Sept. 10, 1968 N. S. KHOURY 3,400,852

PROTECTION BEAD FOR EASY-OPENING CAN ENDS

Filed Feb. 7, 1966

FIG. 1

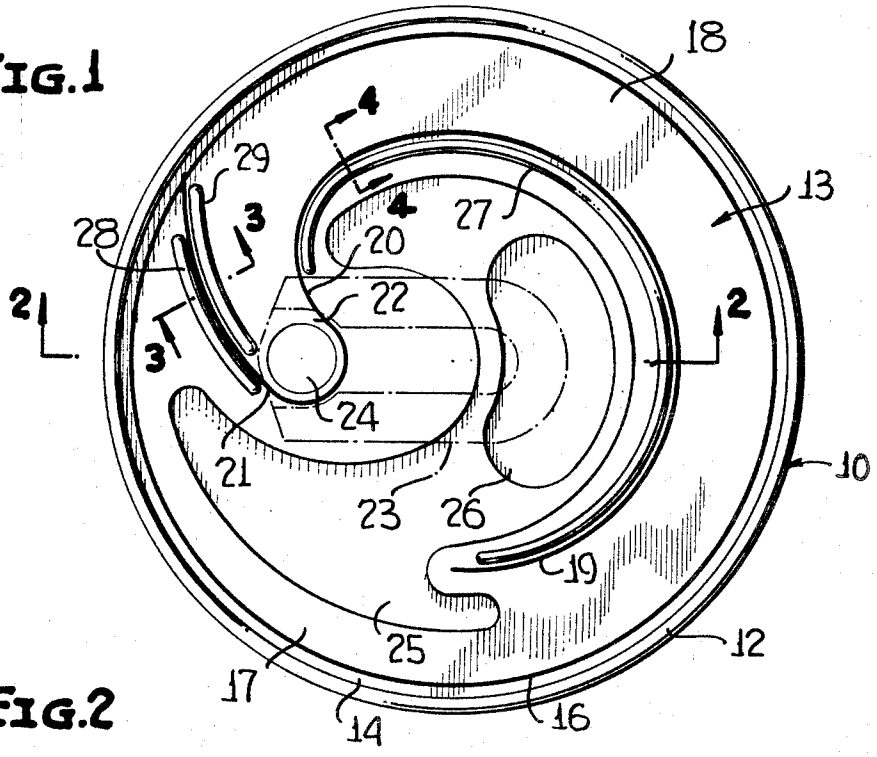


FIG. 2

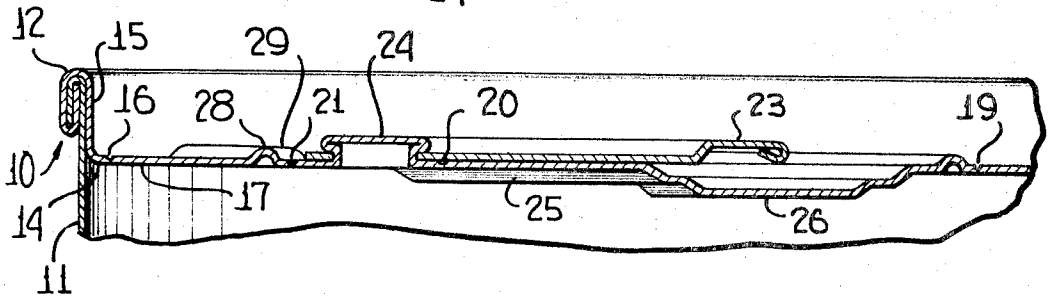


FIG. 3

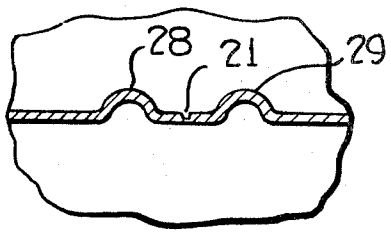
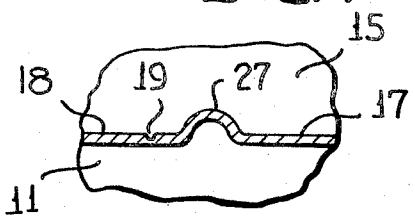


FIG. 4



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United States Patent Office 3,400,852 Patented Sept. 10, 1968

3,400,852

PROTECTION BEAD FOR EASY-OPENING CAN ENDS

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Filed Feb. 7, 1966, Ser. No. 525,511
10 Claims. (Cl. 220—54)

ABSTRACT OF THE DISCLOSURE

This disclosure specifically relates to an easy-opening can end of the type having a tear strip and particularly has to do with the provision of a bead arrangement disposed immediately adjacent certain of the score lines of the can end, which bead arrangement not only protects the score line, but which will also combine the tearings of the end panel of the can end along that score line so that the tearing will definitely continue in the intended manner.

This invention relates in general to new and useful improvements in easy-opening can ends and more particularly to can ends of the type which have score lines formed in the end panels thereof to facilitate the tearing away of portions of the end panels.

This invention particularly relates to full opening can ends wherein substantially the entire end panel is torn therefrom. Such can ends have a peripheral score line, which is protected by the upstanding chuck wall of the can end and inner score lines defining a tear strip which facilitates the complete tearing out of the end panel along the peripheral score lines. The starting end of the tear strip is protected by the usual pull tab attached thereto. However, a major portion of the inner score lines is left unprotected and the can end is subject to rupture due to accidental contact of the end panel with various objects.

In view of the foregoing, it is the primary object of this invention to provide a novel easy-opening can end wherein the various score lines which are normally unprotected are now protected by means of upwardly projecting beads disposed immediately adjacent the score lines.

Another object of this invention is to provide in a full opening easy-opening can end of the type having a tear strip with an inwardly directed starting end, a bead arrangement which will not only protect the score line defining the outer part of the tear strip starting end, but which will also confine the tearing of the end panel of the can end along the score line so that the tearing will definitely continue into a peripheral score line in the intended manner.

A further object of this invention is to provide an easy opening can end of the type having removable portions defined by score lines, a bead arrangement which will protect the can end in the vicity of the score lines, the bead arrangement being upstanding ones capable of absorbing impact energy which would otherwise fracture the can end along the score lines.

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 drawing.

In the drawing:

FIGURE 1 is a plan view of a can incorporating a can end formed in accordance with this invention, the pull tab of the can end being shown in phantom lines for purposes of clarity.

FIGURE 2 is an enlarged fragmentary vertical sectional view taken along the line 2—2 of FIGURE 1 and shows further the details of the can end.

FIGURE 3 is an enlarged fragmentary vertical sectional view taken along the line 3—3 of FIGURE 1 and shows more specifically a protector bead arrangement.

FIGURE 4 is an enlarged fragmentary vertical sectional view along the line 4—4 of FIGURE 1 and shows another protector bead arrangement.

Referring now to the drawing in detail, it will be seen that there is illustrated a can of the easy-opening type, which can is generally referred to by the numeral **10**. The can **10** includes a conventional can body **11** to which there is secured by means of a conventional double seam **12** an easy opening can end which is generally referred to by the numeral **13**.

The easy-opening can end **13** is formed of an end panel **14** which is defined by an upstanding chuck wall **15**, the chuck wall **15** being part of the double seam **12**. The can end **13** is of the full opening type and has a peripheral score line **16** disposed closely adjacent the chuck wall **15**, the score line **16** defining a removable panel portion **17**.

In order to facilitate the tearing of the end panel **14** along the peripheral score line **16**, the removable panel portion **17** has incorporated therein a tear strip **18**. The tear strip **18** has as its outer boundary for the most part the peripheral score line **16**. A major portion of the tear strip **18** is defined along its inner edge by a score line **19**. For the most part, the score line **19** is disposed in cooperating relation to the peripheral score line **16**. However, the score line **19** has a starting portion **20** which is generally inwardly directed. A third score line **21** cooperates with the score line portion **20** to define a starting end **22** of the tear strip **18**.

In order to facilitate the tearing out of the removable panel portion **17**, the starting end **22** of the tear strip **18** has secured thereto a pull tab **23**. The pull tab **23** is illustrated as being secured to the tear strip starting end **22** by means of a rivet **24** integrally formed with the end portion **22**.

It is to be noted that the removable panel portion **17** is provided with a panel configuration **25** to stiffen the end panel **14** against flexure and also to make certain the tearing of the end panel along the score line **19** terminates within the removable panel portion **17**. The end panel **14** is further recessly paneled at **26** to facilitate the lifting of the pull tab **23** when it is desired to open the can **10**.

It will be readily apparent from FIGURE 1 that in a can end of the foregoing construction, the peripheral score line **16** is protected by the chuck wall **15** due to the proximity thereof to the chuck wall. Also, the score line portions around the extreme free end of the starting end **22** of the tear strip are protected by the pull tab **23**. On the other hand, it will be seen that substantially all of the score lines **19** and **21** are protected and thus the can end **13** is less subject to rupture by impact engagement thereof with another object. This invention particularly relates to the provision of protector beads for the score lines **19** and **21**.

It is to be noted that the removable panel portion **17** is provided with an elongated bead **27** which is disposed closely adjacent the score line **19**. The bead **27** extends from a point immediately adjacent the pull tab **23** to substantially the end of the score line **19**. As is clearly shown in FIGURE 4, the bead is upwardly directed and is smoothly curved so that it may absorb impact energy when it is struck by a foreign object.

The score line **21** is protected by two protector beads **28** and **29**. The protector bead **28** is disposed between the score line **21** and the score line **16** while the protector bead **29** is formed in the tear strip starting end **22**. It is to be noted that the protector beads **28** and **29** are longitudinally staggered so as to provide full protection along

the score line **21** without interfering with the formation of the peripheral score line **16**. It is also to be noted that the inner ends of the protector beads **28** and **29** are disposed immediately adjacent the pull tab **23** and that the outer ends of the protector beads **28** and **29** are spaced substantially equidistance from the chuck wall **15**, thereby providing adequate protection for the score line **21**. Like the protector bead **27**, the protector beads **28** and **29**, as is clearly shown in FIGURE 3, are disposed in upwardly projecting relation and are smoothly curved so as to absorb impact energy from a foreign object.

It is pointed out here that the protector bead **29** has a dual function in that by being disposed within the tear strip **18**, it assures that the tearing of the end panel **14** generally along the score line **21** will result in the interception of the tear by the peripheral score line **16**. In this manner a continuation of the tearing of the end panel along the score line **21** into the peripheral score line **16** will be assured.

It is also pointed out here that the beads **27**, **28** and **29** have a further incidental function. The score lines formed in the end panel **14** are not cut therein, but are pressed therein. As a result, there is a displacement of the metal of the end panel to opposite sides of the score lines. By forming the protector beads **27**, **28** and **29** immediately adjacent the score lines **19** and **21**, the metal from the score lines may be absorbed within the protector beads.

Although only a preferred easy-opening score line and tear strip arrangement has been illustrated herein, it is to be understood that the invention is not restricted to the specific easy-opening can end construction illustrated herein in that the protector bead arrangement may be equally as well utilized in similar, but different, end constructions. Accordingly, minor variations may be made in the invention without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. An easy-opening can end of the type including an end panel having a removable portion defined by a peripheral score line, a tear strip formed in said removable portion and defined primarily by said peripheral score line and an inner score line, said tear strip including a starting end portion defined in part by an end portion of said inner score line and a third score line having an outer end intersecting said peripheral score line, and said panel within said peripheral score line having a bead disposed immediately adjacent one of said score lines for protecting said one score line against accidental rupture due to external impact on said end panel.

2. The can end of claim **1** wherein said end panel is surrounded by an upstanding wall disposed closely adjacent said peripheral score line and protecting said peripheral score line, and said bead being positioned adjacent one of said score lines other than said peripheral score line.

3. The can end of claim **1** wherein said one score line is said inner score line and said bead is disposed inwardly of said tear strip.

4. The can end of claim **1** wherein said one score line is said inner score line and said bead is disposed inwardly of said tear strip, said bead extending along a substantial portion of said inner score line.

5. The can end of claim **1** wherein said end panel is surrounded by an upstanding wall disposed closely adjacent said peripheral score line and protecting said peripheral score line, and said one score line is said inner score line and said bead is disposed inwardly of said tear strip.

6. The can end of claim **1** wherein said one score line is said third score line and said bead is disposed intermediate said tear strip and said peripheral score line.

7. The can end of claim **1** wherein said one score line is said third score line and said bead is disposed along said tear strip.

8. The can end of claim **1** wherein said one score line is said third score line and said bead is disposed intermediate said tear strip and said peripheral score line and a second bead is disposed along said tear strip immediately adjacent said third score line.

9. The can end of claim **1** wherein said one score line is said third score line and said bead is disposed intermediate said tear strip and said peripheral score line and a second bead is disposed along said tear strips immediately adjacent said third score line, each of said beads extending along a substantial portion of said third score line and the ends of said beads being in staggered relation.

10. The can end of claim **1** wherein said end panel is surrounded by an upstanding wall disposed closely adjacent said peripheral score line and protecting said peripheral score line, and said one score line is said inner score line and said bead is disposed inwardly of said tear strip, said bead extending along a substantial portion of said inner score line, a second bead is disposed along said third score line intermediate said tear strip and said peripheral score line, a third bead is disposed along said tear strip immediately adjacent said third score line, each of said second and third beads extending along a substantial portion of said third score line and the ends of said beads being in staggered relation, and a pull tab secured to said starting end portion and overlying the terminal end thereof in protective relation immediately adjacent each of said score lines.

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