June 3, 1969 F. J. STEC 3,447,713

SCORE SHIELD AND ANTI-IMPLOSION RING

Filed Nov. 3, 1967

FIG. 1

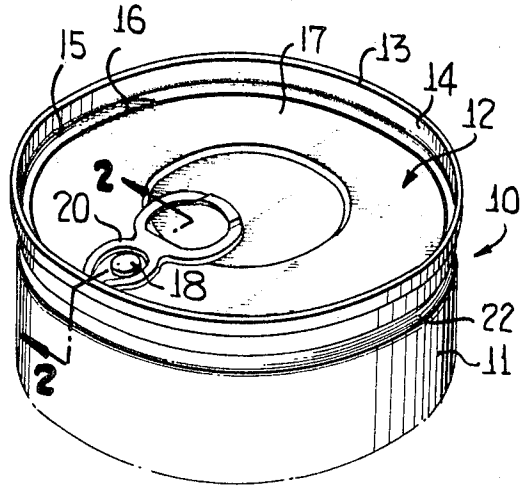


FIG. 2

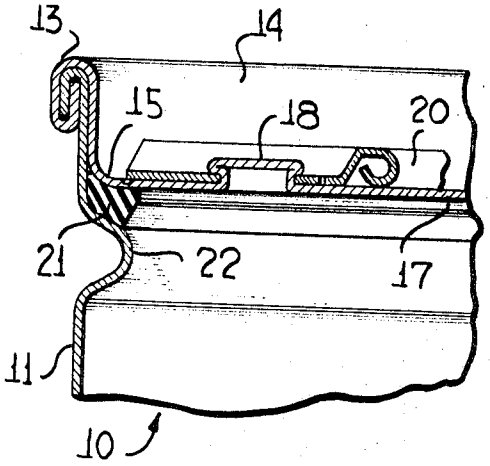


FIG. 3

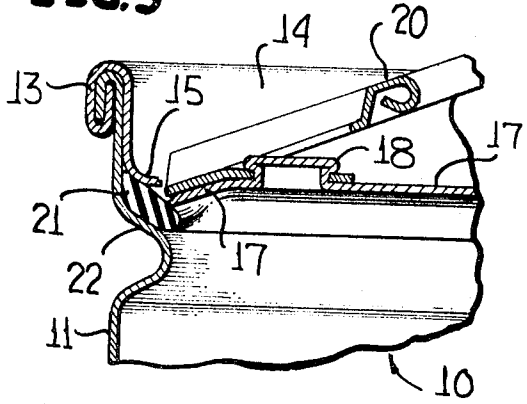


FIG. 5

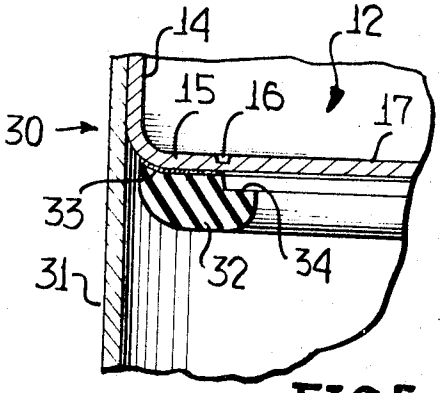
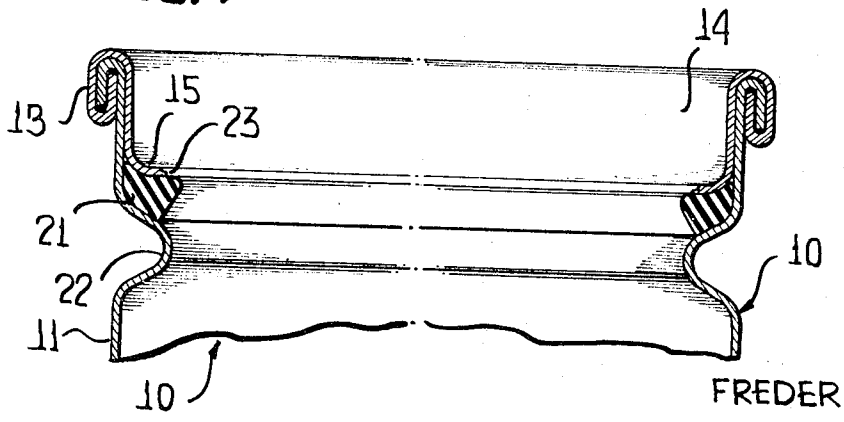


FIG. 4



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United States Patent Office 3,447,713 Patented June 3, 1969

3,447,713

SCORE SHIELD AND ANTI-IMPLOSION RING

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Filed Nov. 3, 1967, Ser. No. 680,472
Int. Cl. B65d 17/20
U.S. Cl. 220—54 9 Claims

ABSTRACT OF THE DISCLOSURE

This disclosure relates to an easy opening container of the type wherein one end has substantially the entire end panel thereof removable during the opening thereof. The end panel is reinforced by a pliable ring which is positioned in underlying relation to the end panel and projecting into the removable panel portion so as to both reinforce the end panel along the score line thereof and to prevent implosion during opening when the pressure within the container is less than atmospheric.

This invention relates in general to new and useful improvements in easy opening containers, and more particularly to a container of the easy opening full opening type.

A primary feature of this invention is to provide a ring which is positioned within the container in underlying relation to the end panel of an easy opening end thereof with the ring engaging the end panel in direct underlying relation to the score line thereof so as to reinforce the end panel at the score line and prevent accidental rupture thereof along the score line.

Another feature of the invention is that the ring is formed of a pliable material and while it underlies the removable panel portion, the resistance thereof to deflection of the removable panel portion into the interior of the container is not sufficient to prevent the movement of the removable panel portion into the interior of the container during the normal opening thereof.

Another object of this invention is to provide an easy opening container with a pliable ring which directly underlies the end panel of the container end and which supports the end panel in underlying relation to the normal score line which defines a removable panel portion, the ring serving both to prevent accidental rupture of the end panel along the score line and the uncontrolled movement of the removable panel portion into the container due to the pressure within the container being less than atmospheric pressure.

A further feature of the invention is the shaping of the pliable ring so as to be seated within the container at the intersection of the end panel wtih the body wall and with the body wall being provided with a bead for the purpose of locating the ring.

A still further feature of the invention is that the ring may be adhesively bonded to the underside of the end panel.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings:

FIGURE 1 is a fragmentary top perspective view of a can formed in accordance with this invention.

FIGURE 2 is an enlarged fragmentary vertical sectional view taken along the line 2—2 of FIGURE 1 and shows the specific details of one form of the invention.

FIGURE 3 is a fragmentary sectional view similar to FIGURE 2 and shows the relationship of the pliable ring relative to the removable panel portion during the initial opening of the can.

FIGURE 4 is a transverse vertical sectional view through the upper portion of the can of FIGURE 1 and shows the same with the removable panel portion removed.

FIGURE 5 is a fragmentary vertical sectional view showing a modified form of ring construction.

Referring now to the drawing in detail, it will be seen that there is illustrated in FIGURE 1 a container or can **10**. The can **10** includes a body **11** of which only the upper portion is illustrated. The lower portion of the body **11** is closed in the conventional manner. The upper end of the body **11** is closed by means of an easy opening end, which is generally referred to by the numeral **12**, and which is secured to the body **11** by means of a conventional double seam **13**.

The end **12** includes the usual chuck wall **14** and end panel **15**. The end **12** is of a conventional full opening type and the end panel **15** thereof is provided with a peripheral score line **16** defining a removable panel portion **17** which constitutes a major portion of the end panel **15**.

In order to facilitate the initial rupture of the end panel **15**, the removable panel portion **17** is provided with an integral rivet **18** by means of which a pull tab **20** is secured thereto. The pull tab **20** is utilized to initially place a downwardly or inwardly directed force on the removable panel portion **17** along a starting portion of the score line **16** sufficient to effect the initial rupture of the end panel. A further movement of the pull tab **20** will result in a folding or bending of a part of the removable panel portion **17** down into the interior of the can. After this occurs, an upwardly or outwardly directed pull on the pull tab **20** will result in the complete tearing out of the removable panel portion **17**.

The can **10**, as described above, has several deficiencies. In the first place, because the end panel **15** is weakened by the provision of the score line **16**, there is always the possibility of accidental rupture of the end panel along the score line. Secondly, when a product is vacuum packed within the can **10**, due to the differential in pressure between the interior of the can and the exterior thereof, there is a danger of implosion immediately after the initial rupture of the end panel. A further disadvantage of the can is the existence of the raw edge resulting from the tearing out of the removable panel portion **17**.

In accordance with this invention, the three enumerated disadvantages may be overcome by the simple provision of a pliable or resilient ring **21**. The ring **21** which is generally triangular in section, is positioned within the body **11** at the intersection between the body **11** and the end panel **15**. In order to facilitate the positioning of the ring **21** within the can **10**, the upper portion of the body **11** is provided with a radially inwardly directed bead **22** which is spaced axially from the end panel **15**. The bead **22** is so related to the dimensions of the ring **21** and to the end panel **15** so as to provide for a clamping of the ring **21** between the end panel and the bead. At the same time, it is to be noted that the ring **21** is of a dimension to project radially inwardly of the score line **16** a slight distance. At this time, it is pointed out that the bead **22** also serves to facilitate the initial positioning of the ring **21**. The ring **21** may be placed within the body **11** prior to the closing thereof by the application of the end **12**.

It will be readily apparent from FIGURE 2 that the ring **21** provides a support for the end panel **15** in the vicinity of the score line **16**, thereby reinforcing the end panel **15** against accidental fracture along the score line **16**. On the other hand, the ring **21** is sufficiently pliable so as to deflect downwardly, as is shown in FIGURE 3, during the opening of the can **10**.

It is to be understood that when the pull tab **20** is lifted to effect the initial rupture of the end panel **15** along the score line **16**, the ring **21** will resist the inward movement of the removable panel portion **17**. This resistance will be sufficient to prevent the undesired implosion which frequently occurs due to a differential in pressure between the atmosphere and the interior of the can **10** when the can **10** is a vacuum packed can. However, the ring **21** will be sufficiently pliable to permit the inward bending or folding of the removable panel portion **17** utilizing the pull tab **20** to provide for a sufficient initial rupture of the end panel to provide for a tearing out of the removable panel portion **17** by a later applied outwardly directed pull on the pull tab **20**.

Referring now to FIGURE 4, it will be seen that after the removable panel portion **17** has been torn from the end panel **15** and the can **10** has been fully opened, the ring **21** has returned to its original position. At this time it functions as a guard against accidental contact with a raw edge **23** which now exists around the inner periphery of the end panel **15**. However, the ring **21** does not project radially inwardly sufficiently to unduly obstruct the removal of a product from the can **10**.

It is to be understood that the ring **21** may be formed of an attractive material, such as plastic, or a rubber-type material which will in no way detract from the appearance of the can and the product packaged therein. Also, because the ring **21** remains clamped between the end panel **15** and the bead **22**, there is no possibility of the bead being accidentally removed with the product. If desired, a suitable adhesive (not shown) may be applied to the ring **21** to bond the ring to the body **11** or the end panel **15** or both.

In FIGURE 5 there is illustrated a slightly modified form of can construction, which can is generally referred to by the numeral **30**. The can **30** includes a body **31** of a conventional type, which body has the upper end thereof closed by means of the easy opening end **12**. It is to be noted that the body **31** is cylindrical as opposed to being provided with a bead, such as the bead **22**. Accordingly, it is not feasible to apply a ring, such as the ring **21**. Accordingly, the can **30** is provided with a modified form of ring which is identified by the numeral **32**. The ring **32** is directly bonded to the underside of the end panel **15** by means of a suitable adhesive **33**.

It is to be noted that the ring **32**, while it does directly engage the end panel **15** beneath the score line **16** does not directly engage the removable panel portion **17**. Instead, the ring **32** is notched as at **34** to permit a slight downward or inward movement of the removable panel portion **17** before it contacts the ring **32**. The axial inward movement of the removable panel portion **17** will only be sufficient to permit the formation of an opening in the end panel **15** of a size to permit the venting of the can **30**. Thus, the ring **32** will prevent any possibility of implosion.

It is to be understood that the ring **32** is also formed of a sufficiently pliable and resilient material so as to be deflectable under a pressure applied by the pull tab **20** so as to permit sufficient inward bending or folding of the removable panel portion **17** to release a starting portion thereof whereby further rupture of the end panel **15** and the tearing out of the removable panel portion **17** may be effected.

It is also to be noted that the ring **32**, like the ring **21**, remains in place after the tearing out of the removable panel portion **17** and functions as a guard for the resultant raw edge.

It will be readily apparent that the configuration of the ring may be varied from the two embodiments specifically illustrated and described herein. Accordingly, no attempt has been made to illustrate all possible embodiments. Therefore, it is to be understood that minor variations may be made in the details of the ring and its relationship to the remainder of the can without departing from the spirit and scope of the invention, as defined in the appended claims.

I claim:

1. An easy opening container including an end having an end panel, a weakening line in said end panel defining a removable panel portion, and a shield engaging said end panel along at least a starting portion of said weakening line and protecting said weakening line, said shield being secured to said container solely outwardly of said removable panel portion with a free portion of said shield overlapping said removable panel portion.

2. The container of claim **1** wherein said shield is in the path of initial opening movement of said removable panel portion, said shield being formed of resilient material and being deflectable by said removable panel portion.

3. The container of claim **1** wherein said shield extends entirely around said removable panel portion.

4. The container of claim **1** wherein said shield is bonded directly to said end panel.

5. The container of claim **1** wherein the portion of said shield overlapping said removable panel portion is spaced from said removable panel portion.

6. The container of claim **1** wherein said removable panel portion constitutes a major portion of said end panel and said shield is in the form of a ring.

7. An easy opening container including an end having an end panel, a weakening line in said end panel defining a removable panel portion, and a shield engaging said end panel along at least a starting portion of said weakening line and protecting said weakening line, there being a corner between said end panel and a body of said container, and said shield being in the form of a ring seated in said corner.

8. The container of claim **7** wherein said body has a radially inwardly directed bead adjacent said end panel, and said shield engages said head and is positioned thereby.

9. The container of claim **7** wherein said body has a radially inwardly directed bead adjacent said end panel, and said shield engages said bead and is positioned thereby, said bead being triangular in section.

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U.S. Cl. X.R.

220—48