United States Patent [19]

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[54] **CAN FOR LIQUID**

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[52] **U.S. Cl.** **220/258**, 220/29, 220/268

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

[58] **Field of Search** 220/27, 29, 47, 48; 222/80, 83, 85

[56] **References Cited**

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1,872,585	8/1932	Hegenberger	220/48
3,353,700	11/1967	Kalina	220/1 R
3,363,798	1/1968	Garangiotis	220/29
3,383,007	5/1968	Salamone	222/85

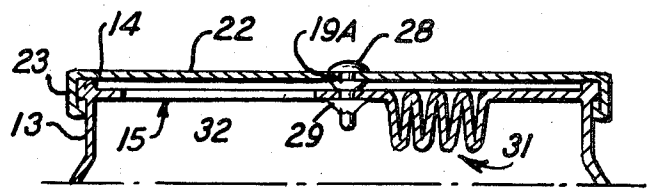
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[57] **ABSTRACT**

This specification discloses a can, preferably for liquid, such as beverage, comprising preferably a corrugated cylindrical body, a disc-like bottom that is attached to the body after the can is filled, and inner and outer disc-like tops. The inner top is scored along two spaced arcuate lines over a sector of about **90°** with the arcuate lines being connected at one end by a curved end scored line. This end of the scored area is formed with an aperture and the remainder of the scored area is scored along spaced transverse or radial lines. The outer top has a peripheral flange that is bent over a bead on the end of the circular body. It is scored along two curved lines which converge away from a rounded end with this end portion being formed with an aperture in alignment with the aperture in the inner top. A headed pin passes through these aligned apertures and is soldered to the inner top.

When a can is to be opened the outer top is first rotated in a counter-clockwise direction which causes the scored area of the inner top to crumple or collapse along the radial scored lines. The outer top is then rotated in a clockwise direction which causes the scored area thereof to be pulled down into the opening left by the crumpling of the scored area of the inner top which action is caused by the scored area of the outer top breaking away from the remainder thereof beginning with the rounded end.

9 Claims, 6 Drawing Figures



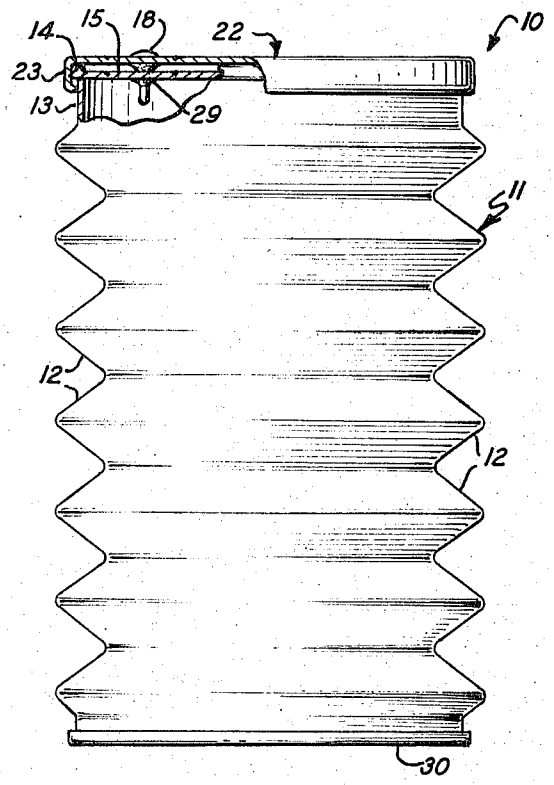


Fig. 1

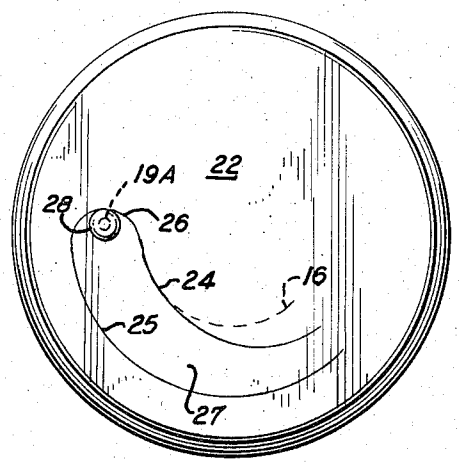


Fig. 2

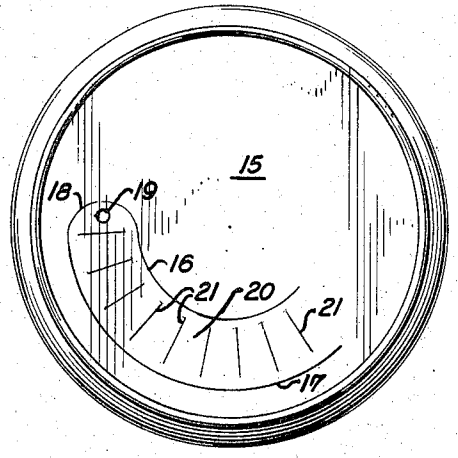


Fig. 3

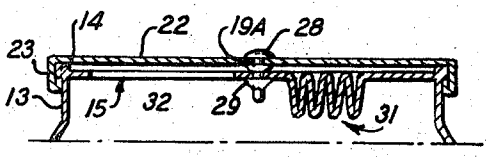


Fig. 4

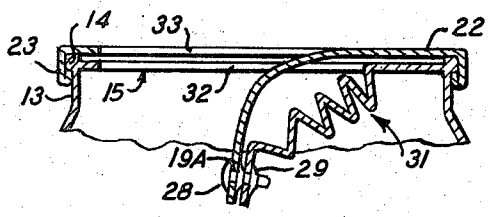


Fig. 5

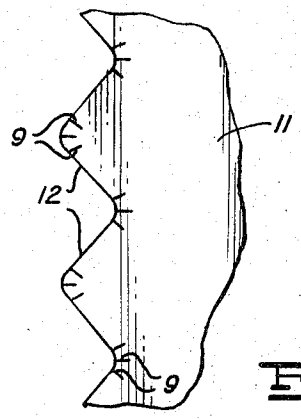


Fig. 6

CAN FOR LIQUID

The present invention relates to cans for liquids and is concerned primarily with a novel top assembly comprising inner and outer tops with the can being opened by first rotating the outer top in one direction and then in the other.

BACKGROUND OF THE INVENTION

The art of cans for liquids has been active in recent years and particularly in the field of providing means for opening, or forming an opening in the top of the can. Certain activity has been in the direction of mounting a can opener which operates with a cutting or shearing action on the can top to form a separable tab.

The cans resulting from these inventive efforts have proven to be satisfactory to an overwhelming degree by the consuming public. Unfortunately, the public has not been properly educated to the hazards of litering the tabs that emanate from cans having such openers. Some efforts have been made to solve the problem. Drastic action has been taken in at least one state which now prohibits entirely cans with commonly employed tab openers. It will, of course, be well appreciated that there is considerable convenience afforded by the use of tab openers. For instance, there never is a need to have a can opener in one's immediate possession.

It would be desirable to provide a can having a tab for providing an aperture to give access to the contents of the can but having means to clearly insure the virtual impossibility of losing the tab. The present invention is concerned with just this type of concept. Some efforts along these lines have been made as is evidenced from the prior art. With regard thereto, attention is directed to such a patent in the patent to Salamone, U.S. Pat. No. 3,383,007. Salamone's efforts have been directed to a device which literally thrusts a portion of the can top inwardly by pressure generated by a cap that is rotatably mounted onto the cylindrical wall of the can. However, the prior art devices may have solved the problem, it was only with the advent of the present invention that the problem was solved as disclosed hereinafter.

While the opening tab constitutes an undesirable problem as mentioned, the very nature of the can itself possesses another undesirable feature. The cylindrical structure of an empty can consumes great bulk per weight. It has been suggested that the cylinder wall be corrugated so that the can may be easily and rapidly compressed axially. Probably, such a prior art can as exemplified by Kalina in U.S. Pat. No. 3,353,700 solves the bulk problem.

Nowhere in the prior art has there been disclosed the present ingenious concept of providing for the opening arrangement and construction for a beverage can, for instance, nor has such an opening arrangement and construction been combined with a unique axially crushable can.

OBJECTS OF THE INVENTION

With the foregoing conditions in mind the present invention has in view the following objectives:

1. To provide a can for liquids which is susceptible of being opened by a couple of simple operative movements and which leaves little possibility for jagged edges at the opening. 2. To provide, in a can for liquids of the type noted, a top assembly comprising an inner top that is fixed to the can body and an outer top which is rotatable on the can body and which when rotated in one direction causes the formation of an opening in the inner top and upon subsequent rotation in the opposite direction, forms an opening in the outer top in alignment with the opening in the inner top, and 3. To provide, in a can for liquids of the character aforesaid, a cylindrical body that is corrugated to provide for the can being collapsed into a compact state for disposal after use.

Various other more detailed objects and advantages of the invention, such as arise in connection with carrying out the above ideas in a practical embodiment, will, in part, become apparent and, in part, be hereafter stated as the description of the invention proceeds.

SUMMARY OF THE INVENTION

The foregoing objects are achieved by providing a can for liquids comprising a corrugated cylindrical body having an external bead or flange at its upper end. Secured to the body at its upper end is a fixed inner top which is scored or weakened along two spaced arcuate lines which are connected at one end by a curved scored line. These arcuate lines have an extent of about 90°. The rounded end of the area defined by these lines is formed with an aperture while the remainder of the scored area is scored or weakened along spaced radial lines.

An outer top is rotatably mounted over the inner top by a peripheral flange which is peened or deformed about the bead on the can body. This outer top is scored or weakened along two spaced curved lines which converge away from a rounded end in relative similar juxtoposition with respect to the area defined by the scores on the inner top. The rounded end of the area is also formed with an aperture in alignment with the aperture in the inner top. A headed pin is passed through these aligned apertures and is soldered to the inner top. The can is completed by assemblying a circular botton on the lower end thereof after the can is filled.

When the can is to be opened the outer top is rotated in a predetermined direction such as counter-clockwise. Due to the connection of the scored area of the inner top to the outer top provided by the pin, this scored area is crumpled along the radial scored lines. When this crumpling is completed, rotation in the counter-clockwise direction is stopped. The outer top is then rotated in the opposite or clockwise direction. Due to the pin connection, the scored area of the outer top is broken free of the remainder thereof and pulled down into the opening left by the removal of the scored area of the inner top.

For a full and more complete understanding of the invention, reference may be had to the following description and the accompanying drawing wherein:

FIG. 1 is a view in side elevation of a can for liquids embodying the precepts of this invention with a portion thereof broken away and shown in section.

FIG. 2 is a top plan view of the can of FIG. 1.

FIG. 3 is a top plan view of the can with the outer top removed.

FIG. 4 is a detailed section depicting the crumpled state of the scored area of the inner top after the outer top has been rotated in a counter-clockwise direction.

FIG. 5 is another detailed section showing the scored area of the outer top pulled down into the opening of the inner top left by the removal of the crumpled scored area thereof caused by rotation of the outer top in a clockwise direction; and

FIG. 6 is a detail, largely diagrammatic, of a portion of the corrugated can body.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings wherein like reference characters denote corresponding parts throughout the several views and, first, more particularly to FIG. 1. A can for liquids made in accordance with the principles of this invention is designated generally **10.** It comprises a body **11** which is generally cylindrical. While the main feature of the subject invention which involves the top assembly to be later described may be included in a can having a smooth cylindrical body; body **11** is shown as formed with corrugations **12.** These corrugations serve a disposal purpose in that they provide for the can being collapsed into a compact condition after use.

Body **11** terminates at its upper end in a cylindrical portion **13** which is formed with an external bead or flange **14.** Secured to the open top defined by cylindrical portion **13** is a fixed inner top **15.** This connection may be achieved in any conventional manner as by a fusion method.

Referring now to FIG. **3,** inner top **15** is scored or weakened along arcuate lines **16** and **17** which are connected at one end by a curved end line **18** which is also scored or weakened. Lines **16** and **17** are of appreciable extent which is in the nature of about 90°. Of course, if the opening to be achieved is to be smaller, the scored lines may extend less than about 90°. Adjacent curved end **18,** the so-called "scored area," that is, the area enclosed by the scored lines, if formed with an aperture **19.** This scored area which is identified at **20** is further scored or weakened along a plurality of spaced radial lines **21.**

Referring now to FIGS. **1** and **2,** an outer top is designated **22.** Its periphery is peened or bent about bead **14** as indicated at **23.** This may be accomplished in a well known manner such as by forming radial cuts in the peripheral portions before the metal deforming operation. Bead **14** and flange **23** cooperate to rotatably mount outer top **22** on body **11.**

As depicted in FIG. **2,** outer top **22** is scored or weakened along curved lines **24** and **25** which converge away from a curved end line **26** which is also scored and weakened. Lines **24, 25** and **26** enclose another so-called scored area **27** which is of substantially the same arcuate extent as area **20** of inner top **15.** That portion of area **27** adjacent to end **26** is formed with an aperture **19A** that can be more readily discerned in FIGS. **4** and **5.**

As shown in FIG, **2** the outer top **22** is assembled on body **11** with the aperture **19A** in area **27** brought into alignment with aperture **19** of area **20.** For further elucidation, FIG. **2** reveals an arcuate line. This represents that portion of scored line **16** of the inner top **15** which is co-extensive with the scored lines of the outer top **22.** A headed pin **28** is passed through the aligned apertures with its head on the exterior of outer top **22.** This pin is then fixed as by soldering, for instance, in aperture **19** as indicated at **29.** The body **11** is then filled with a desired liquid, such as a beverage, being inverted for this purpose. A bottom **30** is then attached to the end of body **11** remote from the top assembly. While a pin means for securing together the two scored areas has been illustrated in the above, it is contemplated that the applicable means may be employed, such as rivets, bolts or welding, for instance. Those skilled in the art will, of course, think of other means.

Now, turning to FIG. **6,** the corrugations **12** are scored at the leading edges thereof with weakening portions **9** to assist in rapid collapse of the empty can when desired.

OPERATION

While the manner in which the subject can function is believed to be obvious from the illustration of the drawing and description of parts set forth above, it is briefly described as follows:

While it will be understood that a can embodying the precepts of this invention may be designed so that the first rotation of outer top **22** may be either clockwise or counterclockwise, the opening operation will be described with reference to the can construction illustrated which calls for initial rotation of outer top **22** in a counter-clockwise direction.

As this rotation takes place, pin **28** breaks scored area **20** of inner top **15** away from the remainder of the inner top beginning with the line **18** and then progressing along lines **16** and **17.** As area **20** is so broken free it crumples along radial lines **21** into the folded state shown at **31** in FIG. **4.** When this condition is achieved, further rotation in a counterclockwise direction is restricted because the crumpled folds **31** act as a stop.

Outer top **22** is then rotated in a clockwise direction. It is noted that the formation of folds **31** leave an opening **32** in the inner top **15.** As outer top **22** is rotated pin **28** first breaks area **27** free of the remainder of outer top **22** along curved end line **26** and then progressively along lines **24** and **25.** This pulls curved end **26** down through opening **32** and into the can body as indicated in FIG. **5.** Thus an opening **33** is formed in outer top **22** and substantially in alignment with opening **32.**

It is notable that this pulling away of area **27** is due to the fact that the crumpled folds at **31** offer a greater resistance to the rotative movement than do the scored lines **24, 25** and **26,** taken in combination with the fact that the end portion of scored area **27** is smaller than the end portion of scored area **20.** Thus, when the inner and outer tops are constructed of metal, the metal breaks free along these lines. While the present descriptive rendition has been in conjunction with the use of metal as evidenced by the cross-hatching in the drawings, it is contemplated that other applicable materials will be used and arrangement and construction of the present invention will be well within the purview of such other materials already developed and to-be-developed, such as various plastics.

While a preferred specific embodiment is herein disclosed, it is to be clearly understood that the invention is not to be limited to the exact construction, devices and designs illustrated and described because various modifications of these details may be provided in putting the invention into practice.

What is claimed is:

1. In a can

a. a cylindrical body presenting upper and lower ends,

b. an inner top affixed to said upper end and having a scored area defined by a pair of spaced arcuate lines and an end line that are weakened, and a plurality of spaced radial lines in said scored area that are weakened,

c. an outer top rotatably mounted on said body above said inner top and having a scored area defined by a pair of spaced curved lines that extend in substantially the same direction as the arcuate lines on the inner top and an end line that are weakened,

d. means for securing together the scored area portion at substantially the end line of the inner top with the scored area portion at substantially the end line of the outer top

e. a bottom closing the lower end of said body.

2. The can of claim **1** in which said scored areas have an arcuate extent of substantially 90°.

3. The can of claim **2** in which the end lines of the scored areas are curved.

4. The can of claim **3** in which the curved lines in the outer top converge away from the curved end line.

5. The can of claim **1** wherein the inner top has an aperture in said scored area adjacent to said end line thereof and the outer top has an aperture in said scored area adjacent to said end line thereof, said apertures being aligned, and said means for securing together the scored area portions being a pin means passing through said aligned apertures.

6. The can of claim **5** in which the pin is headed adjacent the outer top and is soldered to the inner top.

7. The can of claim **1** in which the body is formed with an external bead on its upper end and the outer top has a flange peened about said bead.

8. The can of claim **1** in which the body is corrugated.

9. The can of claim **8** wherein the leading edges of the corrugations are weakened with score lines.

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