

- [54] SNAP-ON LID
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- [73] Assignee: **Continental Can Company, Inc.**, New York, N.Y.
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- [21] Appl. No.: **357,423**

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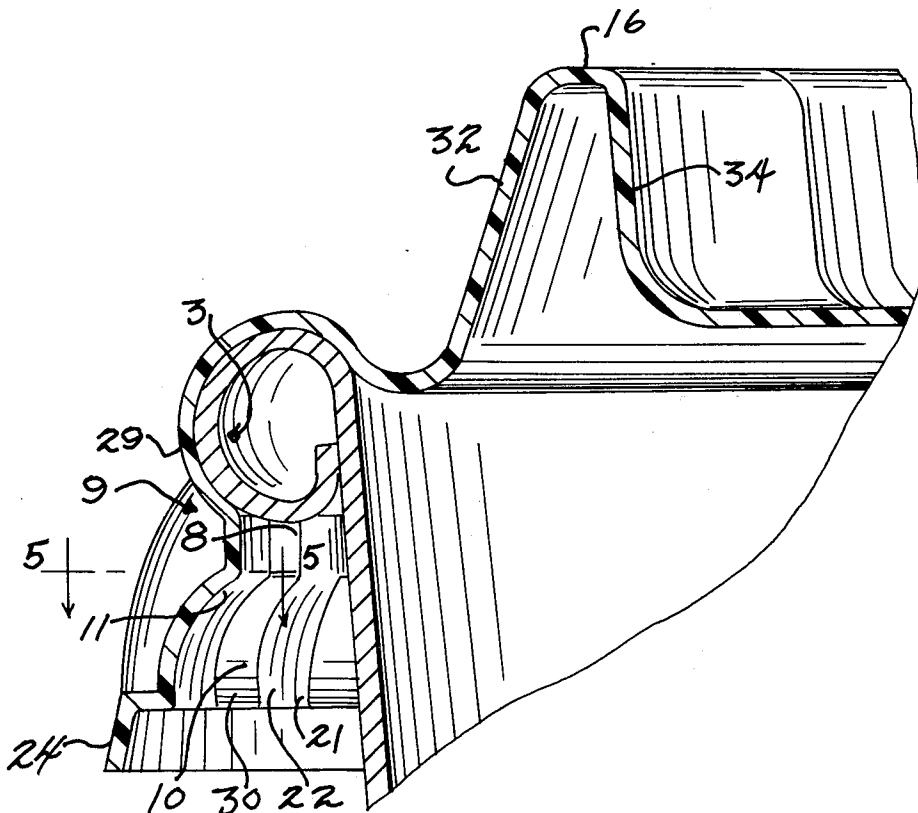
- [52] U.S. Cl. 220/306; 206/519; 229/43
- [51] Int. Cl.. B65d 43/10; B65d 21/02; B65d 41/18
- [58] Field of Search 220/60 R; 229/43; 206/515, 206/519, 520

- [56] **References Cited**
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[57] **ABSTRACT**

A plastic snap-on cover for use with a disposable cup having a lip about its upper edge. The snap-on cover has a central panel with a raised annular ring about the edge of the panel. Notches in the ring serve to furnish an anti-locking feature for stacking as well as provide an anti-sloshing feature to the ring when the lid is used as a coaster. The skirt of the snap-on lid has an inner elongated arcuate shaped land to provide a nesting and anti-shift feature to the detent means of the snap-on lid.

17 Claims, 8 Drawing Figures



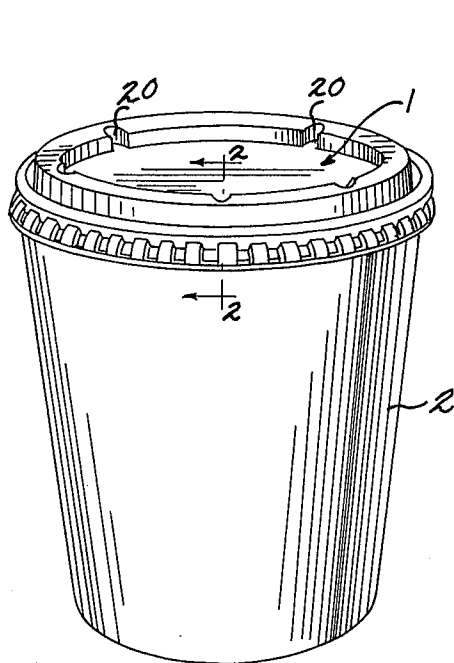


FIG. 1

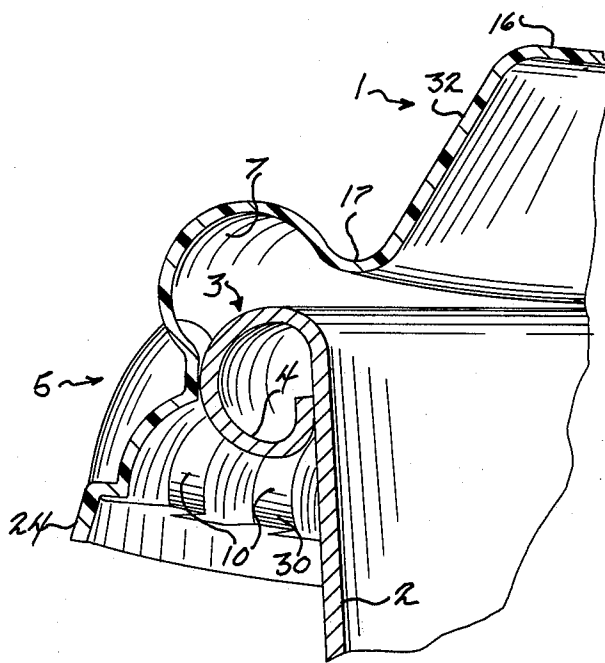


FIG. 3

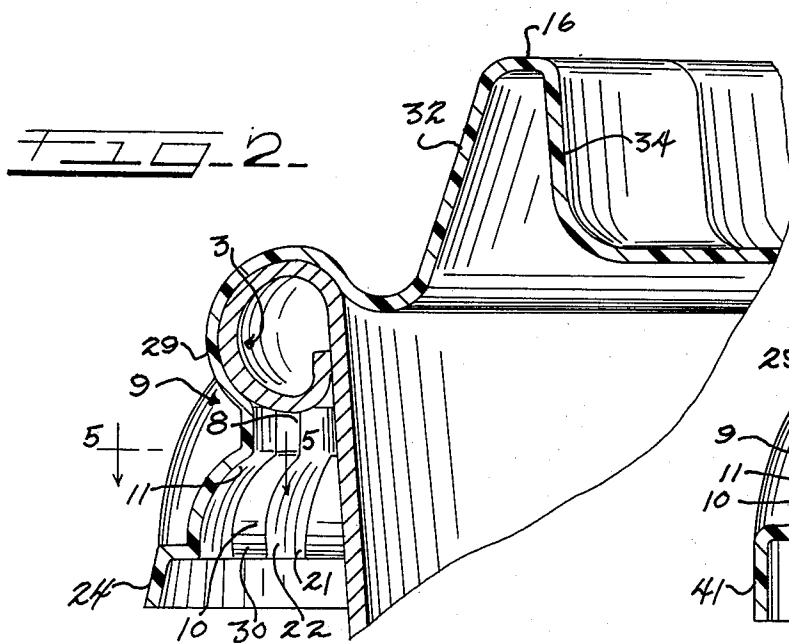


FIG. 2

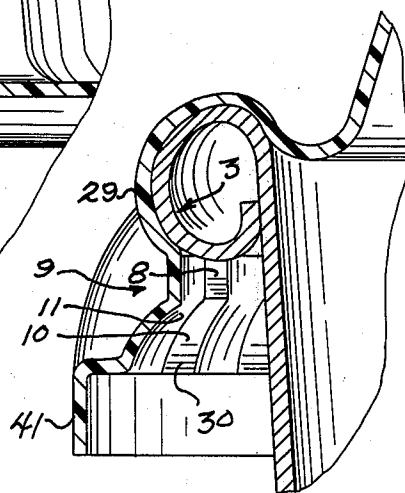


FIG. 8

FIG. 4

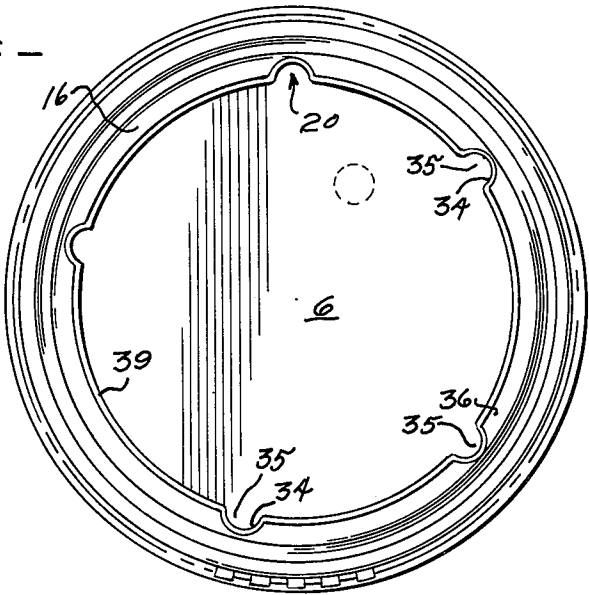


FIG. 6

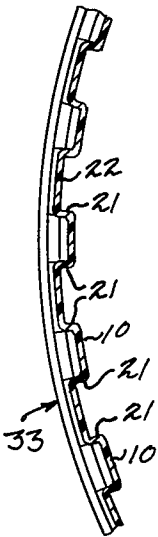
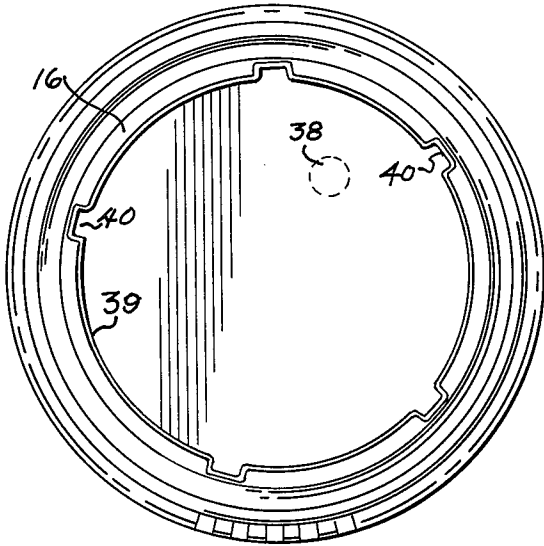
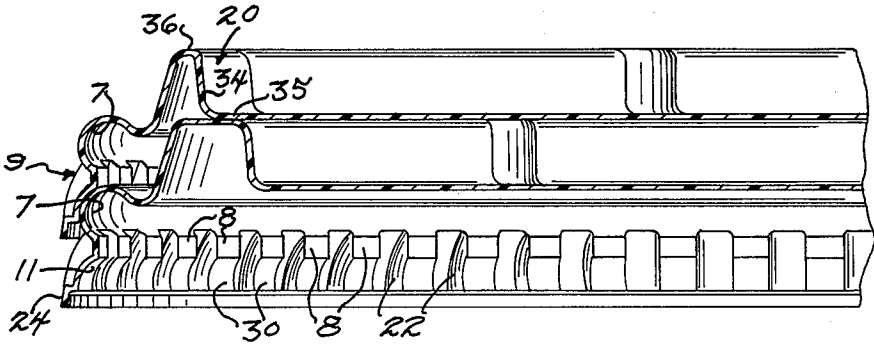


FIG. 5

FIG. 7



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SNAP-ON LID

Our invention relates to a new and useful improvement in the container art, and more particularly, to a novel plastic snap-on reclosure cover for a container having a bead about its upper edge.

A primary object of the invention is to provide a novel plastic cover having detent means for holding the plastic cover onto the bead about the upper edge of the container.

Another object of our invention is to provide a lid having notches in a raised annular ring for stacking and having a skirt and peripheral channel which dovetail one on the other so as to avoid lateral shifting and sticking of stacked lids.

With the above and other objects in view, the nature of the invention is more clearly to be understood by reference to the following detailed description, claims and the several views illustrated in the accompanying drawings.

FIG. 1 shows a perspective view of a container provided with a cover formed in accordance with our invention;

FIG. 2 shows an enlarged fragmentary vertical sectional view taken along the section line 2—2 of FIG. 1;

FIG. 3 shows an enlarged fragmentary vertical sectional view similar to the view of FIG. 2 but showing a cover in the process of being seated onto or lifted from the container bead;

FIG. 4 is a plan view of the cover showing a first type of detent lug;

FIG. 5 shows a cross-sectional view of the lid skirt taken along the line 5—5 of FIG. 2;

FIG. 6 is a plan view of the cover showing a second type of detent lug;

FIG. 7 shows a vertical cross-sectional view of a stack of snap-on covers of this invention; and

FIG. 8 shows an enlarged fragmentary vertical sectional view similar to FIG. 2 of a second embodiment of our invention.

This invention relates to plastic covers or lids which are adapted for use with containers having a bead about the upper edge of the container. Such a combination of lid 1 and container 2 is shown in FIG. 1. The container in FIG. 1 may be a paper, plastic or plastic covered paper drinking cup or the like having an external bead around its upper margin. The cover or lid 1 of the invention is mounted hereon. Any container 2 that has a bead around its upper edge may have the lid fitted over it in a fashion similar to that shown in FIGS. 1 and 2. The drinking cup or whatever container used requires a suitable size lid to fit snugly over its upper rim. The cup or container is of a conventional known structure and it is understood that any such structure having a bead 3 around its edge may be used with the lid of our invention.

While FIG. 1 shows a perspective view of the lid 1 in place on a container 2 of some sort, a more detailed showing of the construction of the outer margin of our invention with its snap-on lid 1 is shown in FIG. 2. The plastic cover is shown snapped on over the container bead. This container bead 3 may be an annular roll 4 located around the top of the container and is of a more or less uniform thickness around the top of the container.

The cover in FIG. 1 is snapped onto the container. It has a depending peripheral generally cylindrical skirt 5

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located around its outer margin to form a garter spring structure. The depending peripheral skirt extends downward from the margin of the central panel 6 or top wall of the lid and an inverted peripheral channel 7 connects top wall 6 to the peripheral skirt 5. The inverted peripheral channel 7 has a circumferentially spaced generally vertically arranged shaped extensions 8 formed at the lower wall portion of channel 7 to form a waist 9 on the lower inner wall of the inverted peripheral channel. The waist 9 (FIG. 2) is formed by the extensions and a lower elongated arcuate inner surface or land 10 is arranged below each extension. The waist acts as a detent structure made up of a series of retention lugs. The elongated arcuate inner surface 10 acts as a land for guiding the container bead into and out of the inverted channel 7. The upper part of the elongated arcuate surface forms a shoulder 11 on the land 10. The waist 9 provides for a snug fit of the lid or cover 1 over the upper edge of the container 2 when the closure cover is fitted face down over the bead 3. As shown in FIG. 2, the periphery of the container bead 3 forms a seal against lid 1.

A raised annular portion 16 is shown in FIGS. 1-3 and 7 as projecting above the top wall 6. Inverted channel 7 is connected to annular portion 16 by an arcuate bead 17 which extends around the channel forming a link between it and the annular portion. The raised annular portion 16 stiffens cover 1. The cover 1 is made of a relatively light plastic material. For this reason, any large cover needs stiffening against folding. The indentations or notches 20 shown internally of the raised annular portion are used to prevent lids from sticking together when they are stacked. The structure for stacking is discussed in greater detail in succeeding paragraphs.

The series of extended portions 8 snap under the cup bead when the snap-on cover is in place to form a detent means. Extending from the lower portion of channel 7 to the left as seen in FIGS. 2 and 3 the peripheral conical skirt 5. The interior arcuate shaped lands 10 plus the extended portions 8 mentioned above, the connecting lateral walls 21, connecting back wall 22, the angled lower rim 24 all comprise the skirt. The connecting lateral walls 21 and connecting back wall 22 between the arcuate shaped members 10 which walls form part of the exterior of the conical skirt are actually U-shaped walls to form the exterior ribs 33. The walls 21 are paired on each side of each arcuate shaped member 10 and their upper ends connect to the extended portions 8 while their uppermost end portions connect to the lower and outer wall 29 of the inverted channel (FIG. 7). The channel itself is a continuous rounded section. The back wall 22 has side walls 21 attached at each side along its length. The top of the back wall 22 connects to the outer wall 29 of the inverted channel. The bottom of the back wall connects to the angled lower rim 24.

It is readily seen from observing FIGS. 2 and 7 that the lower part 30 of the arcuate shaped member 10 has an inside diameter which is greater than the maximum outside diameter of the channel 7. The difference of these diameters is somewhat greater than the wall thickness of the cover. When a cover is fitted onto a container, the lower edge 30 of the cover fits over a container bead 3 and the lands 10 provide an interior camming surface inside the lower part of the arcuate shaped member. As the cover 1 is forced down over the

container bead 3 (FIG. 3) the lands 10 engage the bead 3 all around the cover and as the lands move further downward, the arcuate shaped member 10 and waist 9 may flex laterally to allow the elongated part of the lower arcuate member to slide over the exterior of the bead. The bead 3 then fits into the inverted peripheral channel 7 to form a snug nesting similar to that shown in FIG. 2. In practice, the channel and bead do not fit with perfect precision due to irregularities of material and forming.

During process of snapping the cover 1 onto the container 2, the cover assumes a configuration something like that shown in FIG. 3. The elongated arcuate member 10 and related parts act as a spring both when the lid is being snapped onto the container and when it is being removed from the top of the container. These parts deform somewhat with the retention lugs of the waist 9 being flattened a bit as the bead passes the waist. The principal springing action is imparted by the outward motion of the skirt 5 before the container bead 3 is snapped under the waist and into the channel.

The paired lateral walls 21 are flexed also. Since these paired lateral walls 21 normally are curved and flat, their flexure simply imparts a greater curvature to each wall. The peripheral channel 7 and skirt 5 look somewhat similar to the showing in FIG. 3. Here the waist 9 is a bit distorted as the portions 8 pass over round bead 3 and waist 9 is forced back when it passes over the bead. Rim 24 helps to prevent splitting of the skirt when it is forced on over the bead 3.

The use of a conically shaped skirt allows the skirt 5 to fit close to the side of the cup 2. This configuration minimizes the risk of accidentally popping off a cover. An example of an instance where this feature is of importance is when filled cups are placed into carryout bags or carryout trays. The trays and bags are made to close tolerances and force the cups into close proximity—often with overlap of cover. If a skirt with a flare is used then an adjacent cover may lodge under the flared skirt and in moving upward dislodge the upper cover from its container. By use of the skirt which hangs close to the wall of the container, there is a smaller chance that an adjacent cover will lodge under the skirt. The waist 9 of this type skirt extends further under the bead and makes a more firm fit of the cover under the bead.

A plan view of our snap-on closure or lid is shown in FIG. 4. In the center of the lid is a flat top wall 6 which extends laterally to include the raised annular portion 16. The raised annular portion 16 is formed into the top wall 6 and the outer wall 32 of the raised annular portion has a sloping surface as shown in FIGS. 2 and 3. An arcuate cross-sectional bead 17 is at the bottom of the slope and connects the outer wall of the raised annular portion 16 to the inverted peripheral channel 7. The inverted peripheral channel 7 connects the arcuate cross-sectional bead 17 to the peripheral cylindrical skirt 5 which is the outermost element. Ribs 33 are of about one eighth inch in width and are equally spaced at about 54 positions around the peripheral cylindrical skirt 5 where the cover has a diameter of about 3 5/8 inches. Stacking ledges or notches 20 are located in the raised annular portion 16 and the sides 34 of each notch slope at a small angle. The ribs 33 around the periphery of the lid have a flat U-shaped cross section (FIG. 5). The stacking notches 20 are spaced at unequal intervals around the annular portion 16 in a

manner to most readily avoid dovetailing of the notches one in the other when the lids 1 are stacked one upon the other as shown in FIG. 7. The spacing of these notches is 75°, 90°, 75° and 50°, respectively. Each of the notches 20 occupies a space extending about half way through the radius of the raised annular portion 16. Each notch 20 is located in the inside wall of the annular portion and has a flat bottom wall 35. When the covers are stacked, the bottom 35 of the notch lies on the top wall 36 of the raised annular portion 16 (FIG. 7).

The shape of walls 21, 22 of the ribs 33 are shown in cross section in the view of FIG. 5. However, neither the vertical shape of the ribs nor of the elongated vertical curve which constitutes the arcuate shaped member (land) 10 is shown in FIG. 5. A vertical section across them is found in FIGS. 2, 3 and 7. The flat U-shaped rib 33 is relatively easy to form and itself presents a U-section as does the inner spring portion forming the waist 9.

A full vertical cross section of a cover taken along the line 7—7 of FIG. 4 (where FIG. 4 is a stacked pair of covers) is shown in FIG. 7. The waist 9 is made up of a series of tooth-like projections 8 extending into the interior of the cover. A notch 20 is shown in vertical cross section. The back wall 34 extends upward from the flat bottom wall to the upper wall 36 of the annular raised portion 16.

The vertical distance from the top 36 of the annular section to the top of the bottom wall 35 of the notch is about equal to the vertical distance from the top of the channel 7 to the top of the shoulder 11.

The notches may be rectangular in shape as shown by the notch 40 of FIG. 6. The location of these notches has the same spacing around annular ring 16 as in FIG. 4 and for the same reason.

When the lids are nested one on top of the other, they form a stack similar to that shown in FIG. 7. It is readily appreciated that the stacking ledges or notches 20 lie against the upper surface 36 of the annular section 16. Also the bottom wall of the shoulder 11 falls onto the top wall of the inverted channel 7. The covers 1 are held apart mainly by the stacking notches or ledges 20 and are held from sliding in relation to each other by a close fit between the lower part 30 of the arcuate shaped member and the outer part 29 of the inverted peripheral channel 7. Thus, the inner part of the arcuate member has a dual function. The first function is that the land 10 engages the outer edge of the container bead 3 when the snap-on reclosure cover 1 is pressed over this edge. The diameter of the lower outer wall 30 is slightly larger than the diameter of the container bead to guide the container bead upward. The second function is that when the lids are stacked, the inner intermediate portion or shoulder 11 rests against the outer wall of the inverted channel 7. The lowest inner wall surface 30 of the arcuate member guides and engages the container bead as the cover is pressed onto the container. As the cover 1 is pressed onto the container bead, most of the bead slides directly and easily by the waist and into the inverted channel 7 and remains there. The last portion of the waist 9 to pass over the bead 3 encounters resistance from bead 3 and deforms somewhat to pass over the bead. Bead 3 also deforms inwardly. The amount that the bead 3 deforms depends largely on the softness or hardness of the material from which the container 2 is made compared

with the material of the cover 1. In any case, the last portion of the skirt 5 to snap on turns outward somewhat while it is passing over the bead. At this time, the skirt is turned outwardly somewhat as shown in FIG. 3. The outer rim 24 of the skirt is placed in tension and elongates somewhat. The skirt does not split because the tension and elongation are to some extent distributed around the entire rim. A material which has appropriate forming and elongation characteristics is Hi-Impact Styrene.

Straw slot 38 is located in the top wall 6 (FIGS. 4 and 6). This slot may be of any sort; for example, an arcuate weakening means or cross cuts to form a localized weakened area. This area may be pressed inward to allow a straw to be inserted.

When a container is carried, it is frequently tipped. If the straw slot 38 has been opened, the liquid in the container may flow out of the straw slot. The liquid may spill onto hands, car seats or clothing. In our cover, this spillage is caught by the inner wall 34 of the raised annular ring 16. Thus, annular section 16 acts as a stiffener for the cover, a spacer for stacked covers and a retaining wall for liquid spilled out of the straw slot. Ring 16 is located interiorly of bead 17 and bead 17 provides a secondary wall against spilling of liquid from the straw slot.

When the cover is used as a coaster the cover is placed so that the coaster rests on rim 24. The cup is set in the cover and any liquid spillage falls within the annular ring 16.

In the embodiment shown in FIG. 8, the configuration of the lid is almost the same as the configuration of the lid of FIG. 2. The rim 41 of FIG. 8 is analogous to the rim 24 of FIG. 2. However, rim 41 is about one and two tenths longer in vertical dimension than the rim 24 and the land 10 is shortened by very nearly the amount that the rim is lengthened. The distance from the high point of inverted peripheral channel 7 to the bottom of the rims 24 and 41 is identical in the embodiment of FIGS. 2 and 8.

Among the advantages of this invention is the spring action of the detent means. Another advantage is the use of irregularly spaced stacking ledges about an annular raised portion to avoid dovetailing on stacking. Still another advantage is the shape of the inner surface of the skirt which in conjunction with the outer surface of the skirt and the outer surface of the channel gives lateral stability and vertical support to lids which are stacked one on another. Finally, the raised annular portion improves the rigidity and stacking quality of the lid.

The foregoing is a description of illustrative embodiments of the invention, and it is applicant's intention in the appended claims to cover all forms which fall within the scope of the invention.

We claim:

1. A snap-over cover for containers having an external peripheral bead around the upper edge thereof, said cover being formed of an easily flexed material and comprising:

a top wall;

a depending peripheral conical skirt;

an inverted peripheral channel connecting said top wall to said peripheral skirt for receiving the external peripheral bead formation of a container;

an arcuate in cross section bead intermediate said top wall and said channel and having an inner edge and an outer edge;

a plurality of circumferentially spaced inwardly directed projections formed in said skirt and adapted to form a waist to underlie the peripheral bead of a container to retain the cover thereon and form spring pressed detent means; and

an inwardly facing arcuate land below each projection extending normal to said channel and shaped to provide a camming surface when forcing the cover onto a container and to matingly fit onto the outer side of the channel of another cover stacked in nested relation therewith to prevent lateral movement between nested covers.

2. A snap-over cover for containers having an external peripheral bead around the upper edge thereof, said cover being formed of an easily flexed material as set forth in claim 1 in which said top wall comprises:

a flat generally circular surface.

3. A snap-over cover for containers having an external peripheral bead around the upper edge thereof, said cover being formed of an easily flexed material as set forth in claim 1 in which said top wall further includes:

a flat wall in the center of said container having an outer generally circular edge; and

an annular portion raised above the flat wall and having an inner wall connected to said generally circular edge of said central flat wall and an outer wall connected to said inner edge of said arcuate cross-sectional bead.

4. A snap-over cover for containers having an external peripheral bead around the upper edge thereof, said cover being formed of an easily flexed material as set forth in claim 2 in which each said arcuate land is formed on a circle of diameter at least equal to the outer diameter of said inverted peripheral channel.

5. A snap-over cover for containers having an external peripheral bead around the upper edge thereof, said cover being formed of an easily flexed material as set forth in claim 1 in which said top wall includes:

a flat wall in the center of said container having an outer generally circular edge;

an annular portion raised above the flat wall and having an inner wall connected to said generally circular edge of said central flat wall and an outer wall connected to said inner edge of said arcuate cross-sectional bead; and

a plurality of notches in said annular portion and spaced around said annular portion whereby each said snap-over cover stacked with another is spaced from each other snap-over cover as each notch of an upper cover bears upon an upper surface of the raised annular portion of a lower cover.

6. A snap-over cover for containers having an external peripheral bead around the upper edge thereof, said cover being formed of an easily flexed material as set forth in claim 5 in which said notches are molded into the inner wall of said raised annular portion and spaced from each other 75°, 90°, 75° and 50° respectively whereby the notches of one cover in nested relation with another cover have the least tendency to fall into each other.

7. A snap-over cover for containers having an external peripheral bead around the upper edge thereof, said cover being formed of an easily flexed material as set forth in claim 1 in which said top wall includes:

an annular raised portion having an upper wall, an inner wall and an outer wall and extending adjacent said inverted peripheral channel; and
a plurality of notches formed into the inner wall of said annular raised portion and spaced along its extent whereby the lower surface of said notch rests upon the upper wall of said annular raised portion of another cover when one snap-over cover is stacked above another snap-over cover.

8. A snap-over cover for containers having an external peripheral bead around the upper edge thereof, said cover being formed of an easily flexed material as set forth in claim 7 in which each said arcuate land further includes:

an upper surface congruent to the outer upper surface of said inverted peripheral channel and a lower lateral surface congruent to the outer lower lateral surface of said channel whereby the lower surface of said notches rests upon the upper wall of said annular raised portion at the same time that the upper surface of said land rests upon the upper surface of said inverted peripheral channel and the lateral surface of said land rests against the lateral surface of said inverted peripheral channel to prevent lateral shift of said covers relative to each other and to provide two vertical support areas to prevent sticking.

9. A snap-over cover for containers having an external peripheral bead around the upper edge thereof, said cover being formed of an easily flexed material as set forth in claim 8 in which said notches form a rectangular recess into the inner wall of said raised annular portion.

10. A snap-over cover for containers having an external peripheral bead around the upper edge thereof as set forth in claim 9 in which said notches form a recess in the inner wall of said raised annular portion having side walls with a curved cross-section and a flat bottom wall.

11. A snap-over cover for containers having an external peripheral bead around the upper edge thereof as set forth in claim 1 in which said arcuate land further comprises:

top wall includes a flat wall in the center of said container having an outer generally circular edge, a plurality of extensions along the circular edge of said flat wall, and an annular portion raised above the flat wall whereby the extensions of one cover bear on the annular portion of another cover in nested relation therewith.

12. A lid of flexible material for gripping and sealing engagement with a container having an external peripheral bead around the upper edge thereof comprising:

a central panel having a generally circular margin defining its circumference;
an inverted circumferentially extending channel radially outward of said central panel and having an upper inner circumferential edge and a lower outer circumferential edge;
an annular portion raised above the central panel and interconnected between said panel and said channel;
a depending peripheral conical skirt extending downwardly from the outer circumferential edge of said channel;

a waist formed at the lower outer edge of said inverted channel and a part of the upper portion of said skirt to underlie the peripheral bead of a container on which the lid is mounted to retain the lid thereon; and

a series of land arcuately formed along the vertical defining part of said skirt and extending from said waist toward the lower part of said skirt and shaped to guide the peripheral bead of said container into said inverted channel and to form a matingly snug fit onto the outer wall of said inverted peripheral channel when one snap-over cover is stacked above a lower snap-over cover.

13. A lid for gripping and sealing engagement with a container having an external peripheral bead around the upper edge thereof as set forth in claim 12 which further includes:

a lower circumferential rim extending about the lower edge of said skirt.

14. A lid for gripping and sealing engagement with a container having an external peripheral bead around the upper edge thereof as set forth in claim 12 in which said inverted channel: further includes.

a continuous rounded section extending from said inner circumferential edge to said outer circumferential edge and of a contour to fit snugly about said bead of the container when said bead is thrust past said waist and into said continuously rounded section.

15. A lid for gripping and sealing engagement with a container having an external peripheral bead around the upper edge thereof as set forth in claim 14 in which each said arcuate land includes:

a curved bearing surface having a shape congruent to a segment of the continuous rounded section of said inverted channel whereby said curved bearing surface rests on said continuous rounded section when one cover is stacked above another cover.

16. A lid for gripping and sealing engagement with a container having an external peripheral bead around the upper edge thereof as set forth in claim 14 wherein: said raised annular portion includes an inner wall connected to said generally circular margin of said central flat wall and an outer wall connected to said inner edge of said channel; and

a plurality of notches formed into the outer wall of said raised annular portion and being of a size to cause the bottom wall of each notch of one cover to ride on the top of said raised annular portion of another cover in stacked relation therewith whereby said covers have supporting surfaces between said notches and said top of said raised annular portion and between said arcuate lands and said continuous rounded section to avoid lateral shifting and vertical sticking between vertically stacked adjacent covers.

17. A lid for gripping and sealing engagement with a container having an external peripheral bead around the upper edge thereof as set forth in claim 12 which further includes:

a plurality of stacking notches formed into said raised annular portion and being of a size to cause each notch to ride on a raised annular portion of a lower cover when one cover is stacked on another.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,883,036

DATED : May 13, 1975

INVENTOR(S) : John W. Mahaffy and Herm L. Haven

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 2, line 7, delete "shaped";
line 39, after "3" insert --is--;
Col. 3, line 22, change "paried" to --paired--;
line 60, change "aboutu" to --about--;
Col. 4, line 62, change "wasist" to --waist--;
Col. 5, line 4, change "ourwardly" to --outwardly--;
Col. 6, line 65, change "therof" to --thereof--;
Col. 7, lines 42 and 43, delete "arcuate land further
comprises:".

Signed and Sealed this

twenty-ninth Day of July 1975

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks