, said lid adaptable for coin feeding and comprising an annular base joined with a generally inverted U-shaped rim, said rim defined by generally vertically downwardly extending external and internal flanges of generally equal length traversed by a generally horizontal bight portion, said external flange including inclined stacking bosses located intermittently about its periphery, the degree of inclination of said stacking bosses from the generally vertical portion of said external flange being greater than the material thickness forming the external flange, a locating ring extending upwardly from the bight portion of the rim, a bead along the inside peripheral flange of the rim adjacent said annular base, and a generally horizontal leg extending outwardly from the bottom of said external flange a distance at least two times the material thickness of said flange to provide a more positive stack, said locating ring and bead cooperatively aligning a plurality of said lids stacked one on the other and whereby said horizontal leg prevents jamming of the lids even in the event said locating ring and bead fail to precisely align said lids.

2. The lid of claim **1** wherein said stacking bosses extend outwardly from the top of the generally vertical portion of the external flange and then downwardly and inwardly to adjacent its bottom.

3. The lid of claim **1** wherein said stacking bosses extend inwardly and downwardly from the top of the generally vertical portion of the external flange to its bottom.

4. The lid of claim **1**, a plurality of other like lids wherein each of the lids is in nested relationship with the others in an aligned stack, the stacking bosses providing a greater horizontal contact between the feet of said external flanges and the horizontal ledges of the bight portions.

5. The lid of claim **1** wherein the same is thermoformed from high impact polystyrene resin.

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Disclaimer

3,722,731.—*Robert J. McCormick* and *Charles E. Fitzgerald*, Findlay, Ohio. INSET COVERALL LID FOR CONTAINERS. Patent dated Mar. 27, 1973. Disclaimer filed Sept. 12, 1972, by the inventors.

Hereby disclaims the portion of the term of the patent subsequent to June 29, 1988.

[*Official Gazette October 23, 1973.*]