

[54] **EASY-OPENING CONTAINERS**

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[73] Assignee: **SMW Atlanta, Inc.**, Atlanta, Ga.

[22] Filed: **Nov. 2, 1971**

[21] Appl. No.: **194,895**

[52] U.S. Cl. **220/54, 220/90.6**

[51] Int. Cl. **B65d 17/24**

[58] Field of Search **220/53, 54, 47, 48, 27, 90.6; 215/46 A**

[56] **References Cited**

UNITED STATES PATENTS

3,281,024	10/1966	Henchert et al.	220/54 X
3,473,692	10/1969	Moller	220/47

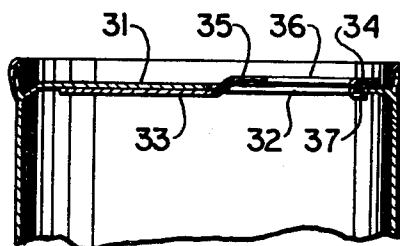
Primary Examiner—George T. Hall
Attorney—Harold D. Jones et al.

[57]

ABSTRACT

Improvements in easy-opening containers of the type frequently referred to as "pop-top" containers used for beverages and other substances. The portion of the easy-opening container which is removed upon opening of the container, and which typically includes a tab of material torn or otherwise removed from the container and a pull ring attached to the tab and having a finger pull therein, is provided with container engagement structure which enables the ring to be secured to the container with the torn-out tab inserted through the opening in the opened container. The finger pull in the ring partially or completely surrounds the opening in the container, thus shielding the sides of the container opening from possible damage to the lips or tongue of a person drinking from the container and also providing a convenient, non-littering technique for disposal of the torn-out portion.

16 Claims, 70 Drawing Figures



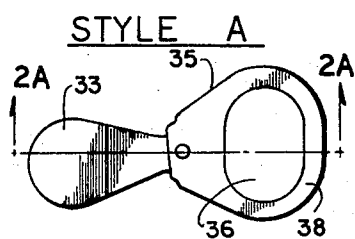


FIG 1A

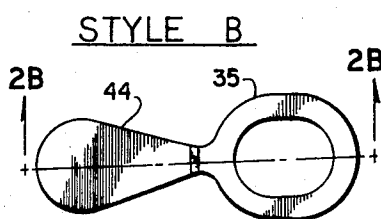


FIG 1B

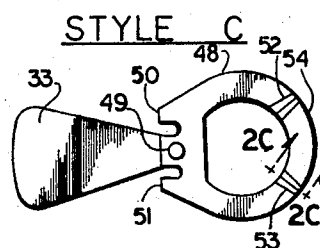


FIG 1C

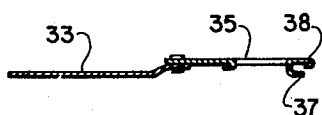


FIG 2A

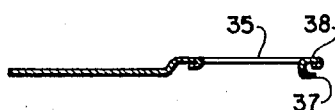


FIG 2B



FIG 2C

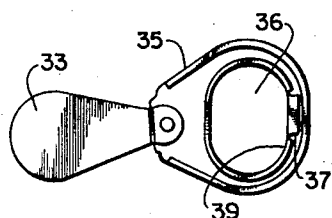


FIG 3A

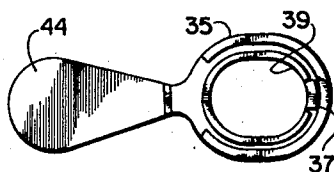


FIG 3B

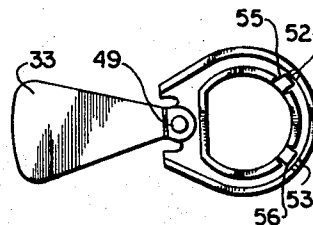


FIG 3C

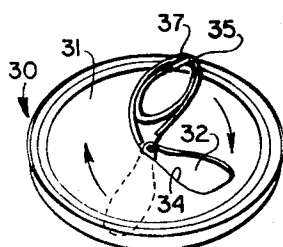


FIG 4A

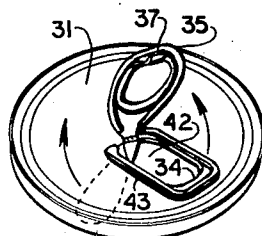


FIG 4B

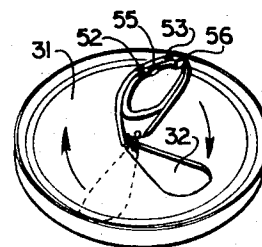


FIG 4C

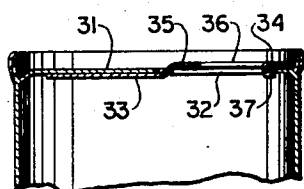


FIG 5

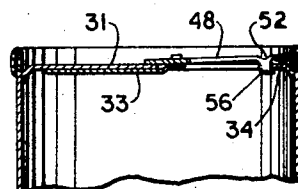


FIG 6

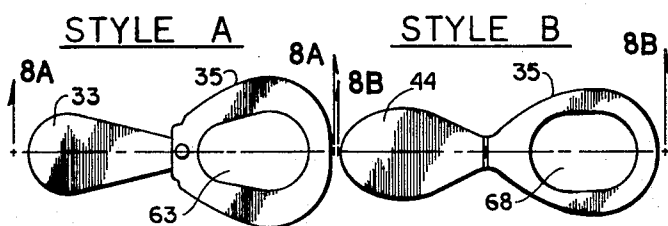


FIG 7A

FIG 7B

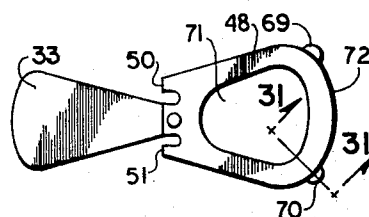


FIG 12

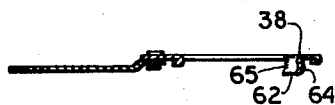


FIG 8A

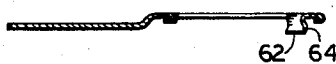


FIG 8B

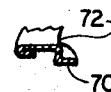


FIG 31

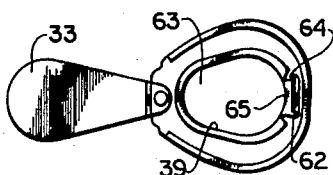


FIG 9A

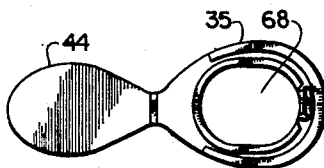


FIG 9B

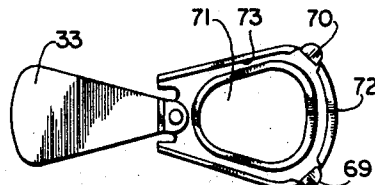


FIG 32

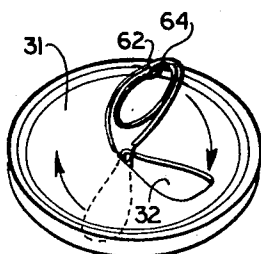


FIG 10A

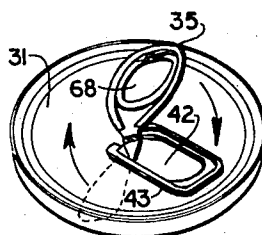


FIG 10B

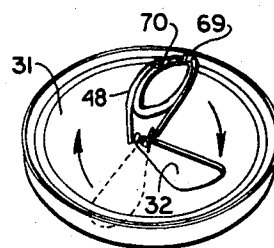


FIG 33

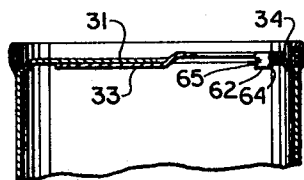


FIG 11

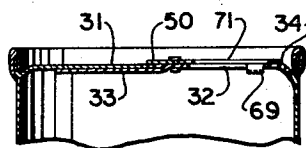


FIG 34

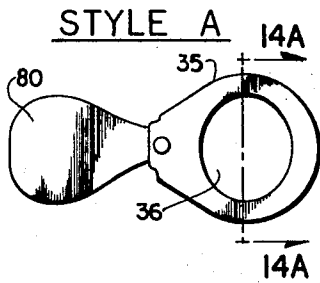


FIG 13A

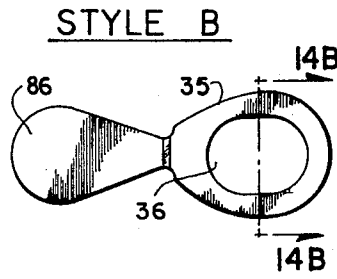


FIG 13B

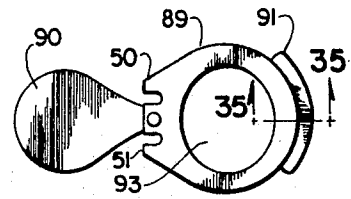


FIG 18

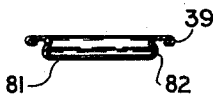


FIG 14A



FIG 14B



FIG 35

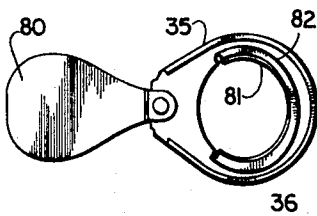


FIG 15A

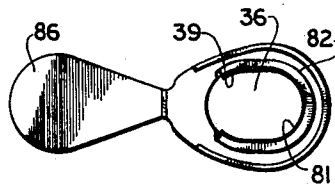


FIG 15B

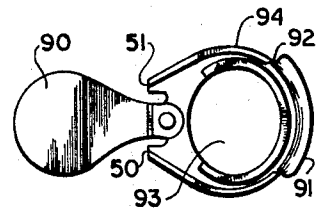


FIG 36

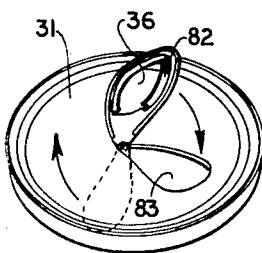


FIG 16A

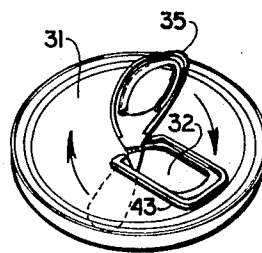


FIG 16B

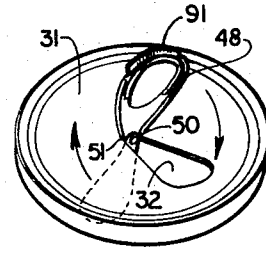


FIG 37

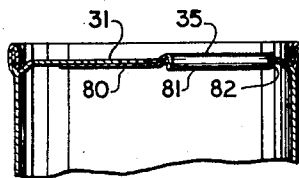


FIG 17

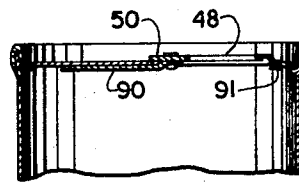


FIG 38

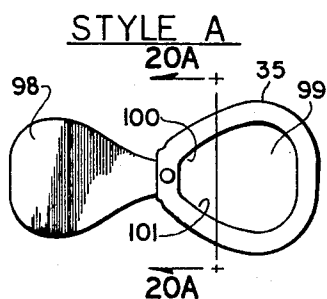


FIG 19A

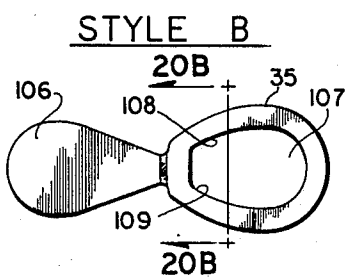


FIG 19B

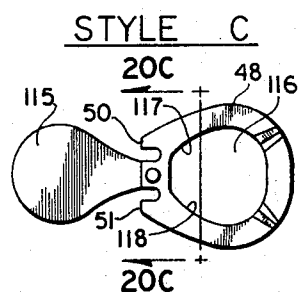


FIG 19C

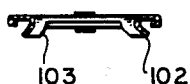


FIG 20A



FIG 20B



FIG 20C

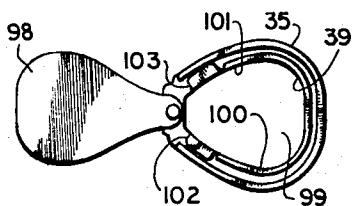


FIG 21A

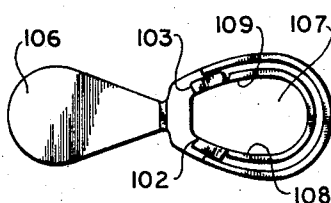


FIG 21B

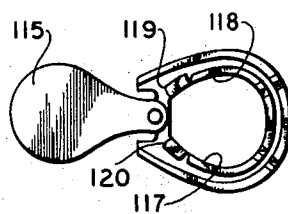


FIG 21C

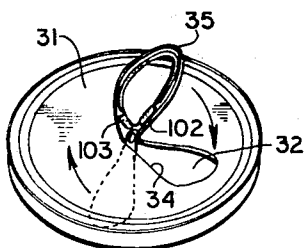


FIG 22A

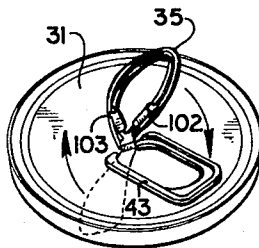


FIG 22B

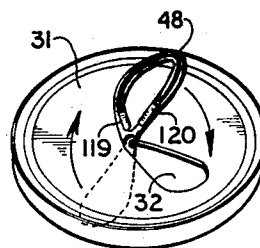


FIG 22C

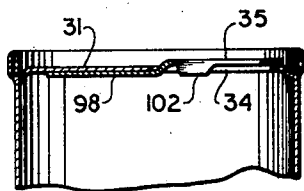


FIG 23

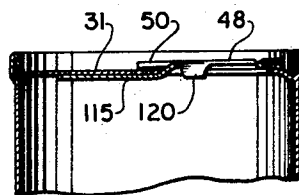


FIG 24

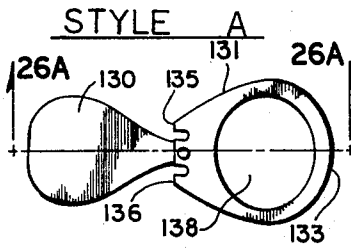


FIG 25A

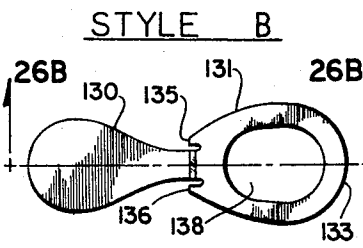


FIG 25B

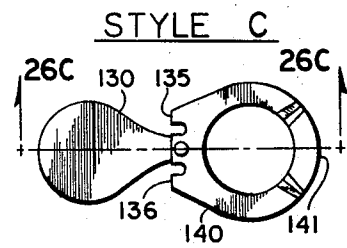


FIG 25C

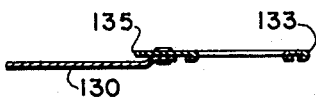


FIG 26A

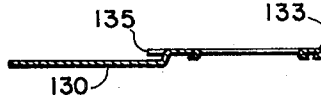


FIG 26B



FIG 26C

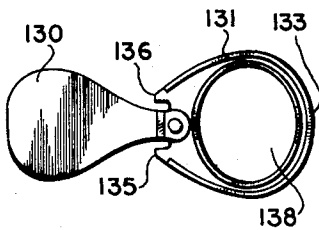


FIG 27A

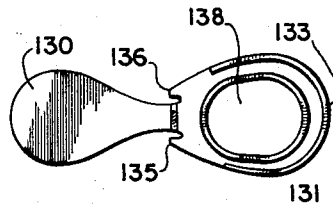


FIG 27B

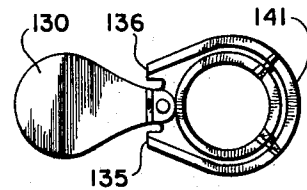


FIG 27C

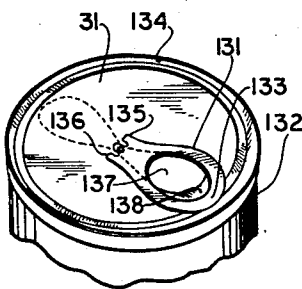


FIG 28A

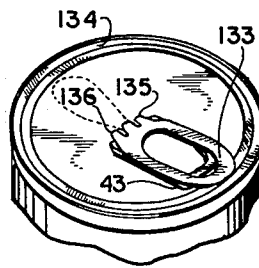


FIG 28B

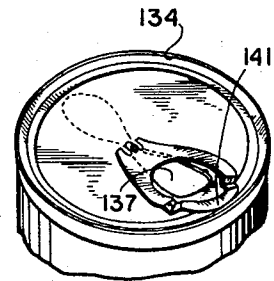


FIG 28C

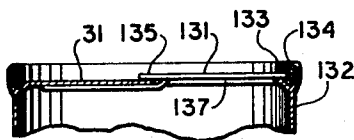


FIG 29

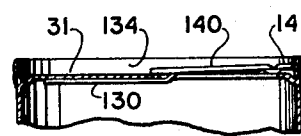


FIG 30

EASY-OPENING CONTAINERS

This invention relates in general to containers and in particular to containers of the easy-opening type.

Containers of the easy-opening or "pop-top" type are well known in the packaging art and have enjoyed widespread acceptance by the packaging industry and by consumers. Such easy-opening containers are especially well received in the beverage industry, where metal containers of beverages such as beer, soft drinks, and the like are made available in cans which can be opened without the need of a separate can opening implement. These easy-opening cans typically include a tear tab defined by embossing, scoring, or otherwise forming a weakened tear line around an outline defining the opening of the container, with this tear line being formed either in an end of the container, for example, or in a separate closure element which is secured over a preformed opening in the container. A ring having a finger opening is secured to the tear tab, and removal of the tear tab can be accomplished by pulling the ring to remove the tear tab by tearing the metal along the tear line. Removal of the tear tab provides an opening or exposes a previously formed opening into the container.

The widespread acceptance of such easy-opening containers has highlighted some problems which are created by these containers. For one thing, the fact that opening of the container is necessarily accomplished by a metal-tearing operation means that the access opening to the container may have rough or sharp edges. Since many easy-opening containers are beverage cans from which the beverage is consumed directly from the can, the existence of such rough edges is hazardous to the lips and the tongue of the user. This hazard is particularly prevalent with youngsters, whose natural inquisitiveness leads them to attempt to stick their tongue into the opening produced by the tear tab. Although progress has been made in easy-opening containers which are designed to minimize the roughness of the opening remaining after the tear tab is removed, the fact that the opening is accomplished by a metal-tearing operation necessarily limits the degree of smoothness which can possibly be obtained with such openings.

The need to dispose of the tear tab and attached ring, following opening of the can, also presents a problem with containers of the easy-opening variety. Unfortunately, it has become common for people to discard the removed tab and ring in a manner producing litter and waste which is visually and aesthetically unattractive, which is difficult to pick up because of its smallness of size and because the articles tend to become ground underfoot, and which is particularly hazardous at beaches or other areas where barefoot people are liable to step on the torn-out tabs. Even persons who would not consider dropping an empty beverage can by the wayside find it easy to dispose of the torn-out tab by dropping it on the ground, for example, a fact which can be easily observed in many camping areas and at facilities where beverage vending machines are located.

Prior art attempts to overcome the litter-causing potential of easy-opening containers generally have included some provision which prevented the tear tab from being completely removable from the container. In U.S. Pat. No. 3,442,416, for example, the scoring is deliberately interrupted at a location in the center of a container end so that the tear tab cannot be completely severed from the metal can end. Proposals of this type have proven impractical, however, since the remaining presence of the tear tab and the ring attached to the top of a beverage can presents an even greater safety hazard to a person attempting to drink directly from the can, and because of the added expense resulting from such proposed extensive modification of existing equipment for manufacturing easy-opening containers.

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

It is another object of the present invention to provide an easy-opening container in which hazardous edges of the opening are shielded from contact.

It is a further object of the present invention to provide an easy-opening container in which the removable opening portion can be disposed in a non-littering manner.

It is yet another object of the present invention to provide an easy-opening container in which the removable opening portion can be affixed to the container after opening.

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

FIGS. 1A, 1B, and 1C are top plan views of three respective styles of a first embodiment of the present invention;

FIGS. 2A, 2B, and 2C are cross section views taken along lines 2A—2A, 2B—2B, and 2C—2C, respectively;

FIGS. 3A, 3B, and 3C are bottom plan views of the respective styles of the first embodiment;

FIGS. 4A, 4B, and 4C show the respective styles of the first embodiment after removal of the tear tab from the container and with the tab partially inserted through the container opening for retention therein;

FIG. 5 is an elevation section view showing style A of the first embodiment as retained in an opened container;

FIG. 6 is an elevation section view showing style C of the first embodiment as retained in an opened container;

FIGS. 7A and 7B are top plan views of a second embodiment of the present invention, showing two of the aforementioned three styles thereof;

FIGS. 8A and 8B are section views taken along respective lines 8A—8A and 8B—8B;

FIGS. 9A and 9B are bottom section views of the aforementioned two styles of the second embodiment;

FIGS. 10A and 10B show the two styles of the second embodiment partially inserted in an open container for retention therein;

FIG. 11 is a vertical section view of style A of the aforementioned second embodiment as retained in an opened container;

FIG. 12 is a top plan view of a sixth embodiment of the present invention;

FIGS. 13A and 13B are top plan views of a third embodiment of the present invention as seen in two of the aforementioned styles;

FIGS. 14A and 14B are section views taken along respective lines 14A—14A and 14B—14B;

FIGS. 15A and 15B are bottom plan views showing the aforementioned third embodiment in two styles thereof;

FIGS. 16A and 16B show the opening member of the aforementioned third embodiment, in two styles thereof, partially disposed to be retained in an opened container;

FIG. 17 is an elevation section view of style A of the third embodiment as fully engaged in an opened container;

FIG. 18 is a top plan view of a seventh embodiment of the present invention;

FIGS. 19A, 19B and 19C are top plan views of a fourth embodiment of the present invention, seen in three styles;

FIGS. 20A, 20B, and 20C are section views taken along respective lines 20A—20A, 20B—20B, and 20C—20C;

FIGS. 21A, 21B, and 21C are bottom plan views of the aforementioned fourth embodiment, in three styles thereof;

FIGS. 22A, 22B, and 22C show the opening member according to the aforementioned fourth embodiment as partially inserted within an opened container for retention therein;

FIGS. 23 and 24 are elevation section views showing the styles A and B, respectively, of the aforementioned fourth embodiment as completely engaged on an opened container;

FIGS. 25A, 25B, and 25C are top plan views of a fifth embodiment of the present invention, seen in three styles;

FIGS. 26A, 26B, and 26C show section views taken along respective lines 26A—26A, 26B—26B, and 26C—26C;

FIGS. 27A, 27B, and 27C, show section views of the aforementioned fifth embodiment of the present invention as engagingly received within an opened can;

FIGS. 28A, 28B, and 28C are bottom plan views of the aforementioned fifth embodiment;

FIGS. 29 and 30 are elevation section views showing styles A and C, respectively, of the fifth embodiment as completely engaged on an opened container;

FIG. 31 is a section view taken along line 31—31 of FIG. 12;

FIG. 32 is a bottom plan view of the sixth embodiment;

FIG. 33 shows the sixth embodiment partially inserted in an opened container;

FIG. 34 is a section view showing the sixth embodiment as retained in an opened container;

FIG. 35 is a section view taken along line 35—35 of FIG. 18;

FIG. 36 is a bottom plan view of the seventh embodiment;

FIG. 37 shows the seventh embodiment partially received in an open container; and

FIG. 38 is a section view showing the seventh embodiment as retained in an opened container.

Stated generally, the present invention includes a tear tab-pull ring arrangement of an easy-opening container including a structural member which enables the tab-ring combination to be retained with the container after the torn-out tab is inserted within the opening of the container and the ring and the opening therein is substantially in alignment with the opening in the container. The several disclosed embodiments of the present invention show that the ring can be provided with structure such as one or more engaging hooks, lock tabs, frictional engagement members, or the like which interact with the edge of the container opening or with another portion of the container to accomplish the aforementioned retention.

FIRST EMBODIMENT

More specifically, and with reference taken to a first embodiment of the present invention as shown in FIGS. 1A—4A and FIG. 5 hereof, there is shown a container indicated generally at 30 and including a top portion 31 having an opening 32 in communication with the interior of the container. The opening 32 in the container has resulted from the tearing removal of a tear tab 33, hereinafter referred to simply as a "tab", which in easy-opening containers of the type identified herein as style A, was formed during the manufacture of the can by providing a tear line around the perimeter 34 of the opening 32 in a manner known to those skilled in the art. The tab 33 is attached to a ring 35 which is provided with an opening 36 generally dimensioned to enable a finger to be inserted therein. The attachment of the ring 35 to the tab 33 can be accomplished by any suitable technique such as welding, riveting, or the like, it being understood that the tab 33 is actually integral with the top portion 31 of the container 30 at the time of manufacture and the ring 35 is a separate member which is attached to the tab, in styles A and C of such easy-opening containers.

The ring 35 is formed to include a container engaging member in the form of a projection 37 which extends downwardly from the underside or bottom of the outer side 38 of the ring. In the depicted embodiment, the projection 37 is formed as an integral part of the rolled-under rim 39 which surrounds at least a portion of the ring opening 36, although it will be understood that the projection 37 may as well be formed by other techniques of manufacturing.

It can be especially seen from FIGS. 2A and 4A that the projection 37 is spaced downwardly from the remainder of the outer side 38 and extends from the perimeter of the opening 36 a distance beneath the outer side 38 to form a member which provides a latching or engaging function, as will become apparent.

Considering the operation of the embodiment as described thus far, it is assumed that a self-opening container as described herein has been opened by the customary expedient of inserting a finger through the ring opening 36 and then pulling the ring 35 backwardly over the length of the tab 33 to remove the tab from the top portion 31 of the container, thus providing the opening 32 in the container. The torn-out tab 33 then is inserted through the container opening 32 to extend within the container, as shown in phantom in FIG. 4A, and the ring 35 then is lowered to the top portion 31 of the container

so that the ring is substantially parallel with the top portion 41, as shown in FIG. 5, with the tab 33 remaining inside the container. The ring 35 next is moved a short distance to the right, as viewed in FIG. 5, so that the projection 37 becomes disposed beneath the confronting portion of the perimeter 34 of the container opening 32. The tab 33 and attached ring 35 thus have become secured in place on the top portion 31 of the container 30, with the ring opening 36 being substantially aligned with the opening 32 in the top portion of the container. The ring 35 in its covering and surrounding configuration respective to the container opening 32 thus serves to prevent or to make difficult any contact between the lips or tongue of a person drinking from the container and the possibly hazardous edge provided by the perimeter 34 which defines the container opening 32. Furthermore, the ring and tab remains with the container and are less likely to be discarded when the container is opened.

Considering next FIGS. 1B—4B, the aforedescribed embodiment of the present invention is shown as applied to an easy-opening container of a type known in the prior art and constructed somewhat differently from the easy-opening container previously described herein. More particularly, and with the same reference numerals being employed to indicate like features in these figures as well as in other figures herein, it can be seen that the top portion 31 of the container is provided in some stage of manufacture with a prepared container opening 42 onto which is mounted a closure consisting of a tear tab seat 43 having a tab 44 outlined therein by embossing or another suitable metal-weakening process to facilitate tearing removal of the tab from the tab seat. A ring 35 is attached to the tab 44, and it can be appreciated that the ring 35 and the tab 44 may be formed as part of a unitary metallic object in the style B, since the tab seat 43, the tab 44, and the ring 35 are manufactured as a component separate from the top portion 31 and are subsequently attached thereto in overlying relation with the container opening 42.

The ring 35 is provided with a downwardly extending projection 37 which may, as previously described, be integrally formed with the rolled-under rim 39. The operation of style B of this first embodiment is essentially as described with respect to FIGS. 1A—4A and FIG. 5, with the tab 44 first being removed by tearing from the tab seat 43 in the conventional manner to expose the interior of the container and with this tab next being inserted through the container opening 42 as shown in FIG. 4B. The ring 35 is then lowered to be substantially parallel with the top portion 41 of the container, and is then moved to dispose the projection 37 beneath the adjacent portion of the can opening perimeter 34. It may be necessary to provide style B with a projection 37, as shown in FIG. 2B, which extends downwardly from the outside 38 of the ring 35 a somewhat greater distance than the corresponding projection 37 of FIG. 2A, inasmuch as the projection of style B must extend beneath not only the thickness of the top portion 31 but also beneath the added thickness of the tab seat 43.

Turning next to style C of the first embodiment of the present invention and in particular to FIGS. 1C—4C and FIG. 6, the tab 33 is removably defined in the top portion 31 of a container by a suitable metal-weakening operation as described with respect to style A previously. The ring 48 is attached to the tab 33 by a suitable technique such as rivet 49. The ring 48 differs from the previously described ring 35 with the inclusion of a pair of finger members 50 and 51 extending from the ring 48 a distance toward the tab 33 and in spaced relation between the fingers and the tab. The ring 48 also includes a pair of lugs 52 and 53 which depend downwardly from the plane of the ring 48 to maintain such ring, as installed on an unopened container, to be disposed in a somewhat elevated position with respect to the container top, thereby to facilitate grasping the ring. The lugs 52 and 53 may be formed by any appropriate technique such as by dimpling or otherwise deforming the side 54 of the ring 48 at two locations thereon. Each of the lugs 52 and 53 has a corresponding projection member 55 and 56, respectively, each of which projections is

analogous to the projection 37 shown on the aforementioned styles A and B of the first embodiment of the present invention.

Style C of the first embodiment functions in a manner substantially similar to that of the aforementioned styles A and B. As particularly shown in FIG. 4C and FIG. 6, the tab 33 is removed from the container top portion 31 in the conventional manner and the tab then is inserted within the container opening 32. The ring 48 is disposed to be parallel with the top portion 41 with fingers 50 and 51 remaining on the exterior of the top portion 31, and is then moved in a direction to cause each of the projections 55 and 56 to become disposed beneath the confronting portions of the container opening perimeter 34, thereby securing the tab and attached ring to the container.

SECOND EMBODIMENT

Turning next to FIGS. 7-11, there is shown a second embodiment of the present invention as applied to easy-opening containers of two styles corresponding to the aforementioned styles A and B. With particular reference to style A as shown in FIGS. 7A-10A and FIG. 11, the second embodiment of the present invention employs a container engaging member 62 which extends downwardly from the interior of the opening 63 adjacent to the side 38 of the ring 35. The container engaging member 62, which may be formed as an extension of the rolled-under rim 39 surrounding the opening 63, extends downwardly from the ring 35 to form a forwardly curved portion 64 extending somewhat beneath the forward side 38; the member 62 terminates at an edge 65 which is displaced rearwardly from the curved portion 64 in a direction toward the tab 33.

Considering the operation of the second embodiment of the present invention, it is again assumed that a container as shown in FIG. 10A, for example, has been opened in the conventional manner. The tab-ring removed from the container by opening is then disposed as shown in FIG. 10A, with the tab inserted through the container opening 32. The ring 35 then is lowered to be substantially parallel with the top portion 31 of the container, whereupon the curved portion 64 of the container engaging member 62 rests on the top portion of the container. A slight downward pressure on the ring 35 causes the container engaging member 62 to be yieldingly deformed sufficiently to permit portion 64 to slip beneath the adjacent portion of the container perimeter 34, as shown in FIG. 11, so that the ring and attached tab are firmly engaged onto the top portion 31 of the container. It can be seen that the curved portion 64 of the container engaging member 62 has resiliently moved forward to be disposed beneath a portion of the perimeter 34 of the container. It will be appreciated, however, that a similar engaging relationship between the ring and the container can be achieved according to the present embodiment with a container engaging member 62 which extends downwardly from the ring 35 for frictional engagement with an adjacent portion of the perimeter 34.

Although the first embodiment of the present invention differed from prior art easy-opening containers only in the inclusion of a structure for locking the ring in place on the container with the ring opening substantially aligned with the container opening, it can be seen from analysis of a conventional easy-opening container tab and ring that the opening remaining in the container following removal of the tab seldom is designed to coincide exactly in size and shape with the opening heretofore provided in the ring for the sole purpose of opening the container. Thus, even though the container opening is surrounded with the ring according to the first embodiment of the present invention, portions of the perimeter 34 defining the container opening 32 may remain exposed to potential contact with the lips or tongue of a person drinking from the container. This problem is overcome according to another feature shown in the second embodiment hereof, wherein the opening 63 in the ring 35 is modified to conform

in shape and size with the tab 33, this feature being best seen in FIGS. 7A and 9A. Accordingly, when the ring has been locked in place on the container as shown in FIG. 11, the ring opening 63 substantially completely coincides with and surrounds the container opening 32. It will be apparent, of course, that the feature of modifying the ring opening to coincide in size and shape with the tab can be applied as well to the first embodiment as discussed above.

Style B of the second embodiment of the present invention, as depicted in FIGS. 7B-10B, is closely similar in configuration and operation to style A of the second embodiment. It can be especially seen from FIG. 8B that the curved portion 64 of the container engaging member 62 extends below the ring 35 a slightly greater distance than as shown in FIG. 8A, so as to accommodate the somewhat greater spacing between the ring and the underside of the container top portion 31, resulting from the intervening presence of the tab seat 43. Again, it can be seen that the size and shape of the opening 68 in the ring 35 of style B has been changed to conform to the size and shape of the tab 44, thus to provide a substantially complete fit of the ring opening 68 over the container opening 42 which was exposed when the container was opened by tearing the tab 44 from the tab seat 43.

THIRD EMBODIMENT

A third embodiment of the present invention is shown in FIGS. 13-16, 17, and 18, with respect to the styles A and B denoted by the corresponding suffixes to the Figure numbers. As seen with respect to FIGS. 13A-16A and FIG. 17, the third embodiment of the present invention provides a container engaging member 81 extending around and disposed below a substantial portion of the interior periphery which defines the opening 36 in the ring 35. This container engaging member 81 has a cross section configuration which is substantially similar to the corresponding configuration of the container engaging member 62 of the second embodiment hereof, as is apparent from a comparison of FIG. 14A with FIG. 8A. Thus, the container engaging member 81 includes a curved portion 82 which is coextensive in periphery with the engaging member 81 and which functions to provide a yielding frictional engagement between the ring 35 and the top portion 31 of a container, as shown in FIG. 17 respecting style A of the third embodiment.

While the extent to which the container engaging member 81 and the curved portion 82 thereof extend around the ring opening 36 has not been found to be critical, the engaging member and curved portion can extend over substantially more than one-half of such periphery as is shown in FIG. 15A, and also in FIG. 15B.

Comparing the size and shape of the tab 80 with the ring opening 36 in FIGS. 13A and 15A, it can be seen that the ring opening 36 is substantially similar to the corresponding ring opening of FIG. 1A and that the size and shape of the tab 80, as previously defined on the top portion 31 of the container by metal weakening to permit tearing removal of the tab, is changed to conform with the ring opening 36. Accordingly, the opening 83 made in the container by removal of the tab 80 therefrom is substantially completely surrounded by the opening 36 in the ring 35 when that ring is disposed in locking engagement over the container top portion, as shown in FIG. 17.

Turning next to style B of the third embodiment, it can be seen from FIGS. 13B-16B that the ring 35 thereof is similarly equipped with a container engaging member 81 which is formed by a downwardly extending extension of the rolled-under rim 39 surrounding the ring 35 and that this container engaging member 81 similarly includes a curved portion 82 which extends around a substantial portion of the periphery of the opening 36. This curved portion 82 thus becomes disposed beneath the top portion 31 of the container when the ring and the tab 86, after being removed by tearing from the tab seat 43, are inserted as shown in FIG. 16B and the ring is subsequently lowered into substantially parallel alignment with the top portion 31 and with the tab seat 43.

It can also be seen with respect to style B of the third embodiment of the present invention, that the size and shape of the tab 86 substantially corresponds to the size and shape of the ring opening 36, thereby insuring that the container opening 32 as well as the overlying opening in the tab seat 43 are completely covered when the ring 35 is locked in place.

FOURTH EMBODIMENT

A fourth embodiment of the present invention is shown in FIGS. 19-22, as represented in styles A, B, and C thereof by the corresponding suffixes to the figures, and in FIGS. 23 and 24. Referring first to FIGS. 19A-22A and FIG. 23, it can be seen that the size and configuration of both the tab 98 and the ring opening 99 have been changed relative to the corresponding shapes shown in FIG. 1A, for example, and it can be additionally seen that the size and shape of the tab 98 and of the ring opening 99 substantially coincide with each other. The ring 35 of the fourth embodiment is configured to define the ring opening 99 by a peripheral surface including regions 100 and 101 which converge toward each other at a location on the ring 35 generally adjacent the region between the ring and the tab 98. The converging portions 100 and 101 are provided with corresponding projections 102 and 103 which extend downwardly from the ring 35 and, in a manner similar to the projection 37 of the first embodiment of the present invention, may be formed as an integral part of the rolled-under rim 39 which surrounds at least a portion of the ring opening 99. It can be seen from FIG. 20A that the projections 102 and 103 extend downwardly from and in spaced relation with the ring 35.

The operation of this fourth embodiment is best understood from FIGS. 22A and 23. Once the tab 98 has been removed from the top portion 31 to provide the container opening 32, the tab 98 is inserted within the container opening and the ring 35 then is moved downwardly to be substantially parallel with the top portion of the container. The ring 35 and attached tab 98 are then displaced to the left, as viewed in FIG. 23, a distance sufficient to cause the projections 102 and 103 to slide beneath the corresponding confronting portions of the perimeter 34 which defines the container opening 32. It is thus seen that the ring 35 is secured to the top portion 31 of the container to place the ring opening 99 in substantial alignment with the correspondingly configured container opening 32.

Style B of the fourth embodiment has a tab 106 of a size and shape corresponding with the ring opening 107, and this ring opening is defined in part by portions 108 and 109 which converge toward each other as shown in FIGS. 19B and 21B. It can be seen that the projections 110 and 111 extend downwardly from the converging portions 108 and 109, and that these projections are spaced apart from the remainder of the ring a sufficient amount to permit engagement of the projections beneath the top portion 31 of an opened container, as seen in FIG. 22B, and also between the interposed tab seat 43.

Turning next to style C of the fourth embodiment, as shown in FIGS. 19C-22C and in FIG. 24, it can be seen that the size and shape of the tab 115 and of the ring opening 116 generally coincide with each other, and that the ring 48 has been provided with inwardly converging portions 117 and 118 having corresponding projections 119 and 120 extending downwardly and spaced apart therefrom. As will be especially apparent from FIG. 24, the ring and tab arrangement of style C is secured by inserting the tab 115 into the opened container and then by lowering the ring 48, with the fingers 50 and 51 disposed on the upper side of the top portion 31, to a generally parallel position with the top portion. The ring then is secured in place by a slight leftward sliding motion, as viewed in FIG. 24.

FIFTH EMBODIMENT

A fifth embodiment of the present invention is shown in FIGS. 25-30, with the several styles of easy-opening containers being identified in the usual manner by suffix to the Figure number. Whereas retention of the tab and ring was ac-

complished in the four previously described embodiments of the present invention with structure which extended downwardly from the ring into either frictional or underlying engagement with one or more portions of the perimeter of the container opening, retention of the ring over the opened container is accomplished according to the fifth embodiment of the present invention by structurally configuring the ring 131 with respect to the container 132 to place the outwardly facing edge 133 of the ring to contact the confronting portion of the container chime or end rim 134, as best seen in FIG. 29, when the tab-ring combination is disposed on the open container. The ring 131 is provided with a pair of fingers 135 and 136 extending in the direction of the tab 130 from the end of the ring opposite the outwardly facing edge 133. As best shown in FIG. 28A and FIG. 29, the fingers 135 and 136 are positioned on the top or upper side of the container top 31 to provide additional support for the ring 131 as disposed in place on the opened container. It will be appreciated that the configuration of the container opening 137, the outwardly facing edge 133 of the ring, and the fingers 135 and 136 are selected to provide a frictional interference fit between the edge 133 and the confronting portion of the container chime 134 so as to retain the ring in place on the container.

It is evident from FIG. 28A that the size and shape of the ring opening 138 is dissimilar to that of the container opening 137. It will be apparent to those skilled in the art that either or both of these openings could be adjusted in size and/or shape to provide the substantial identity of opening configurations as described previously herein, in order that the depicted fifth embodiment of the present invention would likewise afford greater protection for the lips and the tongue of a person drinking a beverage directly from the container 132.

FIGS. 25B-28B show style B of the fifth embodiment including a tab and ring configured to provide retaining engagement between the outwardly facing edge 133 and the confronting portion of the container chime 134. The fingers 135 and 136 as shown in FIG. 28B overlie the tab seat 43 to retain and position the ring thereon.

Similarly, style C of the fifth embodiment hereof includes a ring 140 having an outwardly facing edge 141 configured to be in frictionally engaging confronting contact with a portion of the container chime 134, as shown in FIGS. 28C and 30, when the tab 130 is inserted within the container opening 137 and the ring 140 is lowered to the position shown.

SIXTH EMBODIMENT

A sixth embodiment of the present invention, as shown in FIG. 12 and in FIGS. 31-34, includes the customary tab 33 and a ring 48 having an opening 71 therethrough, the size and shape of the ring opening 71 being configured to be substantially the same as the size and shape of the tab 33. The ring 48 is provided with a pair of tongue members 69 and 70 extending outwardly from locations along the outside edge 72 of the ring. Each of the tongue members 69 and 70 may be formed as an integral portion of the roller-under rim 73 extending around the underside of the outside edge 72. It can be especially seen from FIGS. 31 and 32 that each of the tongue members 69 and 70 extends below the nominal plane of the ring 48 and also extends outwardly a distance beyond the outside edge 72 thereof.

Considering the operation of the sixth embodiment, the tab 33 is removed from the container in the usual manner and is then inserted through the container opening 32 to assume the intermediate position shown in FIG. 33. The ring 48 is then lowered to be substantially parallel with the top portion 41 of the container, with the ring and its attached tab positioned to permit the tongue members 69 and 70 to be received within the container opening 32. The ring 48 is then moved to the right, as viewed in FIG. 34, to cause the tongue members 69 and 70 to be received beneath the top portion 31 of the container. It can be seen from FIG. 34 that the fingers 50 and 51 extend on the outside of the top portion 31. The ring 48 and

the tab 33 connected therewith are thus retained in place on the top of the container with the ring opening 71 being substantially aligned with the container opening 32.

SEVENTH EMBODIMENT

A seventh embodiment of the present invention, as shown in FIG. 18 and FIGS. 35-38, may be considered as a variation of the sixth embodiment described herein. As shown in FIGS. 18 and 36, the seventh embodiment includes a tab 90 connected to a ring 89 having an opening 93 extending therein, with the size and shape of the tab 90 conforming substantially with the size and shape of the ring opening 93. The ring 89 includes a flange 91 extending outwardly from a portion of the outside edge 92 of the ring. The flange 91 may be formed as an integral portion of the rolled-under rim 94 extending along the underside of the outside edge 92, in a manner similar to the formation of the tongue members 69 and 70 used with the sixth embodiment hereof.

It can be seen from FIG. 35 that the flange member 91 extends somewhat below the plane of the ring 89 and extends a distance outwardly of the outside edge 92.

The operation of the seventh embodiment of the present invention, as best seen in FIGS. 37 and 38, requires that the tab be inserted through the opening 32 of the opened container and then that the ring 48 be lowered to a position substantially parallel with the top portion 31, with the flange 91 thus extending through the container opening 32. The ring member then is moved to the right, as seen in FIG. 38, a distance to cause the flange member to be received beneath the confronting edge of the container opening 32, whereupon the ring and tab are secured onto the container top with the ring opening 93 substantially aligned with the container opening 32.

It will be apparent from the foregoing description of several embodiments of the present invention that there are a number of different expedients for accomplishing positioning and retention of the ring on the opened container to provide alignment with the ring opening and the container opening. Referring back to FIG. 3A, for example, the projection 37 could extend around a substantial portion of the perimeter of the ring opening 36, in a manner similar to the configuration of the container engaging member 81 of FIG. 15A. Moreover, the several arrangements of tabs reconfigured to match ring openings, ring openings reconfigured to match tab openings, and reconfigured tabs and ring openings designed anew to match each other, each as previously described with respect to a particular one of the embodiments disclosed herein, is not limited to use with that particular embodiment and can as well be applied to any appropriate embodiment of the present invention.

Moreover, the container engaging structure of embodiments six and seven, for example, should not be considered as limited to the particular tab-ring style depicted therein and is equally applicable to other disclosed or nondisclosed tab-ring styles used on easy-opening containers. Further yet, the container engaging structure of the second and third embodiments, for example, are each usable as well with tab-ring style C as with the styles A and B as disclosed in the corresponding figures.

It will be apparent that the foregoing relates only to certain embodiments of the invention disclosed herein, and that numerous modifications or alterations may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

We claim:

1. A container comprising:
container body means including a surface;
tab means adapted for removal from closure relationship with a portion of said surface to present an opening through said portion of said surface;
means operatively associated with said tab means for applying force to said tab means for accomplishing removal of said tab means from said closure relationship; and

retaining means operatively associated with said force applying means to retain said removed tab means and said force applying means associated therewith on said container body means.

2. The container as in claim 1, wherein:

said retaining means is operative to retain said force applying means in fixed predetermined relation on said surface relative to said opening therethrough.

3. The container as in claim 2, wherein:

said retaining means is disposed on said force applying means to retain said force applying means in fixed predetermined relation on said surface with said removed tab means disposed through said opening and substantially received within said container body.

4. The container as in claim 3, wherein:

said force applying means comprises ring means having an opening therein;

said ring means being connected with said tab means; and

said retaining means being disposed on said ring means to establish retaining engagement between said container body means and said ring means when said ring means is positioned on said surface with said ring means opening in substantial alignment with said surface opening.

5. The container as in claim 4, wherein:

said retaining means comprises means extending from said ring means for retaining relation with said surface when said ring means is positioned proximate said surface with said ring means opening substantially disposed on said surface opening.

6. The container as in claim 5, wherein:

said retaining means extends from said ring means to enter said surface opening for retaining engagement with at least a portion of the surface surrounding said surface opening.

7. The container as in claim 6, wherein:

said retaining means comprises at least one member extending from a ring portion defining said ring opening to a location spaced apart from the plane defined by said ring means for retaining engagement with at least a portion of the surface surrounding said surface opening.

8. The container as in claim 6, wherein:

said retaining means comprises at least one member extending from an outside edge of said ring member to a location spaced apart from the plane defined by said ring means.

9. The container as in claim 4, further comprising:

chime means extending beyond said surface in surrounding relation therewith;

said retaining means comprises means for engagement with said chime means when said ring means is positioned proximate said surface with said ring means opening substantially disposed on said surface opening.

10. The container as in claim 4, wherein:

said tab means and said opening in said ring means have substantially the same size and shape.

11. A container of the type comprising:

a container body portion and a normally closed end portion; tab means removed from normal closure relationship with said end portion to present an opening through said end portion into said container body portion;

ring means attached to said tab means, said ring means having an opening therein;

said tab means extending through said end portion opening to be disposed within said container body portion;

said ring means being in predetermined position on said end portion with said ring means opening in substantial alignment with said end portion opening; and

means on said ring means operative to retain said ring means in said predetermined position.

12. The container as in claim 11, wherein:

said last-mentioned means extends from said ring means into retaining engagement with at least a portion of said end portion surrounding said end portion opening.

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13. In a container of the type including a surface, a tab adapted for removal from closure relation with a defined portion of such surface to present an opening into the container, and a ring member attached to said tab, the improvement comprising:

means on said ring member to retainingly engage said ring member in alignment with said opening.

14. A ring member for use in conjunction with a container of the type including a surface, a tear tab adapted for removal from closure relationship with a portion of such surface to present an opening of said container, the ring member having a closed peripheral portion defining an opening in the ring member, comprising:

means on said ring member disposed for retaining engage-

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ment with said container to retain said ring member on said surface with said ring opening in alignment with said container opening.

15. The invention as in claim 14, wherein:

said means on said ring member comprises means extending from said peripheral portion for engagement with at least a portion of the periphery of said container opening.

16. The invention as in claim 15, wherein:

said engagement means extends from said peripheral portion to be received within said container opening in engagement with at least a portion of said periphery of the container opening.

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