

Feb. 25, 1964

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3,122,264

NESTABLE ARTICLE

Filed Feb. 9, 1962

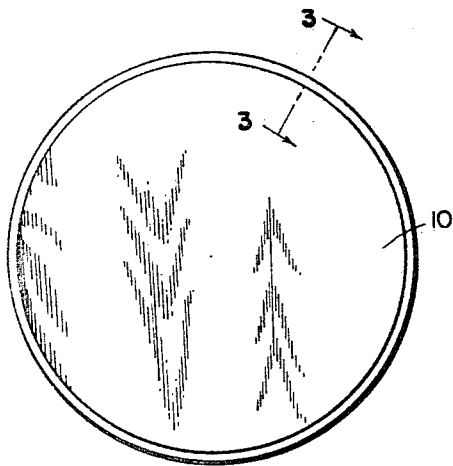


FIG. 1



FIG. 2

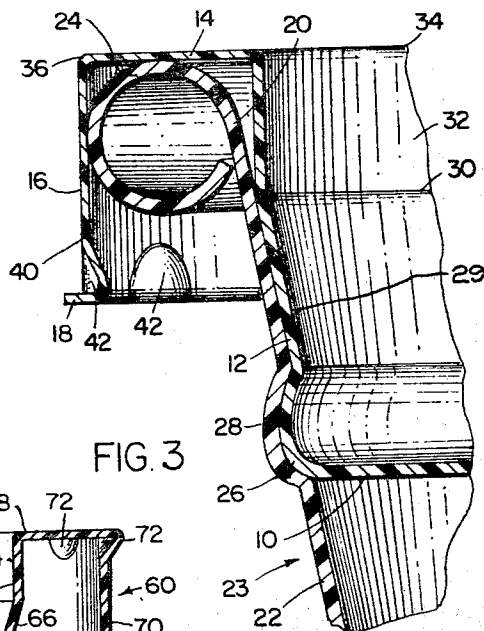


FIG. 3

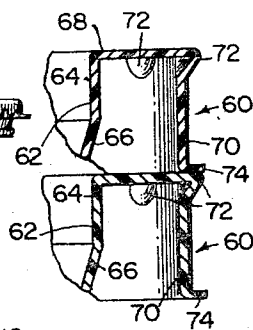


FIG. 4

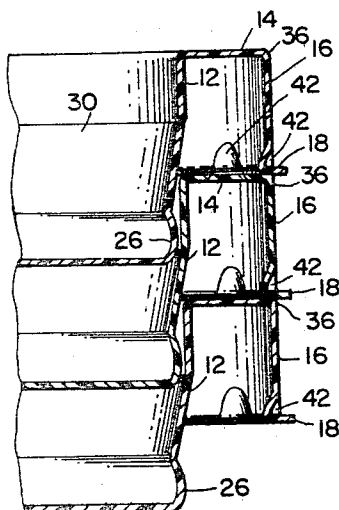


FIG. 5

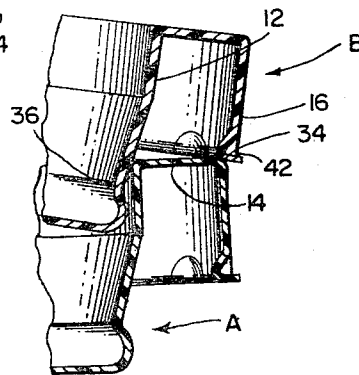


FIG. 6

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3,122,264

NESTABLE ARTICLE

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Filed Feb. 9, 1962, Ser. No. 172,315
7 Claims. (Cl. 220-97)

This invention relates to container covers and more particularly comprises a new and improved disposable plastic lid for drinking cups, which stacks or nests with like lids.

To reduce the unit cost of throw away items such as plastic cups and covers, such items are made of very thin thermoplastic materials which are quite flexible. While such material does not interfere with the performance of the primary function of the items, it does produce problems in the handling of such items in bulk. For example, when the articles are stacked or nested together, their flexible character often causes one article to bind upon the adjacent nested article so that the two do not readily separate. When this occurs it interferes with the operation of automatic feeding mechanisms used in packaging equipment and the dispensing of such articles in vending machines.

One important object of this invention is to provide a cover or lid of the type used as closures for cups and similar containers, which nests without binding on other like lids.

Another important object of this invention is to provide a disposable lid for drinking cups, which sits firmly without tipping on the top of an identical lid so that a reasonably steady stack is produced by a series of nested lids.

To accomplish these and other objects, the lid of this invention is provided with a side wall and a surrounding skirt joined together at their tops by a horizontal flange. Formed on the skirt at its periphery are inwardly extending protuberances that seat on the flange of a like lid disposed beneath them. The protuberances are spaced from the outer surface of the side wall a distance less than the radial width of the flange which joins the skirt and side wall so that the flange of one lid does not fit into the space between the skirt and flange of the next upper lid in the stack.

These and other objects and features of this invention along with its incident advantages, will be better understood and appreciated from the following detailed description of two embodiments thereof, selected for purposes of illustration and shown in the accompanying drawing in which:

FIG. 1 is a plan view of a lid constructed in accordance with this invention;

FIG. 2 is a side view of the lid shown in FIG. 1;

FIG. 3 is a cross sectional view taken along the corresponding section line in FIG. 1 and showing the manner in which the lid serves as a closure for a cup;

FIG. 4 is a fragmentary cross sectional view of a stack of lids constructed in accordance with this invention;

FIG. 5 is a fragmentary cross sectional view illustrating the manner in which the formation of the lids resists wedging of one lid within another; and

FIG. 6 is a fragmentary cross sectional view of a stack of lids constructed in accordance with another embodiment of this invention.

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The lid illustrated in the drawing includes a bottom wall 10, a side wall 12, an upper horizontal flange 14, a skirt 16 and flange support 18. These parts make up a lid which is adapted to fit within the mouth 20 formed by the side walls 22 of a cup 23 or other container, to form a seal with the interior of the container and enclose and/or form an additional seal with the container rim 24.

The bottom wall 10 which may be smooth or alternately be provided with some form of seat or lip to engage the bottom of a cup stacked upon it, is joined to the side wall 12 by a bead 26 adapted to fit within the recess 28 in the wall 22 of the cup to seal the container mouth. The lower portion 29 of side wall 12 extends upwardly and outwardly from the bead 26, and the wall turns at bend 30 to provide a cylindrical section 32 immediately beneath flange 14. The inner diameter of the cylindrical portion 32 of the side wall is greater than the outer diameter of the bead 26 so that the bead of one lid may be slipped within the side wall of another lid beneath it. It will be noted in FIG. 4 that the diameter of the cylindrical portion 32 of each side wall is such that it comfortably receives the bead of the next upper lid in the stack.

The cylindrical portion 32 of the side wall is joined to the flange 14 in a relatively sharp corner 34, and the skirt 16 is similarly joined to the outer edge of the flange 14 at sharp corner 36. As the skirt 16 and the cylindrical section 32 are disposed normal to the lid axis, they form right angles with the flange 14.

The outer taper of the portion 29 of side wall 12 in an upward direction from the bead 26 preferably is the same as or less than the taper of the container wall 22 at its mouth 20. If the taper is the same as the mouth 20 of the container, then the portion 29 may contact the container wall over a substantial distance, and this engagement plus the firm contact between the bead 26 and the recess 28 will provide a most satisfactory closure. This closure may be further enhanced by contact of the lower face of flange 14 and the inner surface of the skirt 16 with the rim 24 of the container 23 at the two points shown in FIG. 3.

Formed in the lower end 40 of the skirt 16 at supporting flange 18 are a plurality of inwardly extending protuberances 42 which narrow the effective inner diameter of the skirt 16 at its bottom. While in the drawing the protuberances are shown to be confined to the lower portion 40 of the skirt 16 and to be spaced about the skirt, the protuberances may extend upwardly over a substantial part or the full height of the skirt 16 and may form a continuous bead about the entire lower portion.

As shown in FIG. 4 the supporting flange 18 and particularly that portion of the flange which forms the bottom or lower end of the protuberances 42 literally support the lid in which they are formed on the lid below, and particularly on that lid's outer edge of flange 14 at the sharp corner 36. When one lid is placed upon another, the outer portion of the top flange 14 forms a seat for the protuberances and lower supporting flange 18 and firmly supports the lid above it. It will be noted that when a lid is supported in that manner upon the next lower lid in a stack the bead 26 of each lid does not engage the wall 12 of the next lower lid but rather is spaced a short distance from it. It is desirable that the bead 26 be spaced from the wall 12 when the lids are stacked so as to cause the entire support for the lids to be dependent

upon the engagement of the protuberances and supporting flanges with the upper flanges of the next lower lid. When supported in this manner a very stable column results and no tipping of the lids is experienced, as does occur when the bead 26 forms the contacting or supporting element with the inner inclined wall of the next lower lid.

In FIG. 5 the manner in which the special configuration of the lid opposes or prevents an interlocking of nested lids is shown. It will be noted that the horizontal flange 14 of the lower lid A cannot fit within and therefore be bound by the side wall 12 and the skirt 16 of the upper lid B in the stack. The flange 14 cannot fit within the region of the side wall and skirt of the next upper lid because the width of the flange 14 exceeds the gap between the outer surface of the side wall 12 and the innermost points of the protuberances 42. Thus, even when the upper lid B is markedly tilted as suggested in FIG. 5 the sharp corners 34 and 36 which define the limits of the horizontal flange 14 interfere with the insertion of the flange into the region between the side wall and skirt by bearing against the outer surface of the side wall and the innermost point of the protuberances. Only by a substantial pressure which would likely permanently deform the lids can the lids become locked or bend one upon another in any way so as to prevent one lid from dropping from the next upper lid when external support is removed from it. It should also be appreciated that only under extraordinary conditions can lids be disposed angularly in the relative position shown in FIG. 5 as there is no tendency for the lids to tip in any way because they are supported in a prescribed parallel relationship at the flanges and protuberances.

In the embodiment of FIG. 6, the protuberances formed on the bottom of the skirt of the lids in the preferred embodiment are replaced by similar protuberances on the top of the skirt at the corner joining the skirt and flange. Otherwise, the embodiments may be identical. Thus, each lid 60 shown in FIG. 6 includes a side wall 62 having an upper vertical section 64 and a lower inclined portion 66, a horizontal flange 68, and a skirt 70. The protuberances 72 formed at the corner joining the skirt and flange define a seat for the lower edge of the skirt or supporting flange 74 of the next upper lid in the nest. The relative relationship of the lids in the nest is the same as that of the preferred embodiment and the protuberances 72 may be spaced or form a continuous bead about the skirt.

While the embodiment of FIG. 6 functionally produces the same results as the preferred embodiment of this invention, it does have certain limitations particularly in the manufacturing operation. For example, when the lid is formed on a die, some difficulty may be encountered in removing the lid after it is formed because the protruding segments of the die which initially shape the protuberances 72 will interfere with the withdrawal of the skirt. The protruding portions of the die may stretch the skirt or otherwise cause some deformation.

The thickness of the lid stock is approximately .010 inch, and is a flexible thermoplastic such as polystyrene. The size of the protuberances is that which may be achieved without incurring permanent deformation of the lid when it is withdrawn from the mold on which the lid is formed. It is suggested that the size approach the maximum as the greater the size of the protuberances the greater the supporting contact between the adjacent nested lids at their periphery.

Having described this invention in detail, those skilled in the art will appreciate that numerous modifications may be made of this invention without departing from its spirit, and that the invention may be incorporated into articles of manufacture such as cups and containers as well as lids. Therefore, it is not intended that the breadth of this invention be determined by the two embodiments illustrated and described. Rather, the breadth of this invention is to be determined by the appended claims and their equivalents.

What is claimed is:

1. A lid for containers comprising
 - a bottom wall,
 - a side wall joined to the periphery of the bottom wall,
 - a bead formed at the junction of the side and bottom wall,
 - said side wall being upwardly and outwardly flared with its horizontal span at its bottom being less than the span of the bead and with its horizontal span at its top being greater than the span of the bead,
 - an outer skirt spaced from and surrounding the side wall and joined with the side wall at the top,
 - said skirt having a vertical height greater than the vertical distance between the bottom of the flared side wall and the level of the side wall where its inner horizontal span is equal to the span of the bead,
 - and inwardly extending protuberances formed on the bottom of the skirt and lying closer at their innermost points to the outer surface of the side wall horizontally opposite said protuberances than the distance between the outer surface of the skirt and the inner surface of the side wall at their tops.
2. An article of manufacture comprising
 - a bottom wall,
 - a side wall extending upwardly from the periphery of the bottom wall,
 - an outwardly extending flange formed at the top of the side wall,
 - a depending skirt secured to the outer edge of the flange, and inwardly extending means disposed on the skirt and adapted to rest upon the flange of a like lid beneath it when the lids are nested together in parallel planes, said means and outer surface of the side wall at points horizontally opposite one another lying closer together than the width of the flange.
3. A lid comprising
 - a bottom wall,
 - a side wall extending upwardly and outwardly from the periphery of the bottom wall and having an inner diameter at the top larger than the outer diameter of the junction of the bottom and side walls,
 - a downwardly extending skirt joined to the top of the side wall by an outwardly extending flange,
 - and inwardly extending protuberances provided on the bottom of the skirt and adapted to support the lid upon a like lid disposed beneath it with the bottom wall of the lid and a like lid in parallel planes and with the side wall of the lid lying within and free of contact with the side wall of said like lid beneath it, the space between the protuberances and the outer surface of the side wall horizontally opposite one another being less than the horizontal width of the flange.
4. A lid as defined in claim 3 further characterized by the upper portion of the side wall and the skirt being disposed normal to the bottom wall.
5. A lid as defined in claim 3 further characterized by said protuberances including a horizontal supporting flange which extends outwardly from the innermost portion of the protuberances to a point beyond the outer surface of the skirt.
6. An article of manufacture comprising
 - a bottom wall,
 - a side wall extending upwardly from the periphery of the bottom wall,
 - an outwardly extending flange formed at the top of the side wall,
 - a depending skirt secured to the outer edge of the flange,
 - and means provided in the skirt at one extreme thereof and adapted to engage the opposite extreme of the skirt of a like article nested with it when the bottom walls of the lid are parallel and maintain the side walls of the two articles free of contact with one another,

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said flange having a greater effective width than the space between the bottom of the skirt and the side wall.

7. An article of manufacture as defined in claim 6 further characterized by

said means comprising outwardly extending protuberances at the upper edge of the skirt where it joins the flange and adapted to engage the lower edge of a skirt of an article nested above it,

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said protuberances forming part of the effective width of the flange.

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