

[54] **EASY OPENING CONTAINER**

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**FOREIGN PATENTS OR APPLICATIONS**

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**Related U.S. Application Data**

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[63] Continuation-in-part of Ser. No. 834,777, June 19, 1969, abandoned.

[52] U.S. Cl.....220/27, 220/48

[57] **ABSTRACT**

[51] Int. Cl.....**B65d 17/00**

A rotatable lid fitted over the top of a cylindrical container has a downwardly projecting tongue on its underside adapted to force severance of a dispensing opening in the container top as the lid is rotated relative to the container. A matching opening in the lid registers with the opening severed in the top to provide means for dispensing the contents of the container.

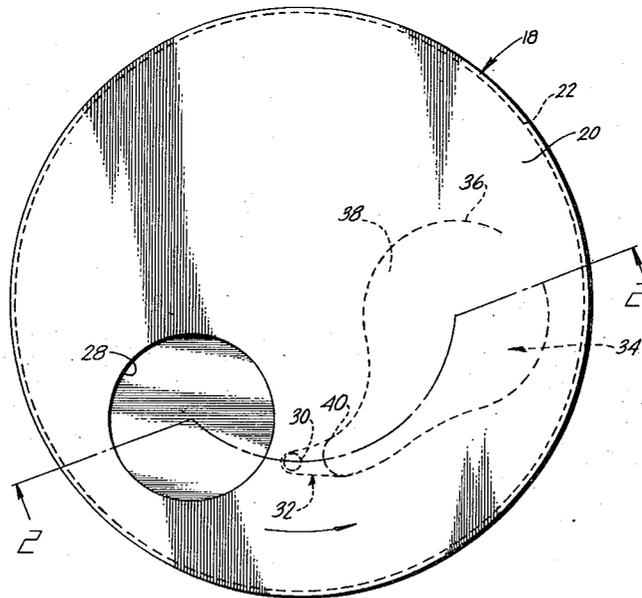
[58] Field of Search.....220/27, 48, 51;  
 222/83, 480, 541; 215/42

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**25 Claims, 5 Drawing Figures**



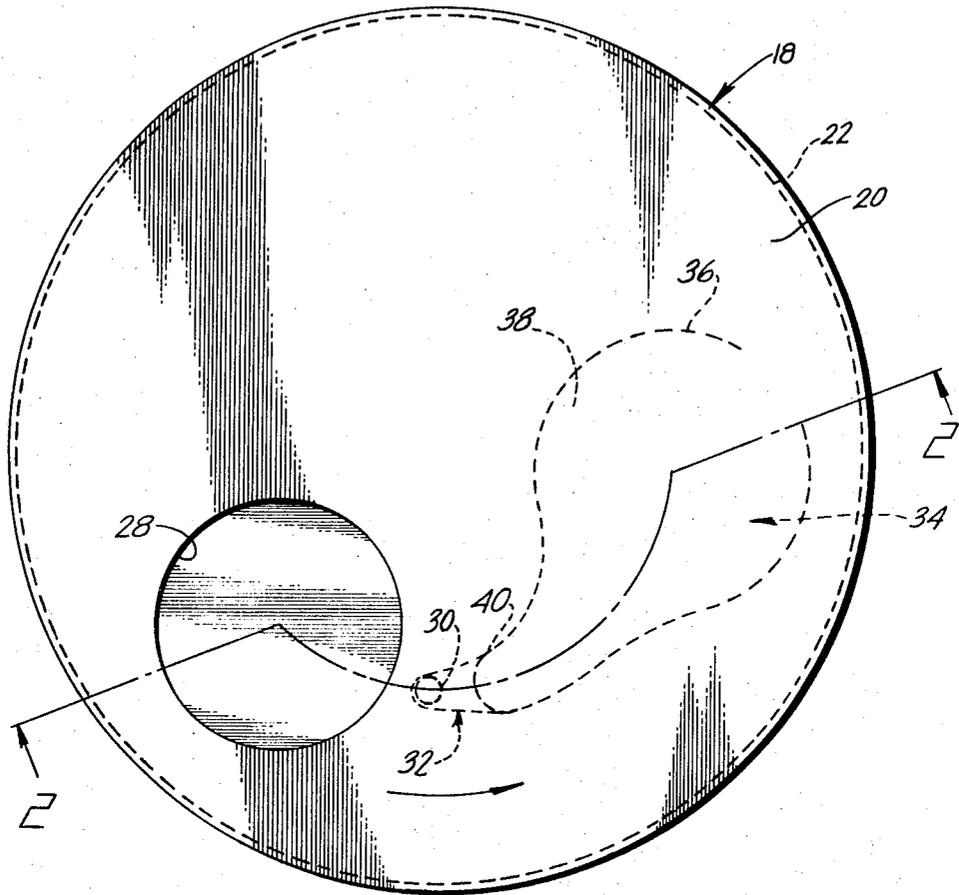


FIG. 1

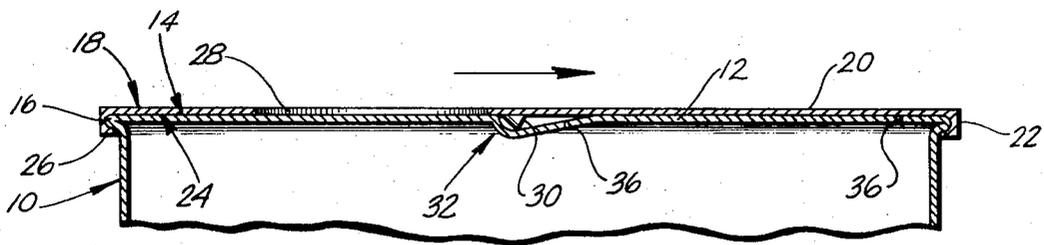


FIG. 2

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FIG. 3

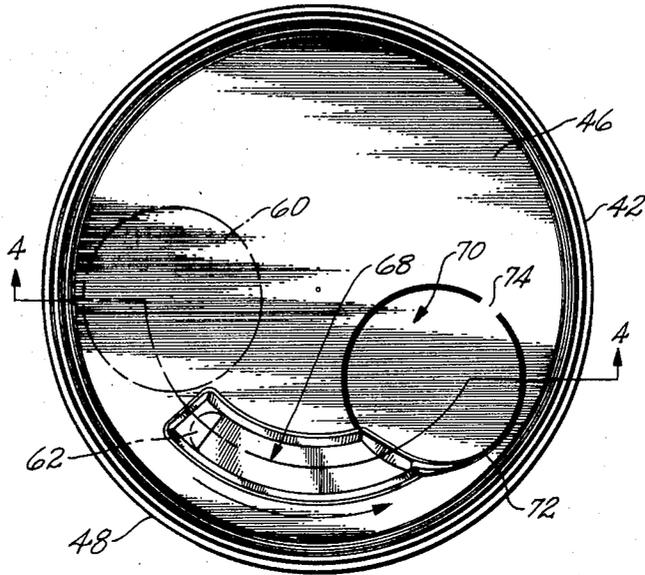


FIG. 4

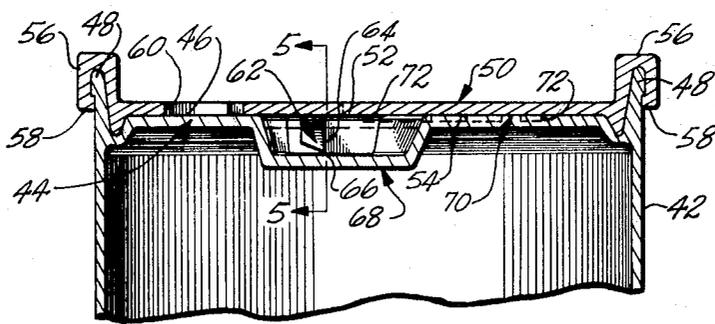
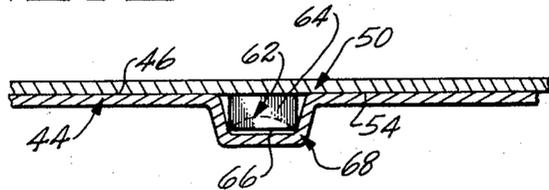


FIG. 5



## EASY OPENING CONTAINER

## CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of my copending application, Ser. No. 834,777, filed June 19, 1969, now abandoned.

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

This invention relates to containers, and more particularly to a rotatable can top adapted to automatically provide an opening for dispensing the contents of the can.

## Description of the Prior Art

Easy opening containers are used extensively in the marketing of liquids under pressure, particularly beer and soft-drinks. This type of can top has been extremely popular in recent years, because it provides a drinking opening quickly without the need for additional can-opening tools. In use, however, the easy opening container has exhibited many disadvantages. For example, the conventional self-opening top includes a detachable top section or pull tab adapted to be manually severed from the top of the can. In the past, many users have complained of cutting their fingers on the razor-sharp edges of removable tabs. In response to these injuries, a flat ring section is generally attached to the front edge of most pull tabs to facilitate their removal. However, in the usual case, the lifting force required to grip the ring section demands a painful amount of pressure to be applied by the fingernails to the underside of the ring. Furthermore, most ring sections are generally spot-welded to the pull tab, and it is not uncommon for the ring to be broken off at its weld, thereby rendering the self-opening top useless.

Conventional easy-opening containers have often proved to be a nuisance. For example, often there is no readily available place for properly disposing of the removable pull tab once it is detached. As a result, removed pull tabs are often carelessly thrown on the ground, thereby causing litter problems and creating potential sources of injury. A further disadvantage of presently known easy opening containers is that once the pull tab is detached from the can, there is no available means for reclosing the can. As a result, drinks are often spilled, and carbonated beverages lose their carbonation relatively quickly unless they are immediately consumed.

## SUMMARY OF THE INVENTION

This invention provides a container with a rotatable auxiliary lid adapted to automatically sever a dispensing opening in the top of the container as the lid is rotated relative to the container.

Briefly, the invention includes a cylindrical container having an upper surface with an eccentrically disposed weakened area. An auxiliary lid is fitted over the top of the container and is adapted to be rotated relative to the top. A downwardly extending tongue on the underside of the rotatable lid fits into a recess in the upper surface of the container top. An opening extends through the lid adjacent the tongue. Preferably, the tongue when positioned in the recess is located between the opening in the lid and a substantial portion of the weakened area.

In use, rotation of the lid forces the tongue to engage the weakened area and sever it from the container top as the tongue rotates with the lid, thereby forming an opening in the top of the container. The rotation of the lid also registers the opening in the lid with the opening formed in the top of the container to provide means for dispensing the liquid in the container.

Preferably, the weakened area is formed by one or more score lines, or closely spaced-apart indentations, arranged in a desired pattern. In the preferred form of the invention, the weakened area defines a relatively circular section or plug having approximately the same size and shape as the opening in the lid. A relatively narrow, generally arcuate recessed area leads away from the plug. The tongue carried by the lid fits in the recessed area. The tongue preferably has a blunt, elongated leading edge substantially as wide as the recess. Rotation of the lid causes the tongue to ride in the arcuate recess until the leading edge of the tongue engages the plug. As the lid is rotated further, the tongue causes the plug to be severed from the container top because of the weakened condition of the plug, and eventually forms a substantially circular opening which registers with the opening in the rotatable lid.

The weakened area severed from the container top is forced by the tongue down into the container as the lid is rotated. This precludes any contact with razor-sharp edges and avoids the litter problems and injuries caused by the disposal of conventional pull tabs. Furthermore, no discomforting amount of pressure need be applied by the user to open the container, because the severed opening is formed simply by grasping the container with one hand and rotating the lid with the other.

Preferably, this invention contemplates securing the rotatable lid to the container in a manner which prevents accidental removal. Further, the rotatable lid can be rotated to close the severed opening, thereby providing an additional advantage over conventional easy opening containers.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan elevational view of an easy opening container showing a rotatable lid in a closed position;

FIG. 2 is a side elevational view taken on line 2—2 of FIG. 1;

FIG. 3 is a plan elevational view of an alternative embodiment of the easy opening container, the rotatable lid being removed from the container top, with the opening in the lid and the tongue carried by the lid being shown in phantom lines for clarity;

FIG. 4 is a side elevational view taken on line 4—4 of FIG. 3; and

FIG. 5 is a side elevational view taken on line 5—5 of FIG. 4.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, this invention includes a hermetically sealed cylindrical container or can 10 adapted to hold liquids such as beer or carbonated beverages. Container 10 is preferably constructed of a plastic material or aluminum. The container defines a thin, substantially circular upper end wall or top 12 having a substantially flat upper surface 14 and a laterally projecting peripheral rim 16.

An auxiliary rotatable lid 18 comprising a thin, disc-shaped member 20 with a downwardly projecting peripheral skirt flange 22 is rotatably fitted over the top of the container. Disc-shaped member 20 has a substantially flat lower surface 24 adapted to engage upper surface 14 when the lid is mounted over the top of the can. Preferably, the lower edge of skirt flange 22 has an inwardly projecting rim 26 adapted to prevent accidental removal of the lid by engagement with the underside of rim 16.

A circular opening 28 extends through the lid 18 eccentric of member 20, and a downwardly projecting tongue 30 is affixed to lower surface 24 adjacent opening 28. When the lid is mounted on the can in its closed position, the tongue 30 fits down into a recess 32 in the inner top 12 of the container. The recess 32 is shown exaggerated in FIG. 2, but provides sufficient space for the downwardly projecting tongue 30 so that the flat upper surface 14 of container 10 abuts against the surface 24 of the lid. This seals the top of the container against the bottom of the lid to prevent liquid from going between the container top and the lid when the container is opened.

The inner can top 12 of this invention includes a weakened area outlined by dotted lines and indicated generally at 34 in FIG. 1. Preferably, the weakened area 34 is formed either by a score line or closely spaced-apart indentations 36 stamped in the upper surface 14 in a desired pattern. It is recognized that various arrangements of score lines or indentations can be used to provide the closed curve weakened line which outlines the weakened area contemplated by this invention. In the preferred form of the invention, a series of closely spaced indentations 36 define a relatively circular section or plug 38 and a narrow arcuate section 40 extending laterally from the lower left-hand portion of the plug 38 into the right hand end of the recess 32. There is a slope at the right hand end of the recess 32 as it transcends into the arcuate section 40. The left end of the arcuate section extends slightly into this slope so as to facilitate severance by the tongue 30.

In use, auxiliary lid 18 is rotated in a counter-clockwise direction as shown by the arrow in FIG. 1. As the lid is initially rotated, arcuate section 40 is severed from the can top by tongue 30 as it moves out of the recess 32 into the narrow arcuate region 40. The tongue forces the arcuate region 40 to separate at the indentations 36 from the rest of the top 12. Further rotation of the lid causes arcuate region 40 to peel downward until finally the circular plug is also peeled downward and severed from the top. The severance of arcuate section 40 facilitates the severance of the relatively larger circular plug section 38. The indentations require a relatively small amount of applied force to sever the areas 40 and 38 from top 12. The gradual circular transition from the region 40 to the plug 38 also allows the plug 38 to be easily torn from the top 12 as the outer top 18 is rotated. The ability of the tongue 30 to force the areas 40 and 38 to be severed from the rest of the can top 12 is enhanced by making the top 12 and lid 18 lock tightly together so that one does not move away from the other or deform under pressure of the tongue 30. The lid 18 preferably is rigid so it is held taut and does not deform as the plug is severed.

Upon severing a substantial portion of the plug, an opening is formed in the can top 12 which registers with opening 28 in the rotatable lid to provide a hole for dispensing the contents of the can. Preferably, the plug 38 is slightly larger in area than the opening 28 in the top 18 so that no portion of the can top 18 protrudes into the hole thus formed.

The tongue preferably does not sever the entire weakened area from the can top, the severed portion remaining attached to the top along a relatively small section of the weakened area. This is insured by leaving a space in the indentations 36 at the right hand end of the plug 38.

Additionally, the tongue 30 serves as a stop for the outer top 18. The tongue 30 engages the top 12 at the right hand edge of the plug 38 and prevents further rotation thereof. In this manner the tongue serves not only to sever the plug 38 but to stop rotation of the top 18. Preferably the tongue 30 is positioned very close to the right hand edge of the opening 28 so that when the tongue stops rotation of the top 18 there is alignment between the openings 28 and the opening formed by removal of the plug 38.

FIGS. 3 through 5 show an alternative embodiment of the invention in which a container 42 has a recessed top 44 with a flat upper surface 46. An upwardly projecting rim 48 on the container 42 extends around the outer periphery of the top 44.

An auxiliary rotatable lid 50 (not shown in FIG. 3 for clarity) having a circular recessed top 52 is fitted over the top of container 42. Top 52 of lid 50 has a flat lower surface 54 which lies on upper surface 46 of container top 44 when lid 50 is fitted over container 44. A downwardly opening annular channel 56 which is substantially U-shaped in cross-section projects upwardly from top 52 of lid 50 and extends around the outer periphery of lid 50. Channel 56 is rotatably fitted over rim 48 of container 42. The lower edge of channel 56 has an inwardly projecting ridge 58 which abuts against a portion of the underside of rim 48 of container 42 to lock auxiliary lid 50 on the top of container 42 and prevent it from moving away during rotation of lid 50 and severing of the opening in the container 42.

A circular, eccentrically disposed opening 60 (shown in phantom lines in FIG. 3) extends through lid 50, and a tongue 62 (shown in phantom lines in FIG. 3) extends downwardly from lower surface 54 of the lid adjacent to opening 60. Tongue 62 may be machined so as to be integral with lid 50, or may be welded to the bottom of the lid. Alternatively, it may be formed from a separate piece of bar stock or the like and fitted tightly in an opening (not shown) in the lid. Although the invention is not limited thereto, tongue 62 preferably is in the form of a semicylindrical piece having a blunt vertical wall surface 64 on the side remote from opening 60 in lid 50. The bottom edge of tongue 62 is bevelled so the bottom edge lies at an angle and intersects vertical wall surface 64 to form an elongated edge 66 at the bottom of tongue 62.

When the lid is mounted in its closed position as shown in FIGS. 3 through 5, tongue 62 fits down into an elongated arcuately curved recess 68 formed in container top 44. The recess which is shown exaggerated in FIGS. 4 and 5, provides sufficient space for tongue 62 so that the entire lower surface 54 of lid 50 lies flat on

top 44 of container 42. As shown best in FIGS. 3 and 5, cutting edge 64 of the tongue is substantially as wide as recess 68.

Recess 68 leads into a weakened area or plug 70 in the top 44 of container 42. The weakened area, which is severed by tongue 62 during use of the container, is preferably circular in shape, although other shapes, such as elliptical, could be used. The weakened area 70 shown in FIGS. 3 through 5 is preferably formed by a closed curve weakened line or score line 72 formed in container top 44, although other means for providing a weakened area and shapes of the weakened area may be used without departing from the scope of the invention. A space 74 in the score line is left at the edge remote from tongue 62 so the entire weakened area is not removed from the container top when lid 50 is rotated.

In use, lid 50 is rotated in a clockwise direction shown by the arrow in FIG. 3 to force the tongue 62 into engagement with weakened area 70 and cause the weakened area 70 to be severed from container top 44. The closed curve score line which outlines the weakened area is weakened to the point that the force applied by the tongue forces severance of the weakened area from the container top. As the lid is rotated the tongue engages the weakened area substantially normal to the weakened line around it and causes the weakened area to be severed in opposite directions around the weakened line. Continued rotation of the lid peels the weakened area or plug down into the container until hole 66 in the lid registers with a matching hole formed by the peeled down weakened area. The elongated recess 68 permits unobstructed rotation of the tongue for a short distance before engaging the weakened area. This gives the tongue substantial momentum when engaging the weakened area so that a relatively small amount of force applied to the lid is required to force severance of the weakened area from the container top. Moreover, the relatively wide blunt leading edge 66 of the tongue provides a substantial area of contact between the tongue and the weakened area to enhance the ability of the rotatable lid to force severance of the weakened area from the container top.

The flat lower surface 54 of top 52 and upper surface 46 of container top 44 are juxtaposed to each other to provide a fluid seal around the opening 60 in the lid and the dispensing opening formed in the container top when the two openings are aligned to prevent liquid from going between the lid and the container top. Alternatively, the lid may have a sealing member, such as a ring-shaped gasket around the opening, between the container top and the lid for sealing the lid and the container top together around the opening.

The entire container top can be recessed and spaced from the lip except for the weakened area which may be provided in a raised portion of the container top. In this form of the invention the tongue fits into the spaced area between the container top and the lid and engages the raised up weakened area to force severance of the weakened area as the lid is rotated. The lid may carry a sealing member around its opening, with the sealing member aligning with the severed weakened area to provide a fluid seal between the container top and the lid.

In another form of the invention the lid may be spaced from the container top except for the area of the opening in the lid which may be recessed so the periphery of the opening and the container top are juxtaposed to each other. In this form of the invention the tongue fits in a recess in the container top and forces severance of the weakened area from the container top as the lid is rotated, with the recessed opening in the lid and the outer periphery of the severed opening being juxtaposed to each other when the two openings are aligned.

I claim:

1. In combination, a cylindrical container having a top with a substantially flat upper surface; means providing an eccentrically disposed weakened area in the upper surface; a recess disposed in the upper surface; an auxiliary lid rotatably fitted over the top of the container and adapted to rotate relative to the container, the lid having a substantially flat lower surface abutting against the upper surface of the top; a tongue projecting downwardly from the lower surface of the lid and extending into the said recess; and an opening disposed in the lid adjacent the tongue, whereby rotation of the lid causes the tongue to engage the weakened area and sever the weakened area from the container top as the tongue rotates with the lid, thereby forming a dispensing opening in the top of the container adapted to register with the opening in the lid to provide means for removing the contents of the container.

2. Apparatus according to claim 1 wherein the recess, and therefore the tongue are located inside the weakened area of the container top.

3. Apparatus according to claim 1 wherein the lower surface of the lid is adapted to abut against the upper surface of the top around the dispensing opening therein when the lid opening is registered with the dispensing opening, so as to provide a fluid seal between the openings.

4. Apparatus according to claim 1 wherein the weakened area defines a substantially circular section having approximately the same size as the dispensing opening in the lid, and a relatively narrow, arcuate section leading from said circular section and encompassing the said recess, whereby rotation of the auxiliary lid, and therefore the tongue, initially severs the narrow arcuate weakened section from the container top, thereby facilitating ease of severance of the said circular weakened section.

5. Apparatus according to claim 4 wherein the substantially circular section of the weakened area includes means for substantially preventing detachment of the severed weakened area from the top of the container.

6. Apparatus according to claim 1 wherein the weakened area is created by at least one score line in the upper surface of the container top.

7. Apparatus according to claim 1 wherein the weakened area is created by seriated indentations disposed in the upper surface of the container top.

8. Apparatus according to claim 1 wherein the tongue is closely spaced from the opening in the lid so that upon severance of the weakened area from the container top and registration of the opening in the lid with the opening in the container top the tongue cooperates

with the opening in the container top to provide means for substantially preventing further rotation of the lid.

9. Apparatus according to claim 1 including means for preventing removal of the rotatable lid.

10. Apparatus according to claim 9 wherein the means for preventing removal of the lid comprises a peripheral shoulder extending outwardly from the container top; a skirt flange extending downwardly from the outer periphery of the rotatable lid; and an inwardly projecting rim integral with the skirt flange adapted to abut against the bottom of the said shoulder to prevent removal of the rotatable lid from the container.

11. Apparatus according to claim 1 wherein the tongue has an elongated blunt leading edge positioned to engage the weakened area and apply a sufficient force to sever the weakened area from the container top as the lid rotates.

12. Apparatus according to claim 1 wherein the tongue has an elongated blunt leading edge, and the recess is an elongated area formed in the container top and having sufficient width to accommodate the blunt edge of the tongue, the recess extending from the tongue to the weakened area a sufficient distance to permit the tongue to move uninterrupted relative to the container top before engaging the weakened area.

13. In combination, a right cylindrical shaped container having a substantially planar enclosing top at one end containing a weakened area eccentrically disposed with respect to the container, the enclosing top having an area which is adjacent to and is recessed with respect to the weakened area; a substantially planar auxiliary lid rotatably mounted on the container over the enclosing top; a tongue carried by the lid and projecting into the recessed area; and an opening disposed through the lid and so positioned that it may be rotated with the lid into juxtaposition with the weakened area, the tongue being positioned so that rotation of the lid causes the tongue to engage the weakened area and force severance of the weakened area from the rest of the enclosing top, thereby forming a dispensing opening in the enclosing top which is registerable with the juxtaposed lid opening for dispensing the contents of the container, the lid and the top each having surface areas which are juxtaposed to each other to provide a fluid seal around substantially all of the lid opening and the dispensing opening when the lid opening and dispensing opening are registered with each other.

14. The combination according to claim 13 in which the juxtaposed surface areas are substantially flat engaging surfaces.

15. The combination according to claim 13 comprising locking means for preventing the lid from separating from the container during severance of the weakened area.

16. The combination according to claim 15 in which the locking means connects the lid and the container together around the outer periphery of the lid and the top of the container.

17. In combination, a right cylindrical shaped container having a substantially planar enclosing top at one end containing a weakened area eccentrically disposed with respect to said container, the weakened area being defined by a substantially closed curve weakened line formed in the enclosing top, said enclosing top having an area which is adjacent to and is recessed with respect to said weakened area; a substantially planar auxiliary lid rotatably mounted on said container over said enclosing top; a tongue carried by the lid and projecting into said recessed area; and an opening disposed through said lid and so positioned that it may be rotated with the lid into juxtaposition with said weakened area, said tongue being positioned so that rotation of the lid causes the tongue to engage the weakened line and force severance of the weakened area from the rest of the enclosing top, thereby forming a dispensing opening in the enclosing top which is registerable with the juxtaposed lid opening for dispensing the contents of the container, the lid and the enclosing top having respective surface portions surrounding the lid opening and the weakened area, said surface portions being located with respect to each other such that they abut against one another when the lid opening is registered with the dispensing opening.

18. The combination of claim 17 wherein said tongue engages said weakened area substantially normal to said weakened line causing said weakened area to be severed in opposite directions along said closed curve weakened line.

19. The combination of claim 18 wherein said surface portions provide a fluid seal around substantially all of said lid opening and said dispensing opening when the lid opening and dispensing opening are aligned with each other.

20. The combination of claim 19 wherein said juxtaposed surfaces are substantially flat engaging surfaces.

21. The combination of claim 18 wherein the opening in said lid is positioned in relation to said tongue so that rotation of the lid for severance of the weakened area simultaneously rotates the lid opening into register with the formed dispensing opening.

22. The combination of claim 18 wherein said tongue has a substantially blunt leading surface which engages said weakened area as said lid is rotated.

23. The combination of claim 18 wherein the recessed area is eccentric with respect to said container top and extends at least up to said weakened area.

24. The combination of claim 19 comprising locking means for preventing said lid from separating from said container during severance of the weakened area of said top.

25. The combination of claim 24 wherein said locking means connects said lid and said container together around the outer periphery of said lid and the top of said container.

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