March 2, 1965 P. DAVIS ETAL 3,171,580

LID

Filed March 19, 1963

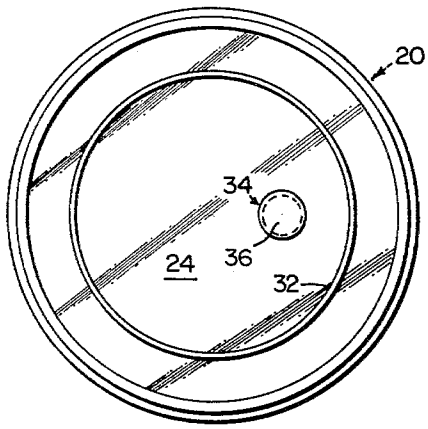


FIG.1

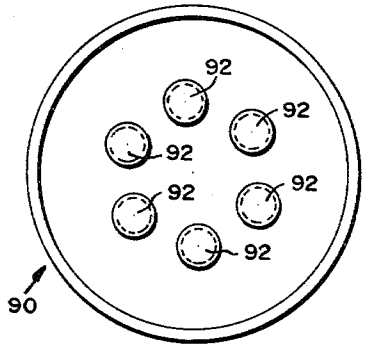


FIG.14

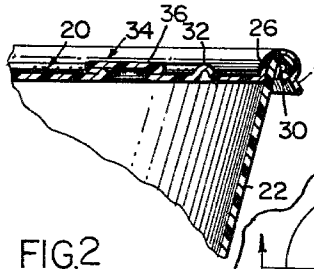


FIG.2

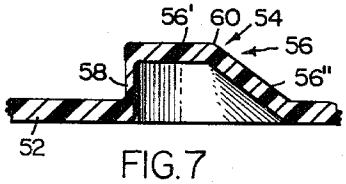


FIG.7

FIG.6

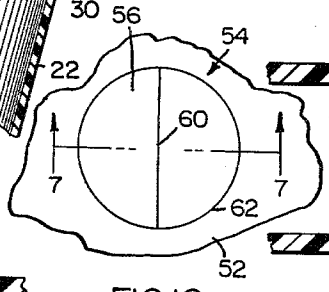


FIG.10

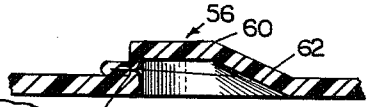


FIG.8

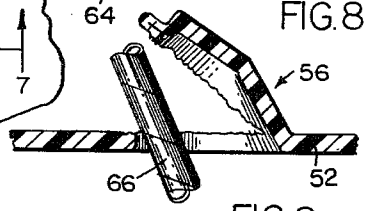


FIG.9

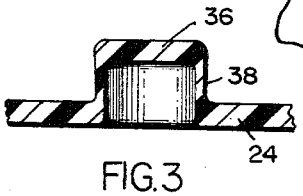
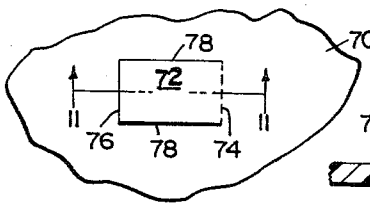


FIG.3



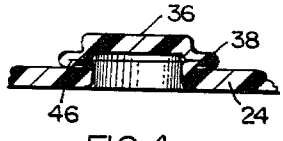


FIG.4

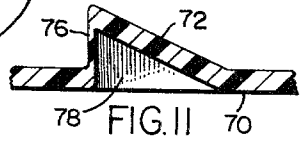


FIG.11

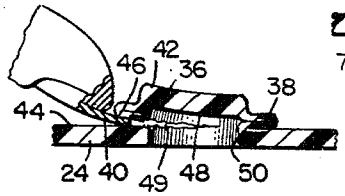


FIG.5



FIG.13

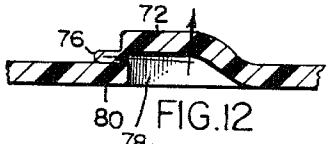


FIG.12

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LID

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10 Claims. (Cl. 229—7)

This invention relates to lids for containers and more particularly comprises a new and improved disposable plastic lid having means provided therein for the formation of one or more openings such as may receive a straw.

Many different arrangements have been devised for providing openings in drinking cup lids to enable the contents of the cups to be drained with a straw without removing the lids. Such means are desirable as they reduce the likelihood of the contents spilling, particularly in automobiles and other places where soft drinks are often consumed and where tables are not available.

While openings for receiving straws are desirable for the purpose described, such openings unless provided with their own closures markedly impair the usefulness of the lids in the performance of their primary function. Therefore, substantially all straw openings now available are provided with some form of closure. However all such closures known to us are at least partially severed from the lid proper so that while the openings do not constitute a large hole through which the contents can spill, they nevertheless do allow some leakage. The straw opening closures are also often difficult to sever from the lid proper and have a tendency to fall into the cups when any pressure is applied to them. This is unsanitary, and when a closure drops into the cup it makes the drink somewhat less appealing.

One important object of this invention is to provide a disposable lid for drinking cups having a wholly imperforate surface but which is provided with means which enables the user to quickly form a straw opening therein without the use of special tools of any kind.

Another important object of this invention is to provide a straw opening closure for cup lids, which will not readily pass through the straw opening and fall into the container covered by the lid.

Yet another important object of this invention is to provide an area in a container lid which may readily be removed from the lid with thumbnail pressure so as to form an opening in the lid for the insertion of a straw.

Still another important object of this invention is to provide a very inexpensive and convenient method for forming a straw opening in a lid.

Another important object of this invention is to provide a container cover having a wholly imperforate surface but which is provided with a plurality of partially formed shaker openings which may be completed with thumbnail pressure to allow the container contents to be discharged.

To accomplish these and other objects of this invention the lid comprises a main closure disc for covering a container, which disc has provided therein one or more wells that extend from the plane of the disc to one side thereof. Each well has a side wall which is appreciably weaker structurally than the end wall of the well and the disc of the lid, and a groove is provided in the side wall into which a fingernail or other relatively sharp instrument may be inserted to sever the wall and thereby form the opening.

To provide the lid with this capability the well is first formed in the closure disc of the lid and then the side wall of the well is permanently deformed to structurally weaken it. When so weakened pressure applied to the side wall of the well will readily tear it and thus provide an opening in the disc.

These and other objects and features of this invention will be better understood and appreciated from the following detailed description of several 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 fragmentary cross sectional view of the lid shown in FIG. 1, positioned on the rim of a cup;

FIGS. 3 and 4 are fragmentary cross sectional views suggesting the manner in which the straw opening of FIG. 2 is formed;

FIG. 5 is a fragmentary cross sectional view showing the manner in which the straw opening cover may be torn;

FIG. 6 is a fragmentary plan view of a lid having a partially formed straw opening in accordance with this invention;

FIG. 7 is a cross sectional view taken along the corresponding section line in FIG. 6;

FIG. 8 is a cross sectional view showing the straw opening of FIGS. 6 and 7 fully formed;

FIG. 9 is a cross sectional view of the lid shown in FIG. 8 severed around a portion thereof to enable a straw to be inserted through it;

FIG. 10 is a fragmentary plan view of a lid having another embodiment of a straw opening partially formed therein in accordance with this invention;

FIG. 11 is a cross sectional view taken along the corresponding section line in FIG. 10;

FIG. 12 is a cross sectional view showing the lid of FIGS. 10 and 11 with the straw opening fully formed;

FIG. 13 is a fragmentary cross sectional view of yet another embodiment of this invention;

FIG. 14 is a plan view of still another lid or cover constructed in accordance with this invention.

In FIGS. 1 and 2 a lid 20 is shown which serves as a closure on a drinking cup 22. The lid includes a main disc or horizontal wall 24, a side wall 26 and a downturned skirt 28, the side wall 26 and the downturned skirt 28 being designed to engage and form a seal about the rim 30 of the cup 22. The lid shown also includes an annular rib 32 extending upwardly from the disc 24, which may cooperate with the bottom of a cup stacked upon it to prevent the cups from shifting laterally when a number of closed cups are stacked one upon the other. The particular configuration of the disc 24, side wall 26, skirt 28 and rib 32 form no part of the invention but rather are described merely to provide a setting for the straw opening 34 formed in the disc 24, which is the subject matter of the present invention.

The straw opening 34 is formed as a well in the disc 24 of the lid and includes an end wall 36 and side wall 38. In the embodiment shown in FIGS. 1–5 the opening is circular and therefore the end wall 34 is round and the side wall 38 is cylindrical. FIGS. 3 and 4 illustrate the manner in which the opening 34 is formed. When the lid 20 is formed the well composed of the side wall 38 and end wall 36 may simultaneously be formed in the disc 24. The lid 20 made of a plastic material may readily be drawn or vacuum formed or pressure formed with the side wall 26, skirt 28, rib 32 and well composed of the end wall 36 and side wall 38. When the well is formed the end wall 36 will normally be thicker than the side wall 38 as the plastic sheet is stretched at that region during drawing to form the well. In FIG. 3 the side wall is shown to be thinner than both the end wall 36 and the wall or disc 24 of the lid.

After the well is drawn in the disc 24 pressure is applied to the end wall 36 which causes the side wall 38 to collapse against the disc 24. The end wall 36 remains virtually unaltered but the collapsed side wall places the

end wall **36** immediately adjacent the plane of the wall or disc **24**. Because the side wall **38** is substantially thinner than the end wall it will readily buckle as shown in FIG. 4 without deforming either the wall **24** or the end wall **36** of the well. When the well is collapsed as shown in FIG. 4 the wall **38** is permanently deformed and the plastic material may craze during deformation so that it is appreciably weakened structurally. Whether the wall crazes or not, it is nevertheless considerably weaker than either the end wall **36** or the disc **24**.

In FIG. 5 the manner in which the end wall **36** may be severed from the disc **24** is suggested. Note in FIG. 5 that a fingernail **40** is shown inserted under the pleat **46** of the well and above the upper surface **44** of the wall **24**. The permanently collapsed side wall **38** is pleated with a fold **46** in which the fingernail **40** may be inserted. By inserting the fingernail in the pleat or fold **46** and applying an upwardly directed force in the direction of the inner surface **48** of the end wall, the side wall **38** will tear as shown at **49**. If the user tears the end wall **38** about the full circumference of the well, the opening **50** is entirely exposed. It is possible for the user to tear only a portion of the wall **38** so that the end wall **36** remains effectively hinged to the disc **24** permitting it to be moved back into place to form a closure for the opening **50**.

As shown in FIG. 5, if the side wall **38** tears at its base the opening **50** so formed is smaller than the diameter of the severed portion, and therefore the severed portion cannot fall through the opening into the cup.

In FIGS. 6–9 another embodiment of the invention is shown. In that embodiment the disc **52** of the lid is drawn with a well **54** defined by an end wall **56** and a side wall **58**. The end wall **56** is bent substantially across its diameter as suggested at **60** with the portion **56'** lying parallel to the disc **52** and the portion **56''** sloping from the fold **60** and merging smoothly with the plane of the disc **52**. Thus, the side wall **58** is of uniform height about approximately 180° of the well, and the wall about the remaining 180° of the well diminishes from the fold **60** effectively to nothing at region **62**. Drawn in this manner, the side wall **58** of the well is thinner about that portion of uniform height than in the portion where the height of the wall diminishes.

After the well is formed a load is applied to the end wall **56** causing the wall **58** to collapse and permanently deform. When so loaded a pleat **64** is formed in the collapsed side wall **58**, of uniform depth about the 180° of the well in which the side wall **58** was of uniform height, and the depth of the pleat **56** diminishes to the right as viewed in FIG. 8 until it is virtually nonexistent at the region **62**. Therefore, when the fingernail or some other sharp implement is inserted in the pleat **64** and a tearing force is applied upwardly on the wall **56**, the side wall **58** will readily tear through at least 180° and then the resistance to tearing will increase somewhat to the region **62** where the tearing resistance is maximum. Therefore, unless the user particularly desires to completely sever the end wall **56** from the lid, the side wall **58** will tear but leave a hinge-type of connection at the region **62**. As suggested in FIG. 9, the wall **56** remains hinged to the disc **52** and to insert the straw **66** through the opening the cover **56** is folded back about the hinge. Thus this configuration performs better for preventing the open piece from falling into the cup. When the straw is removed the end wall **56** may be repositioned as shown in FIG. 8 to close the opening.

In FIGS. 10–12 yet another embodiment of the invention is shown. In this embodiment the disc **70** of the lid is provided with a well which is generally rectangular in plan view and has an inclined end wall **72** which merges smoothly into the disc **70** at the line **74**. Thus, the well is defined by an inclined end wall **72**, one side wall **76** of uniform height, and two opposite side walls **78** which are triangular in shape and extend from the line **74** to the side wall **76**. The well formed as shown in FIGS. 10 and 11 is subjected to a load which collapses the side walls **76** and **78** as suggested in FIG. 12. When so collapsed, the side wall **76** forms a relatively deep fold or pleat **80**, and the side walls **78** are each provided with a fold or pleat which gradually diminishes in depth from the wall **76** to the line **74**. The thickness of wall **76** is appreciably less than the thickness of walls **70** and **72**, and walls **78** gradually increase in thickness from the edge adjacent wall **76** to the line **74**. To open the straw opening the fingernail may be inserted in the pleat **80** and the side walls **76** and **78** may be torn toward the line **74**. As no appreciably weakened section is formed along line **74**, the lid will not readily tear along that line and therefore a hinged cover portion **82** is provided which is similar to the hinged cover portion **56** of the embodiment of FIGS. 6–9.

In FIG. 13 an opening is provided virtually identical to that shown in FIG. 12 but rather than lying on the upper surface of the disc **70'**, the cover **72'** lies on the bottom surface so that when the side walls **76'** and **78'** are torn the end wall or cover **72'** folds downwardly into the container. However, because it remains hinged to the wall **70'** of the lid it will not drop into the container contents.

In the embodiment of FIG. 14 the principles employed in the straw openings are used in a shaker cover of the type found on cans of powdered soaps and detergents. The cover **90** in FIG. 14 is provided with a plurality (six shown) of wells **92** identical to those in the embodiment of FIGS. 1–5. The user may form one or more openings in the cover by stripping the wells as suggested in FIG. 5, the number formed of course determining how fast the can contents may be discharged. As in the previous embodiments the wells may be wholly or partially severable depending upon the shape of wells formed in the cover.

From the foregoing description it will be recognized that the straw opening may take any one of a number of shapes; for example, it may be round, oval, square, rectangular, etc. Moreover, the side wall of the well may either be weakened entirely about the well or may be weakened only about a portion thereof so that when the wall is torn the end wall will remain hinged to the remaining portion of the lid. Furthermore, the pleats may fold in rather than out as shown in the several embodiments. Of primary importance of course is that the side walls of the well be weakened so that they can readily be torn. Because numerous modifications may be made of this invention it is not intended that its breadth be limited to only those embodiments illustrated and described. Rather, it is intended that the breadth of this invention be determined by the appended claims and their equivalents.

What is claimed is:

1. A lid comprising
   a main closure disc for covering the container opening with which the lid is to be used,
   a well extending from the plane of the disc to one side thereof and having a side wall which is appreciably weaker structurally than the disc and the end wall of the well,
   and an outwardly concave pleat formed in the side wall of the well for receiving a fingernail to facilitate tearing the side wall of the well.

2. A lid as defined in claim 1 further characterized by said side wall being shorter in one portion of the perimeter of the well than in the remaining portion of the perimeter.

3. A lid as defined in claim 1 further characterized by said side wall extending about only a portion of the perimeter of the well.

4. A lid as defined in claim 1 further characterized by said well being rectangular in plan view and
   said side wall extending about three of the four sides of the well.

5. A lid as defined in claim 1 further characterized by

said side wall being thinner than the end wall of the well.

6. A cover comprising,

a main closure disc,

and a plurality of wells extending to one side thereof, each of the wells having side and end walls with the side walls being structurally weaker than the closure disc and the end wall and tearable thumbnail pressure.

7. A cover comprising

a main closure wall,

and at least one well extending to one side thereof, said well having side and end walls with the side wall being structurally weaker than the main closure wall and the end wall and tearable with thumbnail pressure.

8. A cover as defined in claim 7 further characterized by

said side wall bowing outwardly between the end wall and the main closure wall so as to overlap a portion of the main closure wall adjacent the well.

9. A cover comprising

a main closure wall,

and at least one well extending to one side thereof, said well having side and end walls with at least a portion of said side wall being structurally weaker than the closure wall and the end wall and tearable with thumbnail pressure.

10. A cover comprising

a main closure wall,

and at least one well extending to one side thereof, said well having side and end walls with a portion of said side wall being structurally weaker than the closure wall and the end wall and tearable with thumbnail pressure and with the remaining portion of the side wall forming a hinge for the end wall when the weaker portion of the side wall is torn.

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