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3,229,847

EASY-OPEN CAN END CLOSURE

Filed June 7, 1963

2 Sheets-Sheet 1

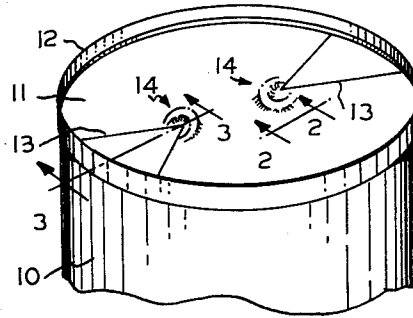


FIG. 1

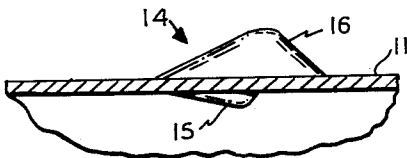


FIG. 2

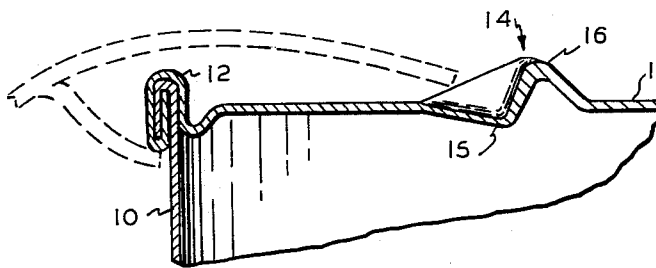


FIG. 3

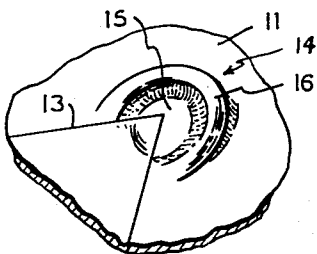


FIG. 4

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2 Sheets-Sheet 2

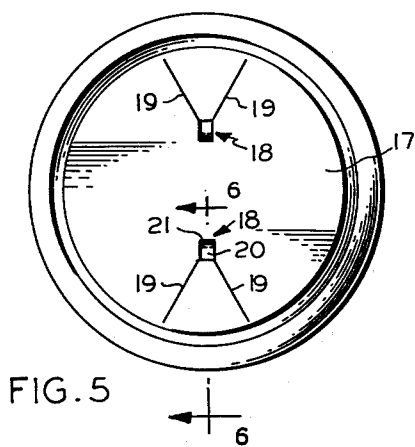


FIG. 5

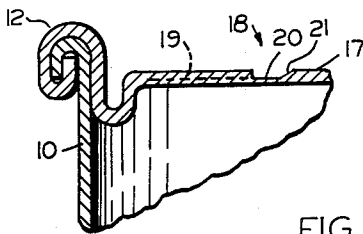


FIG. 6

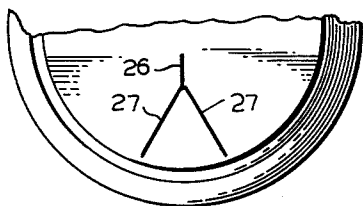


FIG. 7

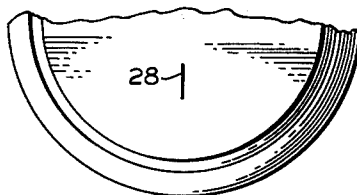


FIG. 8

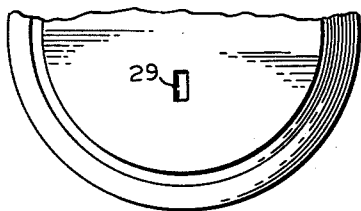


FIG. 9

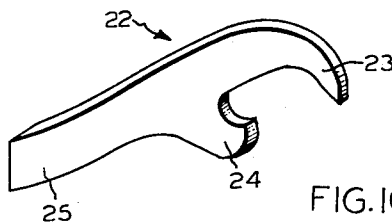


FIG. 10

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EASY-OPEN CAN END CLOSURE

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7 Claims. (Cl. 220-48)

This invention relates to an improved easy-open end for beverage cans, and more particularly to a metal end closure provided with score lines and dimpled locating areas which cooperate in a novel manner to insure rapid, easily effected opening of the can by a punch type can opener which is fulcrumed about the container end seam.

Efforts have been made to facilitate the opening of cans having metal end closures seamed thereto, as by providing a pattern of score lines on the can end for use with a fulcrumed punch opener, or score lines in association with a pull tab or tear tongue attached to the can end. The use of prescored areas along in the can end, however, normally requires accurate positioning of the can opener relative thereto, in order to fracture the metal along the score lines with minimum effort. When the punch opener, however, is misaligned with the score lines, extra effort is required in opening, and also a lateral tear in the metal or jagged strip can result. On the other hand, when pull tabs are provided in association with score lines, special equipment is necessary to attach the tab to the can end, as well as requiring additional material for the tab itself, thereby appreciably increasing unit cost of an extremely high-volume product.

It is therefore a principal object of my invention to provide an easy-open end closure for a beverage can or the like which obviates the need for additional material as well as the likelihood of an irregular or ragged edge opening due to misalignment of the punch opener with score lines.

It is a further important object of my invention to provide a scored can end wherein proper alignment of the can opener with the score lines or other weakened area is assured by means of locating areas integrally formed in the metal can end.

Another object of my invention is to additionally facilitate the opening of metal beverage cans or the like not only by use of score lines and opener-aligning means in the lid, but also by providing an area of reduced lid thickness at the locale where the punch opener initially engages the can to thereby insure ready rupture thereof.

A further object of my invention in one embodiment thereof is to assist the consumer in positioning the can opener by means of a U-shaped integrally formed protuberance surrounding a depressed lid portion, which protuberance also protects the scored and thinned areas of the can lid from inadvertent fracture.

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

FIG. 1 is a fragmentary perspective view of a container illustrating a preferred form of my improved easy opening lid construction;

FIG. 2 is a partial section through the lid taken on line 2-2 of FIG. 1;

FIG. 3 is a partial section taken on line 3-3 of FIG. 1, further showing a conventional triangular punch hook can opener in phantom lines;

FIG. 4 is an enlarged fragmentary view of a portion of my improved can end closure.

FIG. 5 is a plan view of a can end illustrating a second embodiment of my invention;

FIG. 6 is a partial section through the modified lid taken on the line 6-6 of FIG. 5;

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FIG. 7 is a fragmentary plan view of a can end illustrating a third embodiment of my invention;

FIG. 8 is a fragmentary plan view of a can end illustrating a fourth embodiment of my invention;

FIG. 9 is a fragmentary plan view of a can end illustrating a fifth embodiment of my invention;

FIG. 10 is a perspective view of a fulcrum can opener which may be employed in opening the end closures of my invention.

Referring to the drawings, a beverage container, such as a beer can, is shown at 10 in FIG. 1, the can being provided with a metal end closure 11 seamed thereto in a conventional peripheral double seam or end chime 12. The end closure 11 is provided with a pair of diametrically opposed V-shaped score lines 13 which converge radially inwardly from the lid periphery. The angle between the score lines and the radial inward extent thereof correspond substantially to that of the conventional triangular punch can opener which is fulcrumed about the end seam 12 as illustrated in phantom lines in FIG. 3.

As hereinbefore indicated, it is preferred to use more than merely a V-shaped score line in a can closure in order to assure easy, clean opening of the can. This is because the can opener must be substantially aligned with the V-shaped score in positioning the hook of the opener upon the container chime. Inasmuch, however, as in manually placing the can opener in overlying relation to the can lid, a view of the score lines may be blocked, and further as the hook opener may with equal facility be positioned at any circumferential locale along the chime, it is readily apparent that the can opener can become laterally misaligned with the effective area of the score lines. Thus, upon depression of the can opener, the resultant triangular opening may not commence at the vertex of the scores, nor run coincident with but rather parallel to the outwardly extending legs of the score lines, whereby the intended ease of opening of the can by the provision of score lines is not achieved as the lid is cut and torn along unscored portions thereof. Further, depending upon the proximity of the misaligned can opener to the score lines, the metal may tend to tear laterally during opening to intersect the weakened score line, resulting in an irregular or jagged triangular opening in the can with attendant hazards.

Accordingly, my improved can lid 11 in the preferred embodiment of FIGS. 1-4 has in cooperative association with the V-shaped score lines 13 opener-locating means generally indicated at 14. Locating means 14 is disposed at the vertex of the score lines 13 and serves in part to properly orient the can opener with respect to the scores.

The locating means 14 includes a central depressed dimple area 15 and an upstanding bulge or protuberance 16 of U-shaped or horseshoe configuration. The open end of the U-shaped protuberance 16 faces radially outwardly, the terminal ends thereof being disposed adjacent and on either side of the converging score lines 13, the vertex of which latter is located substantially centrally of the dimple 15. As seen in FIGS. 2 and 3, the dimple 15 inclines downwardly radially inwardly of the lid 11, while the protuberance 16 rises smoothly from the radial outermost portions thereof to the central connecting portion at its innermost radial extent. The bulge 16 is fairly smoothly rounded throughout. Accordingly, it will be seen that in positioning the hook opener on the container chime 12, the punch point thereof may be readily located so as to overlie the dimple 15, within and surrounded by visible protuberance 16. Any slight misalignment of the can opener in this regard whereby the same engages the sloped wall of the protuberance will cause the can opener to be effectively cammed

into the depression 15. Accordingly, the opener will be surely aligned with the scores 13, whereupon the opener may be pivoted to effect clean opening of the can along the weakened score line area with absolute minimum effort.

In the opening of cans by lever-type openers, it is the initial puncturing of the metal closure which requires the greatest amount of force. In this connection it is pointed out that metal closure 11 at the dimple 15 is somewhat thinner than the surrounding portions of the lid, whereby the same will rupture easily at this point of maximum opener leverage pressure, after which it is an extremely simple task to continue the tear along the score lines 13.

The U-shaped protuberance 16 is slightly thicker than the surrounding lid to maximize strength around the relatively weak area of the depression 15 wherein the metal is not only thinner but is also the locale of the converging score lines 13. Accordingly, any normal or inadvertent shock in handling of the cans will be received by the upstanding protuberance 16, thereby preventing likelihood of direct pressure being applied to the thinned and weakened area of depression 15.

It is apparent that the locating and fracture-initiating areas 14 in the can lid do not require additional material, as is the case with pull tabs or the like, but may be readily formed in the lid by die-shaping and stamping thereof, in the ordinary process of shaping the lid for connection to a can body. Thus, manufacture of the instant end closure requires only a modification of the lid shaping or stamping dies to effect integral formation of the depressed portion 15 and surrounding U-shaped protuberance 16. Alternatively, the depressed portion 15 and surrounding U-shaped protuberance 16 can be formed in a separate operation from the formation of the lid.

FIGS. 5 and 6 illustrate a first modified form of my invention wherein a depressed locating area 18 cooperates with score lines 19 converging inwardly from the closure periphery. The locating area 18 is disposed substantially at the imaginary apex of the score lines 19 and is substantially rectangular in plan outline rather than being circular or curved as in FIGS. 1-4. The locating area 18 includes a substantially flat depressed portion 20 at which point the metal of lid 17 is thinnest to facilitate easy puncture by the can opener, while radially inwardly of the portions 20 is an inclined rear wall 21 extending between depression 20 and the cover surface. As seen in FIG. 6, the depth of the depressed portion 20 of locating area 18 is substantially equal to the vertical cut of score lines 19. As is clearly seen in FIG. 5, the score lines 19 intersect the rectangular area 18 at the radially outermost corners thereof, whereby the score lines 19 and the forward end of the depression 20 effectively form a blunted vertex.

The indented locating area 18 is formed by shaping of the closure 17 between suitable die members, and in this connection the provision of an inclined face on the die to form the rear inclined wall 21 is important in effecting the proper formation of the depressed portion 20, in permitting the metal displaced from the indentation 20 to smoothly flow rearwardly or radially inwardly to form the inclined wall 21 and away from the blunt portion of the die which shapes area 20.

As before, the means 18 facilitates the proper locating and orienting of the conventional triangular punch-type can opener with the score lines 19.

The form of the invention shown in FIGS. 5 and 6, however, is even of greater value when a flat stock fulcrum can opener 22 as shown in FIG. 10 is employed. The opener 22 is stamped from flat stock to the outline configuration illustrated, including punch point 23, fulcrum chime 24 and lever handle 25. As such, the opener 22 is quite easily fabricated in a single operation, in contrast to the conventional triangular punch opener, which latter must be shaped after initially stamping the same

from flat stock, as well as the further operation of striking the fulcrum tongue thereof from the body of the opener. Further, the opener 22 facilitates packaging and marketing thereof in that the totally flat character of the same permits the opener to be securely and simply attached to a beer carton or case as by an adhesive spot or strip or tape.

It will be seen that the flat stock opener 22 of FIG. 10 has an effectively rectangular cross-section at the punch point 23 which conforms to the rectangular outline of locating area 18 in the lid of FIG. 5, whereby alignment of the opener is insured and positive tearing of the metal cleanly along score lines 19 can be achieved.

FIG. 7 illustrates a further modified form of my invention wherein the locating area 26 comprises a radial score line which extends radially inwardly from the vertex of the converging scores 27. The radial score 26 also provides both a visible and tangible means of locating and centering either the conventional triangular opener or or the strip stock opener of FIG. 10, and the extension of the locating score 26 radially inwardly from the V-score vertex insures proper opening of the can despite slight differences in the effective length of punch type can openers as supplied by various manufacturers.

A further modified form of the invention is shown in FIG. 8 wherein the locating score 28 is radially directed and corresponds substantially to the score 26 of FIG. 7. In FIG. 8, however, the V-shaped score lines have been omitted. This form of the invention is especially suitable when the can end is of softer metal such as aluminum, wherein it is often unnecessary to provide the guiding V-scores, but wherein the score 28 serves to not only locate the opener but to provide a weakened and thinned portion which will yield readily to effect the more difficult initial punching of the metal prior to the more easily effected subsequent radial outward tearing thereof by the can opener.

FIG. 9 is similar to FIG. 8 in eliminating the V-scores, but wherein the locating area 29 is of substantial transverse breadth to thereby present a generally rectangular indentation much as at 18, FIG. 5. This form of the invention also cooperates well with the strip stock opener of FIG. 10 in serving to provide a large weakened area to be initially punctured by the opener wherein the width of the locating depression 29 is substantially equal to the width of the strip stock can opener 22.

While I have illustrated diametrically opposed pairs of cooperating score lines and/or locating area formations, it is apparent that only a single such arrangement may be employed, or, alternatively, a plurality of cooperating score lines and/or locating means may be provided in circumferentially spaced relation about the can lid if deemed advisable.

The metal lid may of course be associated with any conventional can body, such as a metal body having an interlocked side seam, an extruded aluminum cup body, or a composite foil-fiber body, while the lid itself may be of tin plate or more ductile aluminum. In general, an aluminum lid is more easily shaped to provide the several novel cooperating score line and locating structure arrangements as herein disclosed.

Similarly, while an exemplary container herein has been a beer can, it is obvious that my end closure construction may be applied to cans containing other liquid or granular commodities, as oil, salt, syrup, etc.

What is claimed is:

1. An easy-open container end closure adapted to be opened by a punch-type opener, said closure having a radially inwardly converging V-score terminating at its vertex in a depressed portion of said closure, and a generally U-shaped protuberance formed in said closure and partially surrounding said depressed portion with the open end of said protuberance facing radially outwardly.

2. An easy-open container end closure adapted to be opened by a punch-type opener, said closure having a

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radially inwardly converging V-score terminating at its vertex in a portion of said closure which is depressed beneath the normal plane thereof, said closure at said depressed portion having a thickness less than that of the surrounding substantially planar areas of said closure.

3. The end closure of claim 2 further having a substantially U-shaped protuberance partially surrounding said depressed portion with the open end of said protuberance facing radially outwardly.

4. The end closure of claim 3 wherein said depressed portion inclines downwardly radially inwardly thereof.

5. A container having a metal end closure secured thereto in a peripheral chime having means facilitating the positioning of a chime-fulcrumed punch opener thereon, said means comprising a depressed portion of said closure disposed radially inwardly of said chime a distance corresponding to the effective length of the punch portion of said can opener to receive and locate the terminal point of said opener, and a radially outwardly facing U-shaped protuberance in said closure partially surrounding said depressed portion thereof for guiding thereinto said opener terminal point.

6. An easy-open container end closure having radially inwardly converging V-shaped score lines adjacent the periphery thereof, and means for facilitating the positioning of a punch-type can opener with respect to said score lines, said means comprising an integrally formed portion of said closure extending outwardly of the plane thereof, said portion being located adjacent the vertex of said score lines and in partially surrounding relation thereto.

7. An easy-open end closure secured to a container in

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a peripheral chime and adapted to be opened by a fulcrum punch-type opener, said closure having means for facilitating the opening thereof by said opener, said means comprising:

a weakened and thinned locating area on said closure, said area including a first portion thereof spaced radially inwardly of said chime by a distance corresponding to the length of said opener between its fulcrum and punch point and including a second portion thereof disposed radially inwardly of said closure from said first portion, said locating area first portion being depressed beneath the level of surrounding areas of said closure to thereby tactually aid in the manual positioning of said opener in alignment therewith, and said second portion including a radially outwardly facing U-shaped protuberance in said closure surrounding said weakened and thinned area of said first portion thereby to provide visual aid in positioning said opener.

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