

[54] **SCREW ON LID**

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[58] Field of Search **220/27, 42 R, 42 A, 60 R, 220/288, 306, 352, 355, 39 R; 229/43**

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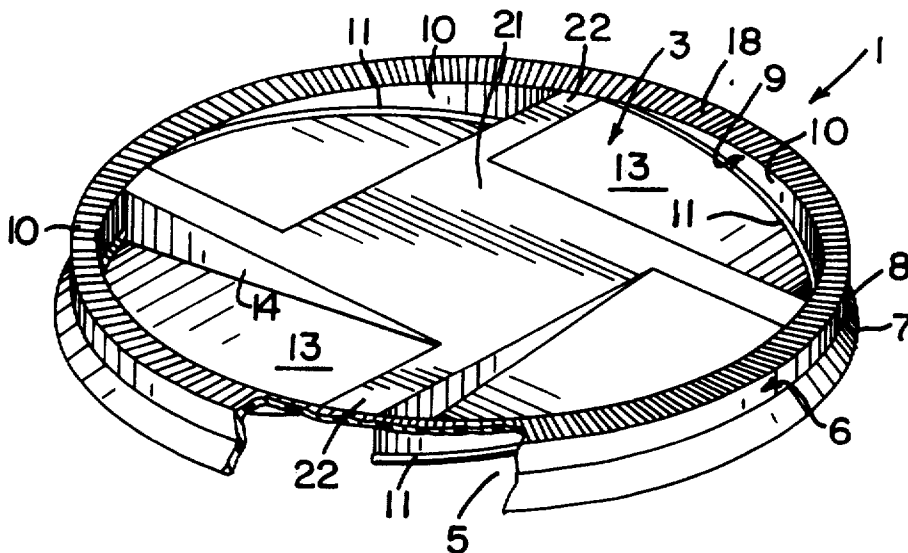
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[57]

ABSTRACT

A cup lid adapted to thread onto a container which is made of a soft cushion material such as expanded polystyrene. The lid has a downwardly open channel or groove on its outer margin. Outward threads are formed along the inner wall of the open channel to allow the cup lid to be threaded into a cup.

10 Claims, 3 Drawing Figures



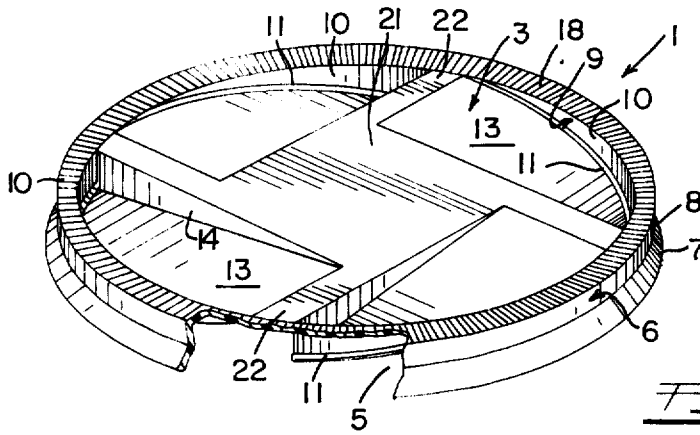


FIG. 1

FIG. 2

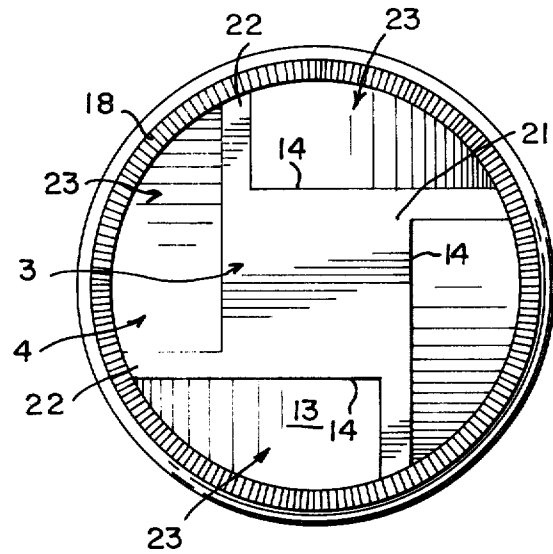
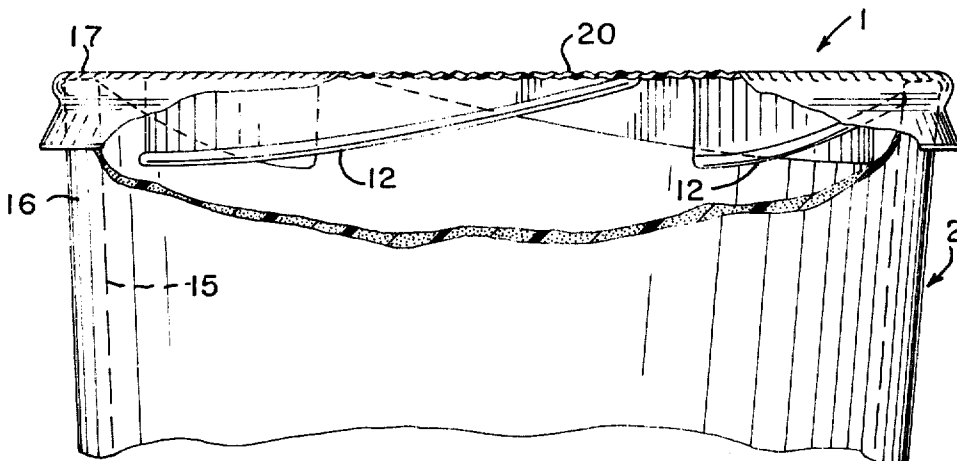


FIG. 3



SCREW ON LID

My invention relates to cup lids and particularly to a cup lid for closing a container made of a soft cushion material.

In the manufacture of cups and other containers made of soft cushion material such as expanded polystyrene or expanded polyurethane and a similar material, the cups which are supposed to be of the same size are often of slightly differing sizes because of different conditions of manufacture or because of some variants in the substance used in the cup. For one reason or another, the diameter of the cup lip and thickness varies somewhat from cup to cup. For this reason, snap-on lids frequently fail to grip the cup lip and thus fall off of the cup. In short, sizing containers to close tolerances is very difficult and is infrequently done. Thus, the lip of the mouth of the cup varies in size and may or may not form a close fit with a snap-on lid because the outside diameter of a snap-on lid is made to close tolerances.

In the past, snap-on lids have been used to seal the open mouths of cups made of soft cushion material. However, as indicated above this system has frequently been ineffective and resulted in spilled liquid with burning or staining resulting. These containers are usually filled with hot liquids and the expanded material is used for its insulating qualities as well as its strength.

It is an object of this invention to provide a lid which threads into the mouth of a cup which is made of a soft cushion material.

It is another object of this invention to provide a lid which fits a cup made of soft cushion material and allows the lid to thread onto the cup even though the dimensions of the cups, of the same manufactured size, vary some in height, thickness and diameter from cup to cup.

Other objects and advantages of the invention will become apparent from the detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of the lid with a section cut away;

FIG. 2 is a top view of the lid showing knurling and internal bracing;

FIG. 3 shows the lid turned onto a cup with a section of the lid and cup broken away showing the threads on the inner wall of the downwardly open groove.

The lid 1 shown in FIG. 1 is made of a thin plastic material to fit as a cap or lid on the top of a container 2 of expanded polystyrene, expanded polyurethane or made of other soft cushioned material. The container is not shown in FIG. 1 but the assembly of the container cap 1 on a container 2 made of expanded polystyrene or the like is shown in FIG. 3 with a cutaway section to show the thickness of the container. The lid has a central section 3 of a generally circular configuration. Extending around the periphery 4 of the central section 3 is a downwardly opening circumferentially extending cavity or channel 5. The channel 5 has as its outer wall 6 a somewhat conically shaped skirt 7. The outer wall 6 may actually be shaped as having a lower curvilinear skirt 7 with a circumferential straight side wall 8 above it or may be shaped into a truncated right circular cone or cylinder (not shown). The circumferential straight side wall 8 connects the external skirt to a top connecting ring of the channel. As shown in FIG. 1, the inner

wall 9 is formed by a series of curved triangular panels 10. Only four such triangular panels 10 are shown in FIGS. 1-3. Actually, any number of panels may be used depending on the size of the lid and the thickness of the material of the cup lid. For the ordinary typical small size cup and cup cover, four panels 10 are found to be an optimum number.

A screw thread 11 is formed into the surface of each triangular panel. The thread 11 extends at an acute angle to the plane of the top of the lid. The bearing surfaces 12 of the threads 11 are external and project into the channel. A convenient place for the thread is along the bottom of the triangular panel 10 as shown. In this way, when the lid 1 is turned onto the expanded polystyrene cup 2, the cup lid 1 is threaded into the soft cup wall 2. After being threaded, the cup lid 1 occupies a position as shown in FIG. 3. The threads 11 on the curved triangular panels 10 and the panels 10 themselves are each braced to some extent by an indent bracing panel 13 which extends inwardly from the curved triangular inner wall 10. A bracing panel 13 extends inwardly from the lower edge of each triangular panel 10 of the inner wall until it comes to the indent inner wall 14. The flat section of the bracing panel 13 which is shown in FIGS. 1 and 2 serves to hold the thread 11 on the inner wall 10 against the soft cushioned material of the container 2. The thread 11 as it is turned against the container 2 threads the container 2 and may even to a slight extent cut the soft inner wall 15 of the cushioned material as it threads down into the mouth of the container. The closure cap 1 is pulled downwardly and the container wall 16 is pressed somewhat outwardly against the skirt 7 and outer wall 8 of the downwardly opening channel 5. As the side of the container presses against the outer wall 8 of the channel 5, it is forced somewhat inwardly against the threading 11. This process makes the cap 1 more securely tightened onto the inner wall 10 of the container. The upper edge 17 of the container wall 16 finally comes up against the top connecting ring 18 which is shown with knurling 20 along its upper surface. When this happens, the operator can feel a sudden resistance to further turning. At this point, the container cap 1 has been turned on to the mouth of the cushioned cup 2, a tight lock has taken place between the cap and cup and no liquid will leak out between the cap and the cup.

The top view shown in FIG. 2 shows the knurled circumferential connecting ring 18 around the periphery of the cover 1. This view shows the central panel 21 which is part of the central section which connects to the circumferential connecting ring 18. Four wings 22 are shown extending from the central panel 21 to the circumferential connecting wall 18. These wings 22 function to hold the central panel 21 in place as well as a slight stiffening effect to the central section. The indents 23 are shown here to be four in number. They and the wings 22 may be any number depending upon the size and general configuration of the cup lid. The lid for a normal size cup such as is carried in the hand operates quite efficiently with four wings and four indents. For larger cups, more indents and wings may be used.

The knurled ring 18 helps to give lateral rigidity to the lid as well as give a surface that the operator may grip when turning the lid 1 into the cup 2.

The indent bracing panels 13 give lateral support to the inner wall 10 of the channel 5 because they are flat and each bracing panel lies inwardly of and supports each curved triangular panel 10. Further, the indents 23 including the channel walls give considerable torsional stability to the screw-in lid.

Although the discussion above stresses the use of this lid as a screw-in lid, the lid may also be used effectively as a snap-in lid by forcing the lid directly down onto a cup. The lid threads will seat into the soft cushioned material of the cup side wall and a tight fit is obtained.

The advantages of this invention are that the container cap threads into the inside of the cup which is made of soft cushioned material. The primary force applied to the container cap is compressive rather than tensile. A tight fitting container cap is made and the cap is not subject to splitting or pop-off as is the situation with detent means located on the outer wall of the downwardly opening circumferential channel. A cup need not be forced with a cup lid since there is no snap-on lid. Close tolerances need not be maintained in forming the cup of soft cushioned material since the lid fits a wide range of cups within a manufacturing size.

While the preferred embodiment has been shown and described, it is understood that the foregoing is a description of illustrative embodiment of the invention and it is applicant's intention in the append claims to cover all forms which fall within the scope of the invention.

I claim:

1. A lid for threading engagement with a container having a rim forming a mouth and made of a soft cushioned material, said lid comprising:
 - a central section of such size as to extend substantially across the mouth of the container;
 - means defining a downwardly opening circumferentially extending cavity on said lid and attached to said central section and having inner and outer walls;
 - and
 - at least one thread formed on the inner wall of said cavity and inclined to the horizontal axis of the lid whereby as the lid is rotated onto the container said thread cuts into the inner side of said rim to form a detent to hold the lid onto said container.
2. A lid for threading engagement with a container having a rim forming a mouth and made of a soft cushioned material as set forth in claim 1, said downwardly extending circumferential cavity means comprising:
 - a continuous skirt forming the outer wall of said cavity;
 - a series of triangular segments forming the inner wall of said cavity;
 - a circumferential connecting wall connecting said skirt to one side of each of said series of triangular segments; and
 - at least one thread formed on each of said series of triangular segments whereby said thread engages said soft cushioned material to hold said lid on said container.
3. A lid for threading engagement with a container having a rim forming a mouth and made of a soft cushioned material as set forth in claim 1 in which said central section comprises:
 - a central panel;
 - indents formed adjacent said central panel and each comprising:

an indent outer wall formed by a segment of the inner wall of said cavity;
an indent inner wall attached to an outer edge of said central panel; and

a plurality of wings extending from said central panel to connect with the top of said circumferentially extending cavity and having a margin of each said indent attached to a second side of said wing.

4. A lid for threading engagement with a container having a rim forming a mouth and made of a soft cushioned material as set forth in claim 3

wherein said indent outer wall is generally triangular, and

wherein each said indents further include a generally triangular panel having:

a first side connected to the lower edge of said indent outer wall;

a second side connected to the lower edge of said indent inner wall; and

a third side connected to the side of said wing which is opposite to the side wall connected to said indent inner wall.

5. A lid for threading engagement with a container having a rim forming a mouth and made of a soft cushioned material as set forth in claim 3 in which said central panel

is rectangularly shaped.

6. A lid for threading engagement with a container having a rim forming a mouth and made of a soft cushioned material as set forth in claim 2 in which said circumferential connecting wall comprises:

a flat ring.

7. A lid for threading engagement with a container having a rim forming a mouth and made of a soft cushioned material as set forth in claim 6 comprising further:

radial knurling extending around said flat ring to provide lateral stiffening to said annular ring.

8. A closure cap for threadingly holding a lid onto a container having a rim forming a mouth and made of a soft cushioned material, said lid comprising:

a central section extending substantially across the mouth;

means defining a downwardly opening circumferentially extending cavity on said lid and attached to said central section;

an outer wall forming the outer part of said cavity; wall sections connected to said central section and forming the inner wall of said cavity;

a connecting wall between the upper part of said outer wall and said inner wall sections; and

an external screw thread formed on the inner wall of each said inner wall section whereby said lid is threaded into said rim of said containers.

9. A closure cap for threadingly holding a lid onto a container having a rim forming a mouth and made of a soft cushioned material as set forth in claim 8 in which said central section comprises:

a central panel of a generally rectangular shape;

wing panels having one edge attached to said central panel and the opposing edge attached to said connecting wall;

curved triangular panels forming said wall sections and having a top side connecting to said connecting wall;

indents formed adjacent said central panel;

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a generally triangular panel forming the bottom of each said indent and having:
a curved side connected to the bottom of said curved triangular panel;
a side connected to an edge of said wing panel; and
an indent inner wall connected to an upper edge of a wing panel and a lower edge connected to a straight side of said generally triangular panel.

10. A lid for a container having a rim forming a mouth, said lid comprising:
a central section of such size as to extend substan-

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tially across the mouth of the container:
means defining a downwardly opening circumferentially extending cavity on said lid attached to said central section;

and
at least one screw thread formed on the inner part of said cavity such as to press into the rim of the container to form a detent to hold the lid onto said container.

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