

[54] NON-SPILL DRINKING CUP TOP

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[51] Int. Cl.B67d 3/00

[58] Field of Search.....222/482, 545, 559, 222/509, 518; 220/90.4, 90.2, 44 R; 137/525

[56] References Cited

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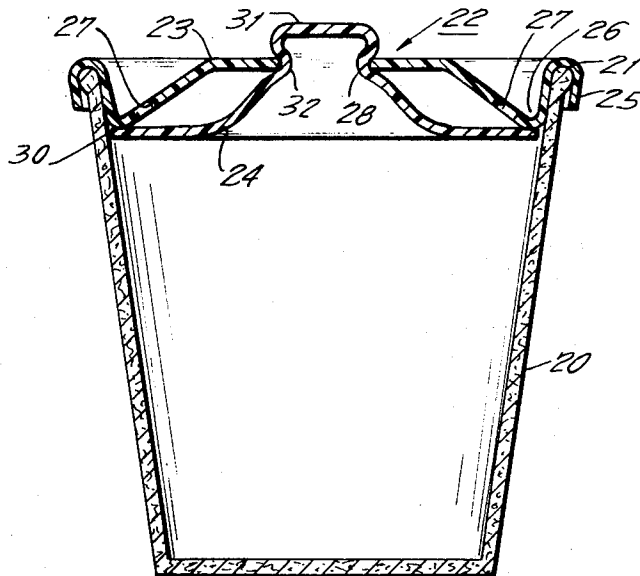
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Assistant Examiner—John P. Shannon
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[57] ABSTRACT

A non-spill drinking cup cover is formed of two sections joined together at their center. The outer cover section can be secured to the outer periphery of a drinking cup in a conventional manner and further contains a relatively deep annular well extending around its outer periphery. Openings are provided at or near the bottom of this well, which are normally sealed by the inner cover member. The openings are unsealed by the user pressing down on the outer cover member to resiliently deform or deflect the outer cover member, thereby to move the bottom member down and away from the openings. The annular well may then be filled with fluid from the cup interior by conventionally tilting the cup, and the user may drink from any angular position on the rim of the outer annular well.

14 Claims, 14 Drawing Figures



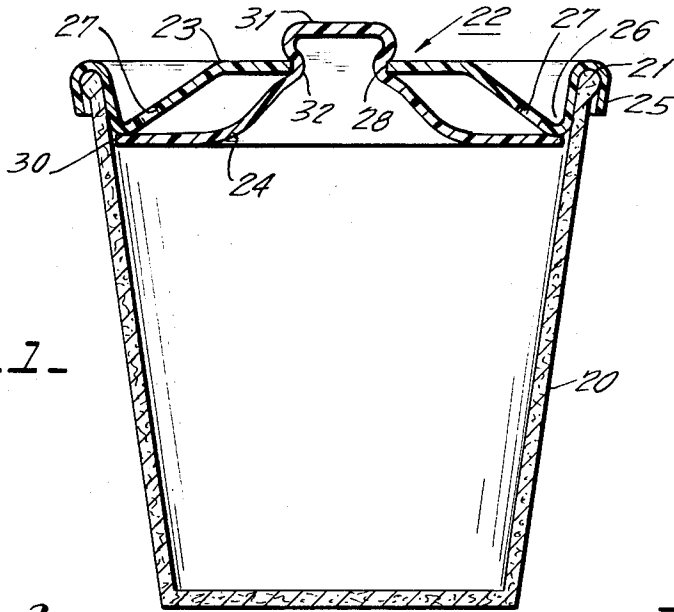


FIG. 1.

FIG. 2.

FIG. 3.

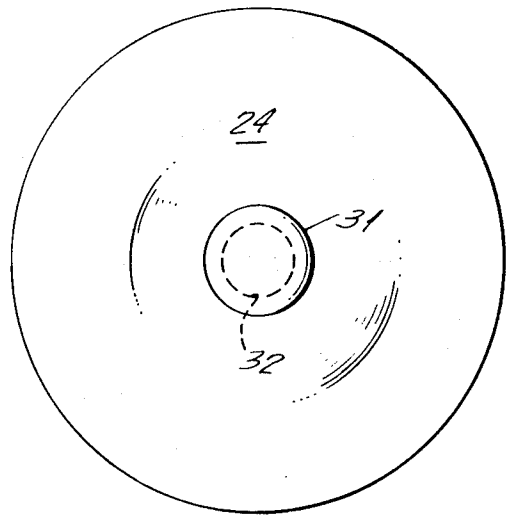
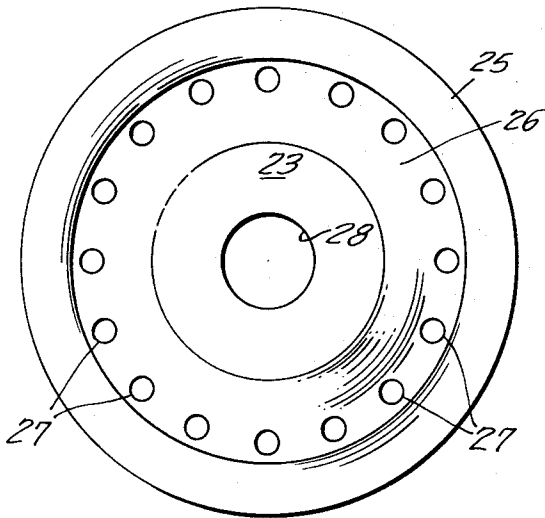


FIG. 5.

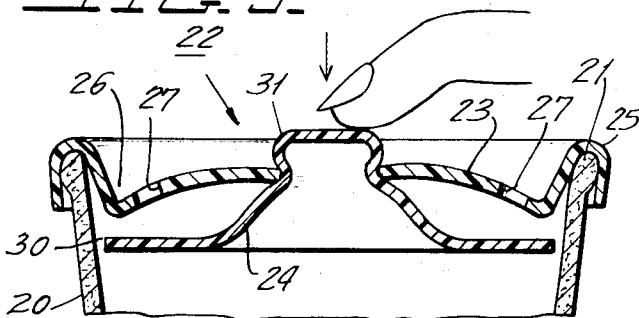
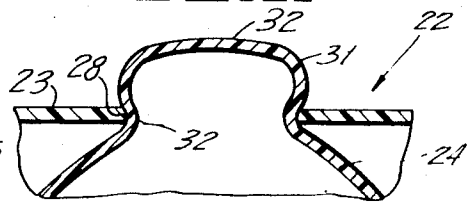


FIG. 4.



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FIG. 6.

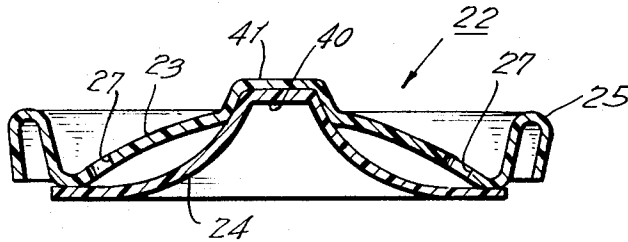


FIG. 7.

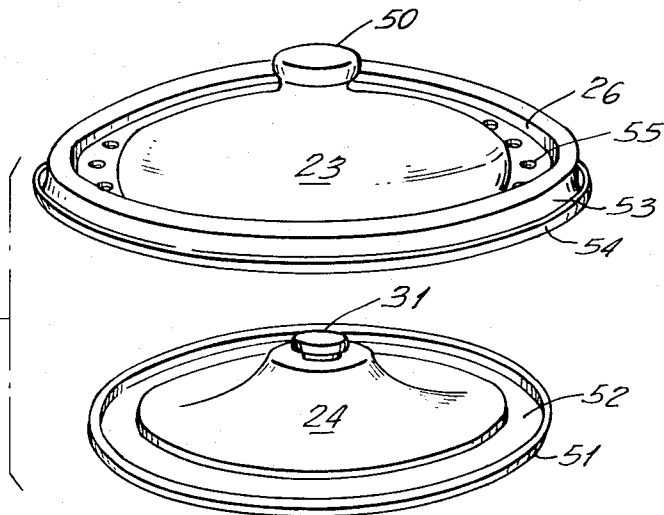


FIG. 8.

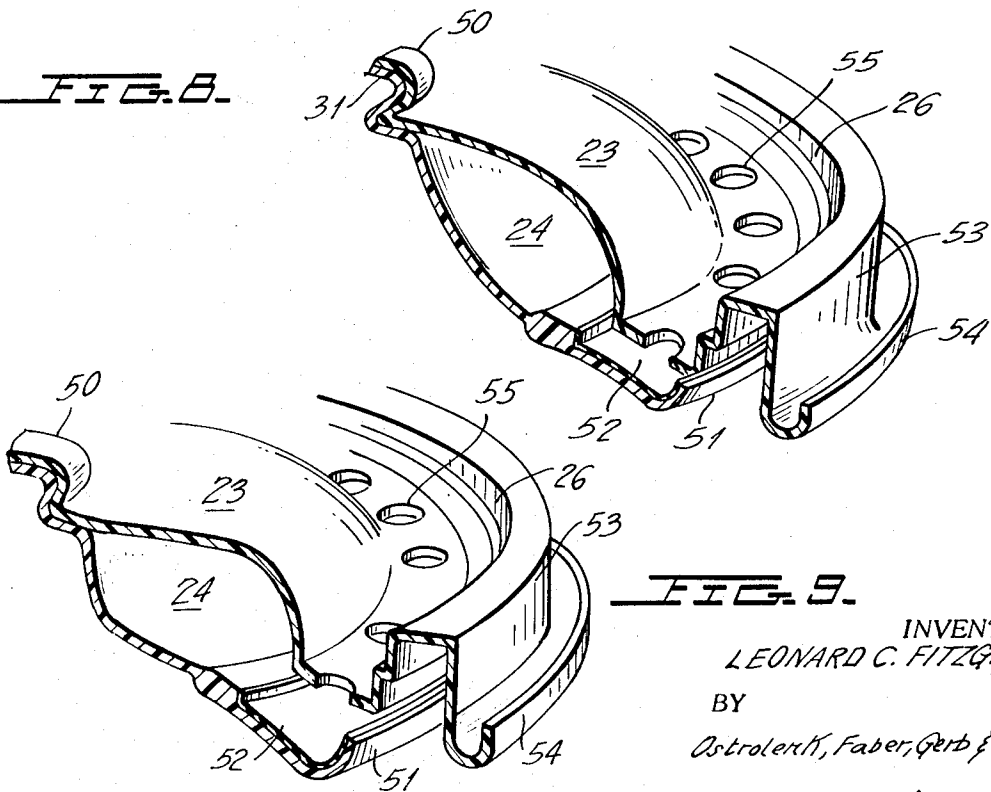


FIG. 9.

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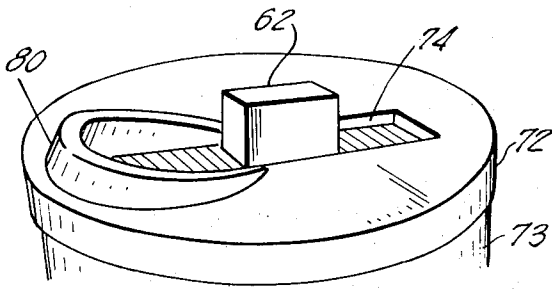


FIG. 14.

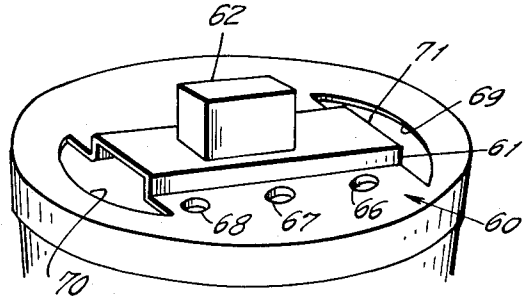


FIG. 10.

FIG. 11.

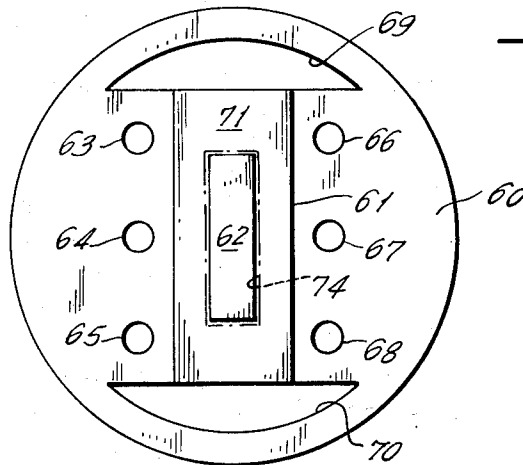


FIG. 12.

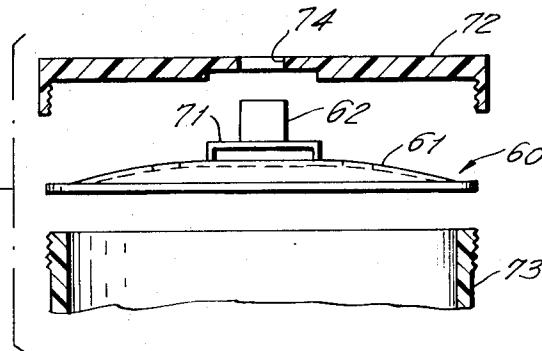
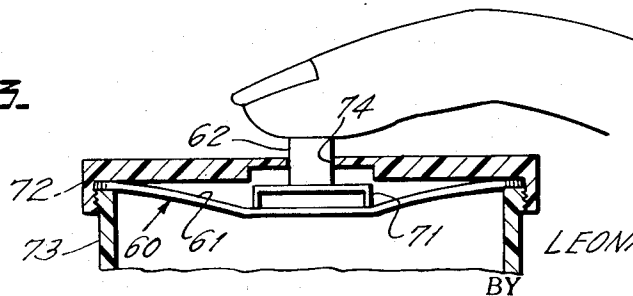


FIG. 13.



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RELATED APPLICATIONS

This application discloses an improvement of the structure shown in my copending application Ser. No. 631, filed Jan. 5, 1970, entitled CONTAINER CLOSURE, now U.S. Pat. No. 3,635,380.

BRIEF SUMMARY OF THE INVENTION

This invention relates to drinking cup closures, and more particularly relates to a non-spill drinking cup closure having a sealable opening which permits the user conveniently to drink from a container while the cover is in position.

Non-spill drinking cup covers which are commercially acceptable from points of view of economy and convenience of use have been sought for many years. Covers of this type have numerous applications, such as for covering a fluid-filled container which is to be used while the user is in motion which could cause spillage of the container contents when the cover is open. Typical of myriad applications is the use of the cover for a hot coffee container to be used in a moving vehicle such as an automobile, boat or commuter train.

Non-spill container covers proposed in the past generally required relatively complex parts and valve structures which raise the expense of the cover prohibitively, particularly where the cover is to be disposable. The prior art container covers also have restricted peripheral areas for drinking from the cup, with the cover in place, and the user is aware that he is not drinking from the familiar cup rim, thereby leading to a psychological dislike to using this kind of valved cover.

The present invention provides a novel non-spill cover for a container which is formed of only two cover members which may be snapped together when they are to be used. Each of the cover members is generally circularly shaped to permit their manufacture by conventional plastic sheet-forming equipment using simple and inexpensive dies. Moreover, the two cover parts can be shipped in separate and nested packages, to be assembled at the point of use.

The outer cover member is provided with a deep annular well leading to the lip of the outer cover, which lip can fit over the rim of a conventional container. When the container is to be used, the annular well may be filled with fluid from the container and the user may drink from any peripheral region of the cover lip, having the same mouth sensation as when drinking from the rim of a conventional container.

The bottom of the annular well has openings therethrough which are normally covered, at the interior surface of the outer cover, by the interior cover member. The interior cover member is secured to the outer cover member, as by a snap-type joint, or in any desired manner, and is pressed against the interior of the outer cover member by the resilient force of the outer and inner cover members, which are slightly flexed when connected together.

The opening in the cover member is exposed, the permit fluid to flow from the container interior to the annular well, by the user pressing down on a central region of the outer cover, thereby to deform the outer cover and press the interior cover away from its sealing relation relative to the interior surface of the outer cover member.

A further feature of the invention is that it can be made sufficiently inexpensive to be disposable. However, if desired, the two cover member sections may be readily snapped apart for cleaning and reuse.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cross-sectional view through the axis of a disposable container having thereon the non-spill cover of the invention.

FIG. 2 is a top plan view of the inner cover member of FIG. 1.

FIG. 3 is a top plan view of the outer cover member of FIG. 1.

FIG. 4 is an enlarged cross-sectional view of the snap-connection between the outer and inner cover members in FIG. 1.

FIG. 5 shows the cover member of FIG. 1 with the user depressing the center of the cover to allow fluid to flow into the annular well formed within the outer lip of the outer cover.

FIG. 6 shows a modified connection between the outer and inner cover members.

FIG. 7 is an exploded view of an inner and outer cover member shaped in accordance with a further embodiment of the invention.

FIG. 8 is a cut-away perspective view of the cover of FIG. 7 with the outer and inner members sealed to one another.

FIG. 9 is similar to FIG. 8 but shows the cover members operated to their valve-open positions due to deflection of the covers by the user.

FIG. 10 is a perspective view of a deformable cover member element constructed in accordance with a further embodiment of the invention.

FIG. 11 is a top plan view of FIG. 10.

FIG. 12 is an exploded cross-sectional view of a cover and cup using the flexible member of FIGS. 10 and 11.

FIG. 13 shows the arrangement of FIG. 12 when assembled, and when in use.

FIG. 14 is a perspective view of one form of drinking spout which could be used in connection with the arrangement of FIG. 13.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring first to FIGS. 1 and 5, there is shown a conventional disposable drinking container 20, made, for example, of a foamed plastic, and having a normally open lip 21. Clearly, container 20 may take any desired form and can be made of any desired material. The cover 22 (FIGS. 1, 4 and 5) of the present invention is intended to fasten onto the periphery of lip 21 after the container is filled with a liquid.

Cover 22 is formed of an outer member 23 (FIGS. 1, 2, 4 and 5) and an inner member 24 (FIGS. 1, 3, 4 and 5) which are each circular in configuration, generally flat and which are preferably formed of resiliently rigid, thermoformed plastic material of the type familiarly used for disposable container lids. Thus, the members 23 and 24 are self-supporting and relatively rigid, but are sufficiently elastic to be deformed to fit and hold to one another and to the container 20, as will be later described.

Outer member 23 contains a reentrantly-shaped rim section 25 which may be of the type used on conventional lids for fitting container rim 21, with a snap-fit, to hold the cover member 23 on the container 20. Any other means of securing cover member 23 to container 20, for example, a threaded connection, could be used in place of the press-fit rim 21. Immediately inside the rim 25 of cover member 23 is a relatively deep annular well 26 which has a plurality of openings 27 at or near the base of well 26. Note that the lowermost portion of well 26 on the bottom surface of cover member 23 is on a diameter greater than the diameter of holes 27. It should be further noted that the holes 27 could be replaced by a smaller number of circular slots extending around at least one diameter centered on the center of member 23. The center of member 23 is then provided with an opening 28, best seen in FIGS. 2 and 4.

It will be understood by those skilled in the art that the member 23 can be manufactured by standard equipment of the type presently used to manufacture drinking container lids. Thus, member 23 may be formed by standard thermoforming techniques, as applied to conventional plastics used for container lids, such as rubber modified polystyrene, and the like. Moreover, since the member 23 is circularly developed, the dies needed for its production are easily made. Note that openings 27 and 28 may be made by any suitable die-cutting apparatus.

The inner cover member 24 may be made similarly to conventional lids, on thermoforming equipment. Member 24 is a continuous member having an outside diameter less than the inside diameter of cup 20 at the axial position at which the member 24 is positioned relative to container 20 so that, as shown in FIGS. 1 and 5, there is always a space 30 between the outer edge of member 24 and the interior of container 20. The outer diameter of member 24 is further dimensioned to be equal to or greater than the diameter of the lowermost portion of well 26 of cover member 23. Cover member 24 is further provided with a slightly bulbous central extension 31 which has a narrow neck 32 (FIG. 4) whose outer diameter is about equal to the diameter of opening 28 in outer member 23. It should be noted that the bulbous extension 31 is such that it will not lock-up in the vacuum forming mold, but that the parts are sufficiently flexible that they can be removed from the mold without damage. A vapor pressure relieving slit 32 (FIGS. 3 and 4) may be made in extension 31.

It will be noted that member 24 is easily formed by conventional techniques, and that, in view of its circular configuration, the die structures needed for its fabrication are simple and inexpensive. Moreover, the individual cover members 23 and 24 are capable of compact storage and packaging since they can be in respective nested packages, and assembled for use where fluid-filled containers are dispensed.

The cover members may be connected together, as shown in FIGS. 1, 4 and 5, by forcing the bulbous extension 31 of member 24 through opening 28 of member 23. Because of the resiliency of these members, the extension 31 will snap into opening 28 and will be held adjacent to small diameter region 32 as shown in FIG. 4. The axial height of member 24, from the plane of diameter 32 to the bottom-most plane is

then made smaller than the height of member 23, from the plane of opening 28 to the plane of the bottom of well 26. Therefore, members 23 and 24 will be slightly elastically deformed, thus causing the outer diameter of member 24 to press against the bottom of well 26. This then forms a seal between the liquid in the container 20 and the openings 27 which lead to well 26. Thus, accidental spillage of liquid within container 20 is normally prevented. Note that the valve action of member 24 against the bottom of well 26 of member 23 can be improved if desired by coating one of the surfaces which enters into engagement with a relatively soft plastic or the like.

In order to drink from the cup, the user deforms the outer cover 23, for example, by pressing on extension 31 with his finger, as shown in FIG. 5. This then resiliently deforms member 23 so that member 24 is moved away from the bottom of annular channel 26. Fluid can now flow from container 20, through annular space 30, and openings 27 into the annular channel 26. The user then drinks with his lips at any peripheral portion of rim 25, with fluid coming into channel 26 so long as cover member 23 is depressed. When the user relaxes the cover member 23, the members 23 and 24 return to the sealed position shown in FIG. 1.

Note that when the user drinks, he is unaware, through mouth sensation, that he is drinking from an unconventional container rim, but that there is a drinking action following the general habit patterns of persons accustomed to drinking from a conventional cup.

One modification of the arrangement of FIGS. 1 to 5 is shown in FIG. 6. Thus, in FIG. 6, the cover members 23 and 24 are similar in construction to those of FIGS. 1 to 5 except that they are not connected together by a snap-type connection, but are bonded or welded by a suitable adhesive which connects the exterior dome 40 of member 24 (which replaced extension 31 of FIG. 3) to the interior of dome 41 of member 23 (which replaced opening 28 of FIG. 2).

FIGS. 7 to 9 show further possible modifications for the structure of cover members 23 and 24. Thus, member 23 is modified to contain a hollow bulbous dome 50 (FIG. 7) which receives extension 31 in snap-type relation. Moreover, the outer periphery of member 24 is upwardly turned at outer edge 51 to insure at least $\frac{1}{8}$ inch clearance to the interior diameter of the container wall, and to prevent accidental engagement with the container wall. The upper and outer peripheral surface of member 24 is formed to be generally a flat surface and it receives a soft plastic coating 52 to define a good valve seat for sealing to the bottom of annular chamber 26 in member 23.

The outer member 23 of FIGS. 7, 8 and 9 has a modified shape for its outer rim 53, and has an outwardly curled section 54 of the usual type. Moreover, the bottom of annular channel 26 is flattened to have a bottom 55, disposed in a plane, and receiving openings 27. Note that the radial length of bottom 55 is shorter than that of coating 52 of member 24. Moreover, seal 52 is in a plane parallel to the plane of bottom 55 so that, in the sealed position of FIG. 8, the openings 27 are well sealed by seal 52. This seal is defeated when member 23 is depressed, as in FIG. 9, to enable the user to drink from the container receiving the closure 23-24.

A still further embodiment of this invention is shown in FIGS. 10 to 13. Thus, a circular, thermoformed insert 60 is provided which contains a flexible web 61 leading to a plunger 62. Openings 63 to 70 are die-cut through member 60. A soft plastic coating 71 is sprayed, as shown, to form a valve surface. A cover member 72 (FIGS. 12 to 14), which may be connected to container 73 by a threaded connection or the like, is then provided with a rectangular slot 74 therein, which is smaller in dimensions than coating 71. Thus, coating 71 can seal against the interior surface of cover 72 at areas adjacent slot 74.

Member 60 of FIGS. 10 to 13 is held in position by being captured between the rim of container 73 and the interior surface of cover 72. Normally, surface 71 presses against the interior of cover 72 to prevent spillage of fluid from the cup. In order to allow fluid to flow from container 73, plunger 62 is depressed as in FIG. 13 to allow fluid flow through openings 63 to 70, and through the space between seal 71 and the bottom of cover 72 to the interior of the container.

FIG. 14 shows that the cover 72 can have a shaped mouthpiece 80 for drinking from the container. Note, however, that an annular channel could be formed in cover 72, such as channel 26 of FIGS. 1 to 9, to permit the use of familiar drinking mechanics by the user of the container.

Although there has been described a preferred embodiment of this novel invention, many variations and modifications will now be apparent to those skilled in the art. Therefore, this invention is to be limited, not by the specific disclosure herein, but only by the appended claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows:

1. A container closure comprising, in combination:
 - a first cover means having peripheral connection means thereon connectable to the lip of an open container, and at least one opening extending through said first cover means;
 - a second cover means; said second cover means being disposed adjacent said first cover means;
 - connection means connecting said first and second cover means to one another; one of said cover means being elastically deformable normally to press area portions of said second cover means across said at least one opening, thereby normally sealing said at least one opening;
 - said second cover means having a raised central por-

tion extending from the top of said container closure which is adapted to be pressed by a user to shift causing elastic deformation of the deformable said cover means, thereby to open said at least one opening.

2. The container closure of claim 1 wherein said first cover means is disposed on top of said second cover means relative to the top and bottom of a container which receives said container closure.

3. The container closure of claim 1 wherein said first cover means is a circular generally flat disk.

4. The container closure of claim 1 wherein said first and second cover means are each concentric circular generally flat disks.

5. The container closure of claim 1 wherein said at least one opening includes a plurality of openings disposed on a common diameter.

6. The container closure of claim 1, wherein said first cover means has an annular well therein; said at least one opening extending through a portion of said annular well; the outer diameter portion of said annular well communicating with the periphery of said first cover means, whereby a user can drink from any peripheral portion of said container closure when said at least one opening is open to allow fluid to flow from the interior of a container and into said annular well.

7. The container closure of claim 6 wherein said first and second cover means are each concentric circular generally flat disks.

8. The container closure of claim 6 wherein said at least one opening includes a plurality of openings disposed on a common diameter.

9. The container closure of claim 7 wherein the bottom of said annular well is flattened; said plurality of said openings passing through said flattened bottom.

10. The container closure of claim 8 wherein said connection means consists of a snap-type connection disposed at the center of said first and second cover means.

11. The container closure of claim 8 wherein said first and second cover means are each concentric circular disks; the diameter of said second cover means being about equal to the diameter of the bottom of said annular well.

12. The container closure of claim 2, wherein it is said first cover means that is elastically deformable.

13. The container closure of claim 6, wherein it is said first cover means that is elastically deformable

14. The container closure of claim 10, wherein it is said first cover means that is elastically deformable.

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