PROTECTIVE ARRANGEMENT IN AN EASY-OPENING CONTAINER
1 Claim, 6 Drawing Figs.

ABSTRACT: A container having a tubular body and a pair of end members, at least one of the end members being formed of metal and having a peripheral portion and a removable central panel portion with a pull tab mounted thereon, the end member being formed with a single line of weakness on the inner surface thereof at the juncture of the peripheral and the central panel portions and immediately adjacent the tubular wall of container so that, when the central panel portion is removed by operation of the pull tab, no protrusion of metal will extend inwardly from the inner surface of the body a distance substantially greater than the thickness of the metal in the peripheral portion. The single line of weakness in the inner surface of the end member is formed by placing the end member against a stationary support member having a cutting element and forcing the end member against the cutting element by operation of a movable compression member.
3,543,961

PROTECTIVE ARRANGEMENT IN AN EASY-OPENING CONTAINER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a container of the easy-opening type having a tubular body formed of fibreboard or metal and a pair of end members, at least one of which is formed of metal and having a pull tab mounted thereon for easy-opening of the container and, more particularly, to a container of the type described having an arrangement for protecting the user's hand when inserted into the opened container.

2. Description of the Prior Art

In the present day packaging industry there is a growing trend to produce containers of the easy-opening type whereby the central panel portion of an end member, or end wall, may be readily detached and removed from the remaining portion without using separate container opening equipment. A problem which has arisen in connection with containers having this feature relates to the danger of cuts and abrasions to the user who may insert his hand into the container after it has been opened. It is likely that the user's hand will be cut because of its contact with a free, raw protrusion of metal extending from the remaining portion of the end wall into the opening created by removal of the central panel portion.

Various means have been experimented with by the packaging industry to overcome this problem, such means included various separate shielding devices incorporated into the container to shield the metal protrusions from the user's hands. Since in many of these protective devices separate parts were necessary, the cost of manufacture and assembly of a completed container has become uneconomical.

SUMMARY OF THE INVENTION

The present invention overcomes the disadvantages of known protective devices and provides an arrangement in an easy-opening container for protecting the user's hand when the same is inserted into an opened container. Generally, a single line of weakness is formed on the inner surface of an end member of a container extending partially into the member. This line of weakness is formed by placing the end member against a stationary support having a cutting element and then forcing the end member against the cutting element by operation of a movable compression member. The end member has a peripheral portion and a removable central panel portion, the line of weakness being formed on the inner surface of the end member at the juncture of the peripheral portion with the central panel portion and immediately adjacent the wall of the container so that, when the central panel portion is removed, no protrusion of metal will extend inwardly from the container wall a distance substantially greater than the thickness of the metal in the peripheral portion.

DRAWING

FIG. 1 is a top plan view of a container embodying the present invention;

FIG. 2 is a perspective view of the container illustrated in FIG. 1 and showing the central panel portion removed from the container;

FIG. 3 is a sectional view, on an enlarged scale, taken generally along the line 3-3 of FIG. 1;

FIG. 4 is a sectional view, on an enlarged scale, of a portion of the container before removal of the central panel portion of the end member;

FIG. 5 is a sectional view, on an enlarged scale, of a portion of the container shown in FIG. 4, but after removal of the central panel portion of the end member; and

FIG. 6 is a schematic view of a portion of the apparatus used to form the line of weakness in the container shown in FIG. 1.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawing and will herein be described in detail, an embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

Referring now to the drawing for a better understanding of the invention, it will be seen that a container, embodying the present invention, is generally designated 10 and has a tubular body 12 which may be formed of either paperboard or metal. The tubular body is closed by a pair of end members 14 secured to the ends thereof by means well known in the art. The end members are normally formed of metal, such as steel or aluminum.

As best seen in FIGS. 1—3, one of the end members 14 (only the upper end member being shown in the drawing) has a peripheral portion 16 which is secured to the top edge of the body 12 by conventional means. A removable central panel portion 18 is integrally formed with the peripheral portion 16 and detachably joined to the inner edge thereof along an uninterrupted single line of weakness 20 formed on the inner surface of the end member 14. It will be observed, from FIGS. 3—5, that the line of weakness 20 is located immediately adjacent the inner surface of the body 12 for the purposes to be explained in detail later.

The removable central panel portion 18 has a pull tab 22 mounted thereon by a rivet 24 formed from material of the removable central panel portion 18 by means well known in the packaging industry.

As best seen in FIGS. 1 and 3, a nose 26 of the pull tab 22 is positioned in an overlying relationship to the line of weakness 20, while a ring segment 28 of the pull tab extends toward the center of the removable panel portion.

In opening the container, the user inserts his finger through the ring segment 28 and by exerting a slight lift on the ring segment causes the nose 26 of the pull tab 22 to break the metal remaining above the line of weakness 20. A further pulling of the tab 22 will cause breakage of metal above the line of weakness so that the entire panel portion 18 may be removed, as illustrated in FIG. 2.

Referring now to FIG. 6, there is shown a portion of an apparatus, generally designated 30, the apparatus being used in the formation of the line of weakness 20 in the end member 14. The apparatus 30 includes a stationary support member 32 which has a cutting element 34 formed in the top surface thereof. The support member receives the end member 14 in such a manner that the point of the end member representing the juncture between the peripheral portion 16 and the removable central panel portion 18 is located directly against the cutting element 34. A compression member 36 is positioned above the support member 32 and is movable in a vertical direction so that, when it is moved in a downward direction, will sandwich the end member 14 between the compression member 36 and the support member 32. This operation will cause the cutting element 34 to be forced into the end member 14 whereby a cut will be made into the end member 14 representing the line of weakness 20.

Referring now to FIG. 5, it can be observed that by having the line of weakness 20 positioned at the juncture of the peripheral portion 16 with the central panel portion 18 and immediately adjacent the inner surface of the body 12, the removal of the central panel portion 18 will not produce a protrusion of metal extending inwardly from the peripheral portion 16. Thus, the size of the opening will approximate the diameter or cross section of the body 12 less the thickness of metal in the peripheral portion 16. Therefore, a user, desiring to insert his hand into the opened container, will not be subjected to cuts and abrasions normally associated with easy-opening containers.

The formation of the line of weakness on the inner surface of the end member 14 by operation of apparatus 30 facilitates easy rupture of metal and removal of the central panel portion since the metal tears easiest in the direction in which it was scored or weakened. Weakening of the inner surface of the
end member 14 by operation of apparatus 30 eliminates microfractured metal at the bottom of the weakened area due to weakening being formed while the metal is under compression provided by the compression member 36. The compression in the metal tends to hold the metal fibre structure together and avoid fractures causing minute metal particles which may mix with the product, packaged in the container to make the product unusable. We claim:

1. In a protective arrangement for a container of the easy-opening type having a tubular body, a pair of end members secured to the opposite ends of said body, at least one of said end members being formed of metal and comprising:
   a. a peripheral portion secured to an end edge of said body;
   b. a removable central panel portion detachably joined to said peripheral portion along an uninterrupted single line of weakness;
   c. said central panel portion having a pull tab mounted thereon with the tip of said tab substantially overlying and being in alinement with said line of weakness for rupturing said panel at said line of weakness;
   d. said single line of weakness being located on an inner surface of said end member at a juncture of said central panel portion with said peripheral portion and immediately adjacent an inner surface of said body to facilitate removal of said central panel portion by operation of said pull tab for opening said container;
   e. the operation of said pull tab causing said central panel portion to be characterized in that said operation causes all remanent portions of said end member being in said peripheral portion and extending downward.