

[54] CONTAINER WITH RECLOSURE APPARATUS

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Related U.S. Application Data

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[52] U.S. Cl. 220/278

[51] Int. Cl. B65d 17/00

[58] Field of Search 220/41, 47, 48, 44, 51, 220/277, 278, 252, 253, 265

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Primary Examiner—William I. Price

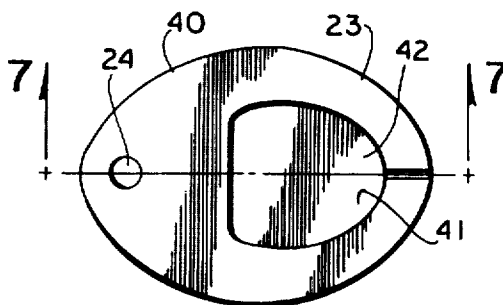
Assistant Examiner—Ro. E. Hart

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[57] **ABSTRACT**

Container top which is useful as a closure for beverage containers and the like and which is openable without requiring a can opener or other additional implements, which does not require removal of a tear tab or a similar disposable article, which does not deposit a detached closure member within the container, and which is noninjurious to the user. The container top is provided with a scored section which can be deformed from the container top to lie inwardly of the container. An opening member attached to the container top includes a tab displacing portion for separating the tab along the scored line, and also includes a deforming portion for deforming the tab from the top. The opening member is movable from a non-use position into alignment with the scored tab, and may contain an aperture coincident with the opening presented by deformation of the tab, through which the contents of the container are accessible. In another disclosed embodiment of the present apparatus, the opening member provides a removable closure for an opened container.

9 Claims, 12 Drawing Figures



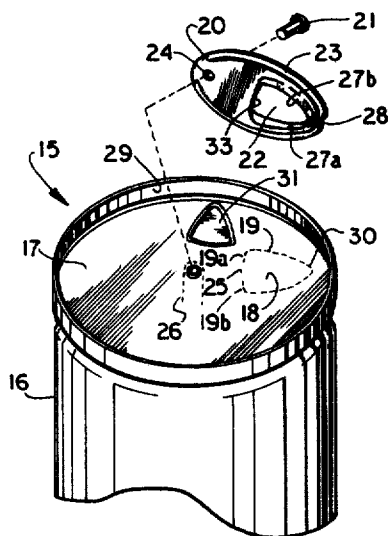


FIG 1

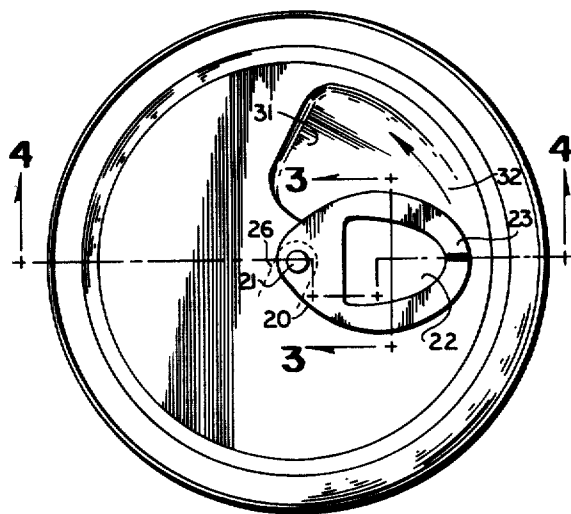


FIG 2

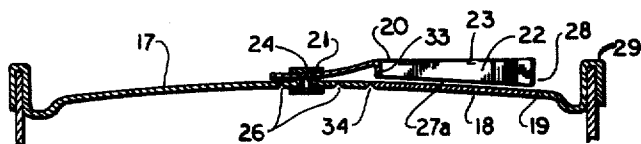


FIG 4

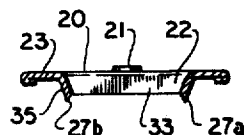


FIG 3

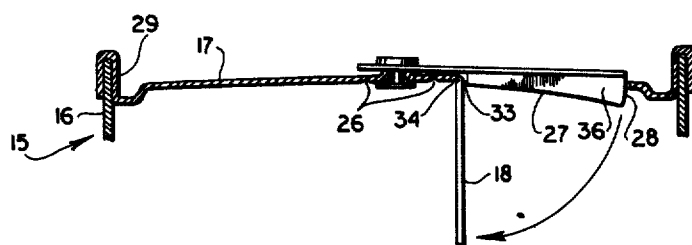


FIG 5

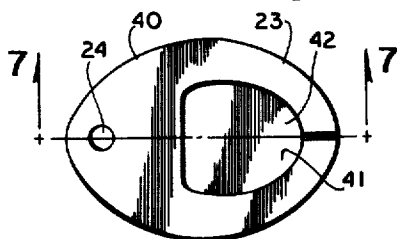


FIG 6

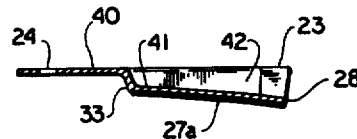


FIG 7

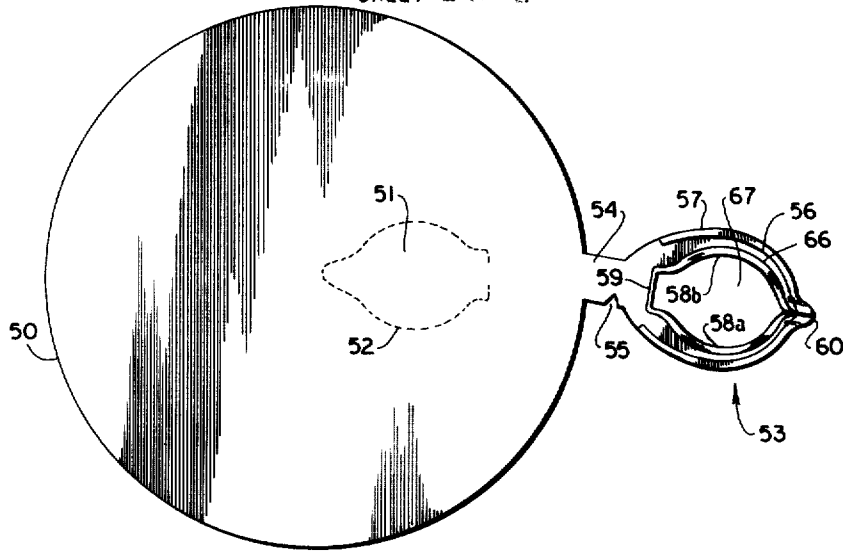


FIG 8

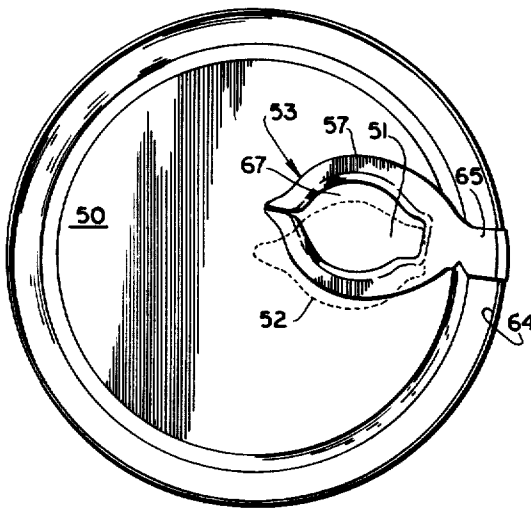


FIG 9

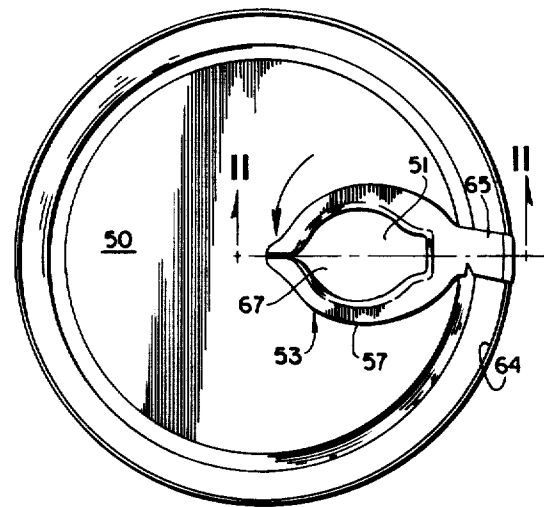


FIG 10

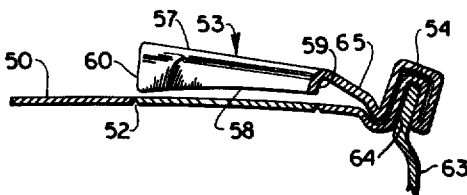


FIG 11

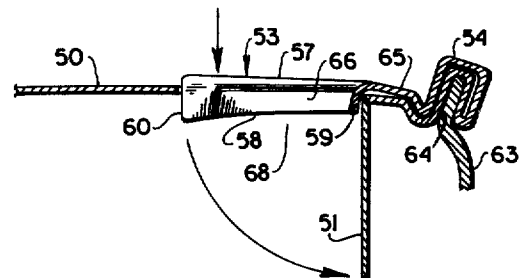


FIG 12

CONTAINER WITH RECLOSURE APPARATUS

This is a continuation, of application Ser. No. 216,709, filed Jan. 10, 1972, now U.S. Pat. No. 3,807,597.

This invention relates in general to containers and in particular to an improved container top which is self-opening.

The conventional self-opening container of the type commonly known as the "pop-top" container and widely used for beverages and other purposes is notoriously wellknown to those skilled in the container and packaging arts. These containers typically include a container end having a tab portion provided according to one of several known expedients and defined by a suitable metal-weakening operation such as scoring. The tab portion is attached to a pull ring, and opening of the container is accomplished by pulling the ring for tearing removal of the tab along the score lines. The near-universal acceptance of this type of easy-open container is amply demonstrated by visiting any producer or retailer of popular beverages such as beer and soft drinks, and also by the ubiquitous appearance of letter caused by carelessly discarded tear tabs.

Modifications of the conventional pop-top container have been proposed in an attempt to eliminate a removed article, such as the tear tab and attached ring, while retaining the easy-open feature which is popular with consumers. One such proposal, for example, provides one or more separate plug portions mounted in holes formed in an end of the container. The mounting of the plugs enables finger pressure to be applied directly against the plug portions from the outside of the container end to physically dislodge the plugs into the container. These plugs then drop to the bottom of the container, and are thus not available as potentially littering material. However, this proposed solution includes a number of problems which may be detrimental to its public acceptance. For one thing, the presence of one or more plugs in a beverage can is unsettling to a person drinking from the can, especially so when he hears the plug moving about in the container while he is drinking from it. Moreover, the hole or opening left in the container end by the aforementioned push-in opening procedure presents a potential injury hazard to the finger of a person opening the container and also to the tongue and/or lips of a person drinking from the container.

Still another objection to the aforementioned modified self-opening container is found in the relative expense of manufacture, as compared with the conventional pop-top container end.

Other examples of prior-art attempts to provide a self-opening container which omits the conventional detached tear tab/pull ring are found in such U.S. Pat. Nos. as 3,355,058; 3,442,416; and 3,160,309. None of the containers proposed by these cited patents is known to have achieved commercial acceptance, however, for such reasons as unacceptable cost of manufacture, difficulty of opening, and/or factors which are psychologically unappealing to the consumer of the beverages or other products in the containers.

Still another problem confronted by the container art and in particular by the increased popularity of relatively large cans, such as a No. 9 can, for various carbonated beverages, is the need for some closure device so that an opened can can be closed for storage to

maintain the carbonation and freshness of the beverage for subsequent use.

Accordingly, it is an object of the present invention to provide an improved self-opening container.

It is another object of the present invention to provide a self-opening container in which container opening is accomplished without complete separation of any article from the container.

Still another object of the present invention is to provide a self-opening container in which opening of the container does not dispose any loose unattached object within the container.

A further object of the present invention is to provide a self-opening container which minimizes or eliminates the potential hazard of personal injury during opening of the container.

Another object of the present invention is to provide a self-opening container which can be selectively closed and opened after initial container opening takes place.

Many of the other objects and attendant advantages of the present invention will become more readily apparent from the following description of working embodiments thereof, including the annexed drawings in which:

FIG. 1 shows an isometric exploded view of a container portion including an end member containing self-opening structure according to an embodiment of the present invention;

FIG. 2 shows a top plan view of the assembled container end shown in FIG. 1;

FIG. 3 is a section view of an opening member taken along line 3—3 of FIG. 2;

FIG. 4 is a section view taken along line 4—4 of FIG. 2, showing the self-opening structure in position to be opened;

FIG. 5 is a section view taken along line 4—4 of FIG. 3, showing the container as opened;

FIG. 6 is a top plan view of a self-opening container top structure according to a second embodiment of the present invention;

FIG. 7 is a section view taken along line 7—7 of FIG. 6;

FIG. 8 is a top plan view of a blank for a container end according to a third embodiment of the present invention;

FIG. 9 is a top plan view of the blank as shown in FIG. 8 and installed as an end on a container;

FIG. 10 is a top plan view of the container end of FIG. 9, moved into container opening position;

FIG. 11 is a section view taken along line 11—11 of FIG. 10, showing the container of the third embodiment in position for container opening; and

FIG. 12 is a section view taken along line 11—11 of FIG. 10, showing the container of the third embodiment as opened.

Stated in general terms, the self-opening container of the present invention includes a container end with an opening tab preformed therein by a suitable operation such as scoring or severing of the metal or other material from which the container end is fabricated. An opening member is associated with the container end and includes a portion which can be pressed against the preformed opening tab to force the tab from the container end and inwardly of the container without necessitating complete removal therefrom. The opening member may be movably attached to the container end

to be received in a storage well before the container is to be opened, and can be moved into opening position disposed over the opening tab. The opening member can be provided with a passage aligned with the opening of the opened container, for drinking or pouring the contents of the container, or may be alternatively provided with a closure portion for closure of the opened container. In another disclosed embodiment of the invention, the opening member is formed as an integral part of the container end and is folded over the chime portion of the container during manufacture to be positioned in proximate location with the preformed opening tab.

More particularly and with reference taken to FIGS. 1 and 2, there is shown generally at 15 a container such as a conventional beverage can and having a cylindrical body 16 with an end member 17. An opening tab 18, shown in broken line in FIG. 1, is defined in the end member 17 by a suitable metal-weakening operation such as scoring 19 or the like. Although the scoring in the present embodiment is depicted as being provided on the inside of the end member, that is, the side of the end member facing the interior of the container, the scoring may optionally be provided on the outside of the end member or on both sides thereof in opposed alignment. The tab 18 of the present embodiment is defined along both sides thereof by the scoring 19, and is defined along the end or bend line by scored portions 19a and 19b which are separated by an unscored segment 25. The purpose of the unscored portion 25 will become apparent below.

An opening member 20, shown detached in the exploded view of FIG. 1, is movably attached to the end member 17 by a suitable attachment device such as a rivet 21 affixed to or through the end member 17, with the rivet 21 passing through a hole 24 in the opening member 20 of sufficient size to permit the opening member to be manually movable over the end member 17. The opening member 20 has a tab covering portion including an aperture 22 defined by a surrounding rim 23. The area of the end member 17 around the rivet 21 may include a pressure release member defined by the scoring 26 partially surrounding the location whereat the rivet is affixed to the end member.

Disposed on the underside of the opening member 20, to be in confronting relation with the end member 17 of the container, are severing or parting edges 27a and 27b defining substantially the same outline as the opening tab 18 defined by the scoring 19. These parting edges 27a, 27b preferably include a point 28 situated at the end of the opening member 20 which is remote from the location of attachment of the opening member to the container. It can be seen from FIG. 1 that the outline of the opening tab 18, for the presently disclosed embodiment of the invention, extends toward the chime 29 of the container to form a tip 30, and this tip is the portion of the outlined opening tab 18 which is first contacted by the point 28 of the parting edges 27a, 27b, as will become more apparent below.

The end member 17 has a recess 31 formed therein by a stamping operation or by any other suitable process, with the dimensions of the recess being adequate to receive at least the parting edges 27a, 27b of the opening member 20. The opening member 20 can be rotated around the rivet 21 to assume a position wherein the rim 23 and the aperture 22 of the opening member substantially overlie the recess 31, with the

parting edges 27a, 27b disposed in the recess. The recess 31 may take the shape of a depression formed in the end member 17, as shown in FIG. 1, or the recess alternatively may include a sloped region 32 as shown in FIG. 2 to provide a ramp for moving the opening member 20 from the recess to a position overlying the opening tab 18.

In considering the operation of the embodiment described thus far, it will be assumed that a container 15 filled with a substance such as a beverage has been provided with a self-opening container top as described herein, with the opening member 20 as installed on the end member 17 initially positioned in or over the recess 31. In this way, any unexpected force or pressure applied to the opening member 20 during the shipping or other handling of the container cannot cause inadvertent opening of the opening tab 18. When a person desires to open this container, assuming that the end member 17 includes the pressure release member defined by the scoring 26, he first raises or lifts the opening member 20 away from its position as normally received in the recess 31, so that the bending force applied through the rivet 21 to the end member 17 causes at least part of the scoring 26 to break or tear. This breaking or tearing of the pressure release member permits the pressure stored in the container to be released and facilitates the subsequent opening of the container.

After the container pressure has been released, the opening member 20 is moved to a position as shown in FIG. 2, where the aperture 22 substantially overlies the opening tab 18 and the parting edges 27a, 27b are substantially aligned with the scoring 19. Since the scoring 19 in the disclosed embodiment is positioned beneath the end member 17, it will be appreciated that suitable alignment indicia may be printed or otherwise disposed on the end member 17 to assist in the foregoing alignment procedure. Alternatively, it will be understood that no such indicia is needed if scoring is applied to the outside of the end member 17 as discussed previously. With the opening member 20 thus aligned, the opening member is pressed downwardly to place the point 28 into contact with the tip region 30 of the opening tab 18, causing the point 28 to penetrate the scoring 19 at the tip region. This initial penetration of the end member 17, in the case of a container which lacks a pressure release member as defined by the scoring 26 in the disclosed embodiment, causes release of the built-up pressure in the container. The member 20 is then pressed downwardly further to cause the parting edges 27a, 27b to sever or part the opening tab 18 along the scoring 19 thereof.

The opening member 20 includes a tab displacing surface 33 disposed along a length of the underside of the rim 23 in lieu of the parting edge 27a or 27b extending around the remainder of the rim underside. It can be seen from FIGS. 4 and 5 that the parting edge 27a (as well as edge 27b, now shown in that Figure) extends from the point 28 in a somewhat arcuate configuration toward the container attachment end of the opening member, so that the parting edges as applied to the opening tab 18 present points of parting or shearing force travelling from the tip region 30 of the opening tab around both sides of the tab along the scoring 19 toward the bending line 34 of the opening tab. The bending line 34, which is the scored portions 19a, 19b and by the unscored segment 25, is positioned to be beneath and slightly offset toward the rivet 21, relative to

the tab displacing surface 33 on the underside of the opening member 20. As the severing or parting of the opening tab 18 along the scoring 19 is completed, continuing downward pressure applied to the opening member 20 forces the tab displacing surface 33 against the tab 18 to bend the tab along the bending line 34 away from the plane of the end member 17, as seen in FIG. 5. Opening of the container 15 is completed when the opening tab 18 is bent or otherwise displaced a substantial distance downwardly into the container, so that the beverage or other contents of the container can readily be poured or consumed from the container opening 36 provided by the parting and downward displacement of the opening tab 18. The opening member 20 preferably remains in position over the opening 36, since the aperture 22 is suitable for drinking or pouring purposes and since the surrounding rim 23 protects the lips and tongue of the drinker from possible contact with the edge remaining along the scoring 19. The opening member 20 is retained in position over the opening 36 left by the tab 18 through frictional engagement between the downwardly depending side 35 of the parting edge 27 and the adjacent side of the opening 36. The unscored segment 25 retains the tab 18 attached to the end member 17, although the scored portions 19a, 19b may break away during bending of the tab.

Although the self-opening container top as described thus far uses an opening tab 18 wherein the metal-severing operation is partially accomplished by the scoring 19 and is completed by force applied through the parting edges 27a, 27b, the opening tab 18 may alternatively be defined by completing the metal-severing operation along the line 19 and along the portions 19a, 19b during the manufacture of the container end member 17. If such alternative construction is followed, the severed portion of the opening tab 18 in such case must be provided with an appropriate liquid and pressure seal by suitable techniques, such as a sealing tape or substance applied to the underside of the end member 17 to sealingly cover the severed line defining the tab 18. The subsequent opening of the container by downwardly applied pressure to the properly positioned opening member 20 will cause the parting edges 27a, 27b to sever the tape or other sealing substance along the already-severed metal edge.

Although the use of a pressure release member as described above is effective in assisting the container opening procedure by releasing the gaseous pressure within the container before the initial penetration of the scoring 19 by the point of the opening tab, it will be understood that the pressure release member may be omitted from the end member 17. The pressure within the container is then released upon initial penetration of the tab-defining scoring by the opening tab. Of course, substantial pressure will be encountered only in containers which are filled with carbonated beverages or the like, or are purposely pressurized. The scoring 26 which defines the pressure release member may be on either or both sides of the end member 17.

As an alternative to the arrangement of the opening tab 18 located on the end member 17 at a position spaced apart from the recess 31, the scoring 19 can be disposed on the end member within the recess 31 so that the opening tab 18 is defined to be on the bottom of the recess. This alternative arrangement may require some modification of the opening member 20 to re-

locate the parting edges 27a, 27b from the position surrounding the aperture 22 (seen in FIG. 1) to a position surrounding the rim 23 of the opening member. When opening a container constructed according to the present alternative arrangement, the opening member is already disposed with the parting edges 27a, 27b substantially aligned with the scoring defining the opening tab; the opening member 20 is first raised to break the pressure release member (if provided), and is then pressed downwardly to accomplish initial penetration and severing or parting of the opening tab 18 along the scoring 19 thereof.

It will be apparent from the foregoing that the opening member 20 can be affixed on the end member in alignment with the opening tab 18 without disposing the opening tab within the recess 31, such an arrangement, however, may be somewhat more subject to accidental opening of containers, since the opening member 20 is not protected from the application of unwanted forces by being disposed within the recess 31.

Considering next a second embodiment of the present invention as depicted in FIGS. 6 and 7, there is shown an opening member 40 which is modified with respect to the previously-described opening member 20 by the absence of an aperture 22 extending through the portion of the opening member designed to overly and open the tab 18. In place of the aperture 22, the opening member 40 includes a closure 41 which is peripherally surrounded on the underside of the opening member by the parting edges 27a, 27b, including the point 28, and by the tab displacing surface 33. The container-opening operation of the embodiment depicted in FIGS. 6 and 7 is substantially the same as described previously herein; the severing or parting of an opening tab is caused by the point 28 and the parting edges, followed by downward bending of the tab 18 being caused by the tab displacing surface 33. When the opening of the container is completed, the closure 41 is coincidentally received within the container opening 36, and so the just-opened container is closed by the closure 41. As seen in FIG. 7, the closure 41 is disposed within a region 42 recessed below the upper surface or plane of the opening member 40. The recessed region 42 serves the dual functions of providing additional surface features on the opening member 40 to enable this member to be readily grasped for movement from its stored position in a recess 31 to the tab-overlying position, and of disposing the closure 41 within the opening 36 when the opening tab 18 is bent inwardly.

Once the container has been opened with the container top opening member according to FIGS. 6 and 7, the closure 41 can be readily removed from the container opening 36 by lifting the rim 23 upwardly from the end member 17 and by moving the opening member out of alignment with container opening to another location, such as, for example, the recess 31. The container opening 36 is now exposed for pouring or drinking from the container, and it will be understood that the opening member can be returned at will to a position permitting the closure 41 to be again inserted in the container opening for closure purposes.

A third embodiment of the self-opening container top invention is shown in FIGS. 8-12 and eliminates the need for the pivotal attachment provided in the two previously-described embodiments between the container top and the opening member. The container end member 50 is provided with an opening tab 51 defined

by the underside score line 52 with the tab positioned for opening by an opening member 53, all such elements bearing substantial structural and operational resemblance to the corresponding elements previously described herein. However, the end member 50 and the opening member 53 are advantageously formed from a single blank of metal or another suitable material, as shown in FIG. 8, with the score line 52 advantageously formed on either or both sides of the end member 50 by the stamping or blanking operation. The opening member 53 is formed integrally with the end member 50 by a connecting neck 54 having a notch 55 provided at one side thereof for a purpose to be described below. It will be understood that the rolled-under edge 56 surrounding a portion of the rim 57, as well as the parting edges 58a, 58b, the tab displacing surface 59, and the point 60 may be formed on the opening member 53 by metal working operations provided subsequently to the actual stamping or blanking of the integral end member-opening member, such structural elements being depicted in FIG. 8 for illustrative purposes.

Installation of the end member 50 on a container 63, for example, is accomplished by folding the neck 54 over itself to place the opening member 53 more or less parallel with the end member 50. As shown in FIGS. 11 and 12, the neck 54 is folded over the chime 64 of the container 63 when the end member 50 is attached to the container. The opening member 53 preferably is disposed as shown in FIG. 9 to be normally offset from alignment with the opening tab 51, so that any untimely pressure or force applied to the opening member 53 will not press the parting edges 58a, 58b against the score line 52.

When it is desired to open the container top shown in FIGS. 8-12, the opening member 53 is moved from the offset position shown in FIG. 9 to a position as shown in FIG. 10, to align the parting edges 58a, 58b of the opening member 53 with the score line 52 of the end member 50. This movement of the opening member 53 is accomplished by bending the neck portion 65 which extends from the chime 64 toward the rim 57; the notch 55 previously provided in the neck 54 facilitates the bending of the neck required in this repositioning of the opening member. The opening member 53 then is pressed downwardly to cause initial penetration of the end member 50 by the point 60, separation of the opening tab 51 along the score line 52, and then inward bending or displacement of the tab 51 in the manner related above with respect to the first-described embodiment of the present invention. As seen in FIG. 12, the side 66 of the parting edge 58 extends inwardly of the container opening 68 and provides frictional retention of the opening member 53 therein. An aperture 67 disposed within the rim 57 permits the beverage in the now-opened container to be poured or consumed directly from the can.

It will be understood that the foregoing relates only to preferred embodiments of the present invention and that numerous alterations or modifications may be made therein without departing from the spirit and the scope of the invention as defined in the following claims.

What is claimed is:

1. Openable and selectively reclosable container apparatus, comprising:

a container member having a surface and forming a portion of a container which is enclosed for the purpose of containing a product;

a container opening element which is at least partially defined on said container member by a region of predetermined structural weakness relative to the remainder of the container member, said opening element being selectively severable along said region of weakness to become displaced from said surface to provide an opening in said container member;

closure means configured to removably fit into and close said opening in said container opening member; and

said closure means being selectively movably disposed on said container to removably dispose said closure means in closure relation with said opening which is provided in said container member when said opening element is displaced from said surface.

2. Apparatus as in claim 1, wherein said closure means when in said closure relation is disposed over said opening.

3. Apparatus as in claim 1, wherein said closure means comprises a closure configured to fit within and to close said opening, and means peripherally surrounding at least a portion of said closure.

4. Apparatus as in claim 1, wherein said closure means is initially attached to said container member in nonclosure relation with said opening element and is selectively movable for alignment with and closure entry into said opening.

5. Apparatus as in claim 1, wherein:

said closure means comprises a closure configured to fit within and to close said opening; and

means peripherally surrounding at least a portion of said closure to remain outside of said opening while said closure is within said opening.

6. Apparatus as in claim 5, further comprising means movably attaching said closure means to said container member to allow said closure means to be selectively movable onto closure relation over said opening.

7. Apparatus as in claim 1, wherein said closure means comprises a closure member having an external aperture-closing configuration which enters into and substantially closes said opening in said container member when said opening element is displaced, and a rim member surrounding said closure member and remaining outside of said opening when said closure member is disposed in said opening.

8. Apparatus as in claim 7, wherein said closure member is attached to said container member at a first location and is selectively movable to a second location placing said closure member in alignment with said opening.

9. Apparatus as in claim 7, further comprising means on said closure member for engaging the sides of said opening when said aperture closing configuration enters into said opening, so that said closure means is retained in said closure relation.

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