Sept. 19, 1967 L. F. IRLAND 3,342,367

WINDOW CAN END UNIT

Filed Oct. 20, 1965

FIG. 1

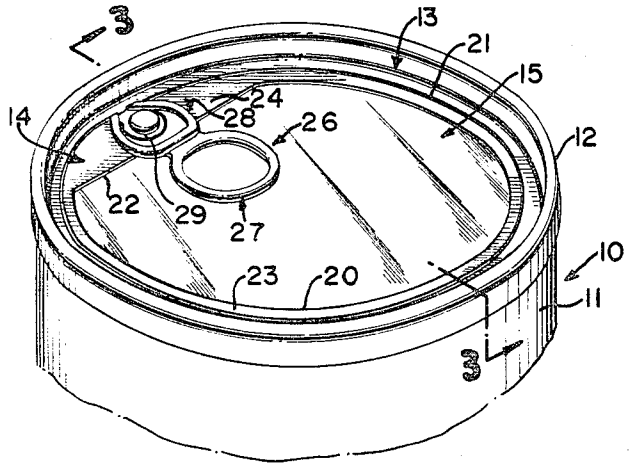


FIG. 2

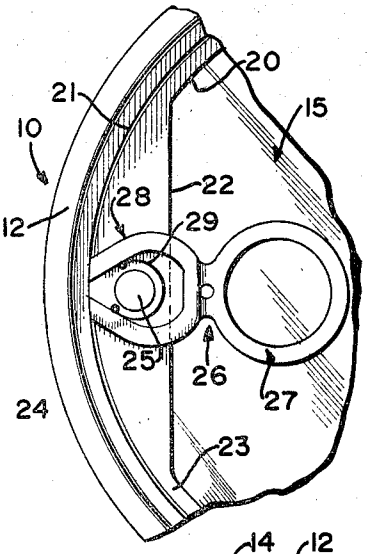


FIG. 3

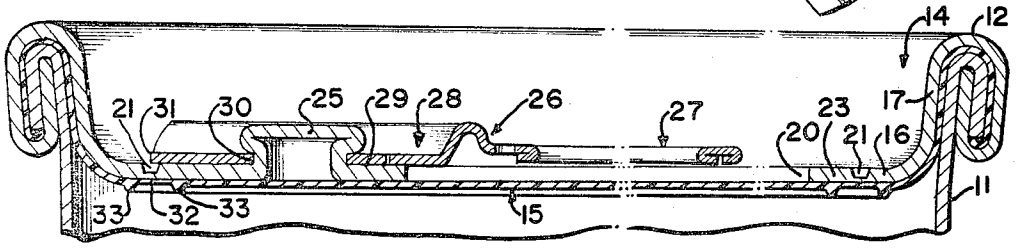


FIG. 4

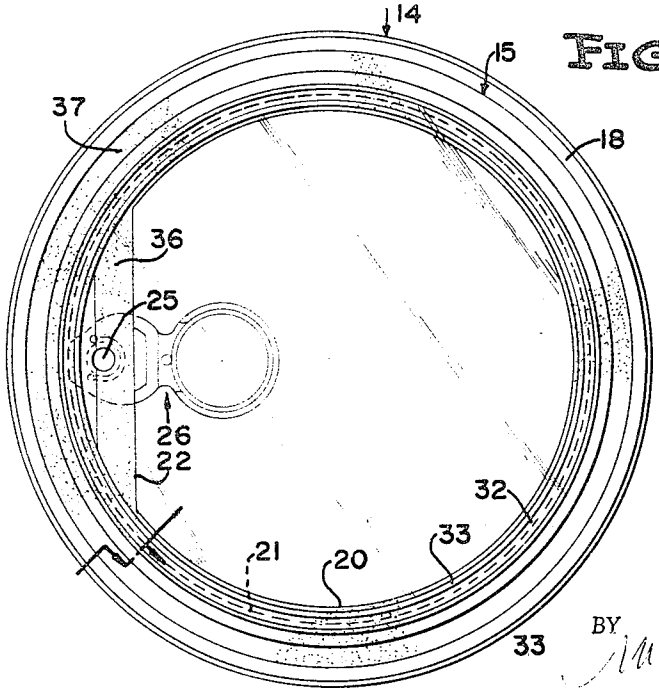
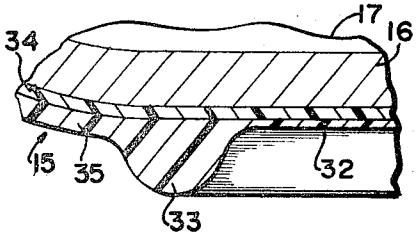


FIG. 5



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WINDOW CAN END UNIT

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This invention relates in general to new and useful improvements in can ends of the window type, and more particularly to a novel easy opening window can end.

The usual window can end is in the form of a unit which includes a conventional type of can end having a portion of the end panel thereof cut away to define a window opening, and a panel of transparent material is sealed to the underside of the end panel closing the window opening. When it is desired to open the container, it is necessary to either utilize a can opener to remove the end panel and transparent panel in the normal manner or to cut away the transparent panel in alignment with the window opening and dispense the product through the smaller area of the window opening. Both of these are obviously inconvenient, particularly when no opening tool is available.

In accordance with this invention, it is proposed to provide a novel window can end unit wherein the end panel of the can end is provided with a weakening line surrounding the window opening, and a pull tab is secured to the end panel intermediate the weakening line and the window opening whereby when it is desired to open a can of which the window can end unit is a part, it is merely necessary to pull upon the pull tab to remove substantially all of the end panel and the transparent panel.

Another object of this invention is to provide a novel window can end unit which includes a conventional type of can end having a portion of the end panel thereof removed to define a window opening and the end panel being provided with a peripheral weakening line to facilitate the tearing out of a major portion of the end panel, and the can end having bonded to the underside thereof a transparent panel which closes the window opening, the transparent panel being bonded to the underside of the end panel generally in alignment with the weakening line whereby when the end panel is torn along the weakening line, the transparent panel will be torn in a like manner.

Still another object of this invention is to provide a novel window can end unit of the foregoing type wherein the transparent panel is provided with ribs on opposite sides of the weakening line to limit the tearing of the transparent panel to generally the area aligned with the weakening line.

A further object of this invention is to provide a novel window can end unit of the type set forth above wherein the transparent panel is of a minimum thickness in alignment with the weakening line and the material displaced in the thinning of the transparent panel is re-formed as ribs disposed on opposite sides of the thinned area to both facilitate the tearing of the transparent panel in alignment with the weakening line and to so limit the tearing of the transparent panel.

Yet another object of this invention is to provide a novel transparent panel for use with a can end in the formation of a window can end unit, the transparent panel being of a laminated construction and including at least an inner layer and an outer layer, the inner layer having a tear strip portion of minimum thickness with the material of the inner layer which is displaced in the thinning thereof being reshaped as a pair of ribs disposed on opposite sides of the tear strip.

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 fragmentary top perspective view of a can incorporating the can end unit of this invention.

FIGURE 2 is an enlarged fragmentary plan view of the can end unit.

FIGURE 3 is an enlarged fragmentary vertical sectional view taken along the line 3—3 of FIGURE 1 with intermediate portions of the can end unit being broken away.

FIGURE 4 is a bottom plan view of the window can end unit prior to the securement thereof to a can body.

FIGURE 5 is an enlarged fragmentary sectional view taken along the line 5—5 of FIGURE 4.

Referring now to the drawings in detail, it will be seen that there is illustrated in FIGURES 1, 2 and 3 a can which 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 double seam 12 the window can end unit which is the subject of this invention, the window can end unit being generally referred to by the numeral 13. The window can end unit 13 is basically formed of a can end, which is generally referred to by the numeral 14, and a panel, which is generally referred to by the numeral 15, the panel preferably being transparent.

The basic construction of the can end 14 is that of a conventional can end. Basically, the can end 14 includes an end panel 16 which is surrounded by an upstanding chuck wall 17. The chuck wall 17 terminates in a flange 18 particularly adapted for the securement to a can body, such as the can body 11, by means of a double seam, such as the double seam 12. However, the can end 14 differs from conventional can ends in that a major portion of the end panel 16 is cut away to define a window opening 20. In addition, the end panel 16 is provided with a peripheral weakening line 21 in the form of a score. It is to be noted that the score line 21 is disposed adjacent the chuck wall 17 so that a major portion of the end panel 16 may be removed in the opening of the can 10.

At this time it is pointed out that the can end 14 illustrated in the drawings is a conventional circular can end and that the score line 21 is circular in outline. It is also to be noted that a major portion of the outline of the window opening 20 is circular and concentric to the score line 21. However, a portion of the window opening 20 is defined by a straight line 22 which is disposed generally chordal with respect to both the circular outline portion of the window opening 20 and the circular score line 21. It will be apparent from FIGURE 1 that the particular shaping of the window opening 20 and the outline of the score line 21 results in the formation of a removable end panel portion 23 of which the major portion is ring shaped, but including a relatively wide strap like portion 24 disposed between the straight line edge 22 of the window opening 20 and the adjacent portion of the score line 21. It is to be understood that the invention is not to be limited to either a circular can end or the specific outline of window opening. However, a relatively wide strap portion, such as the strap portion 24, must form part of the removable panel portion for reasons which will become apparent hereinafter.

The strap portion 24 is worked upon to define an integral rivet 25. The integral rivet 25 is utilized in securing a pull tab, which is generally referred to by the numeral 26, to the removable end panel portion 23. It will be apparent that in order to provide sufficient metal for the formation of the rivet 25, the strap portion 24 must be of a certain width.

Although the illustrated can end is circular in outline, the invention is not so limited. For example, the can end may be rectangular in outline and the equivalent of the strap like portion **24** may be in one corner of the can end.

The specific configuration of the pull tab **26** is not a part of this invention. However, it is pointed out here that the pull tab **26** is formed of sheet metal which has edge portions thereof reversely folded to provide for a maximum strength where needed. Generally speaking, the pull tab **26** may be considered as including a ring portion, which is generally referred to by the numeral **27**, and an attaching portion, which is generally referred to by the numeral **28**. The ring portion **27** is hingedly connected to the attaching portion **28** so that the ring portion **27** may be initially lifted relative to the end panel **16**, and then an upwardly directed force may be applied to the attaching portion **28**.

It is also pointed out that the attaching portion **28** includes an attaching ear **29** which is hingedly connected to the remainder thereof. The attaching ear **29** has an opening **30** through which the rivet **25** passes. It is to be noted that the rivet **25** is upset to secure the attaching ear **29** firmly against the end panel **16**. It is also to be noted that a free edge **31** of the attaching portion **28** is aligned with the score line **21**. When the attaching portion **28** is lifted, it will pivot relative to the attaching ear **29** and the free edge **31** will exert a downwardly directed force on the end panel **16** in alignment with the score line **21** to initially rupture the end portion **16**. The pull tab **26** may then be pulled upwardly and to the right, as viewed in FIGURE 3 to completely tear out the removable end panel portion **23**.

It is highly desirable that the panel **15** be effectively sealed with respect to the can end **14** and at the same time that portion thereof underlying the removable panel portion **23** be removed automatically therewith in the opening of the can **10**. To this end, the panel **15** has a tear strip portion **32** which is aligned with the score line **21**. The tear strip portion **32** is thinner than the remainder of the panel **15** so as to facilitate the tearing thereof. In order to limit the tearing of the panel **15** to the tear strip portion **32**, the material displaced in the thinning of the panel **15** along the tear strip portion **32** is utilized to form a pair of ribs **33** which are disposed on opposite sides of the tear strip portion **32**.

Referring now to FIGURE 5 in particular, it will be seen that the panel **15** may be of a laminated construction. The laminated panel **15** may include an outer layer **34**, which is of a constant thickness, and an inner layer **35** which is thinned to define the tear strip portion **32** and which has the ribs **33** formed integrally therewith. It has been found that Saran forms a satisfactory outer layer while Mylar forms a satisfactory inner layer. In a preferred embodiment of the invention, the panel **15** is formed of a layer of Saran having a thickness of 0.00075 inch and an inner layer formed of Mylar having a thickness of 0.002 inch. The tear strip portion **32** of the Mylar layer is reduced to a thickness to form the beads **33** having a radius of approximately 0.003 inch.

In the sealing of the panel **15** to the can end **14**, it is preferred that the panel **15** extend out into the flange **18** of the can end so that it may become clamped between the can body and the can end in the formation of the double seam **12** in the manner shown in FIGURE 3 so as to assure the proper sealing of the panel **15** with respect to the can body **11**. When the panel **15** is of this extent, the peripheral portion thereof should be bonded to the can end **14**, and this is preferably accomplished by means of a heat sealing operation.

It is also desired that the panel **15** be bonded to the end panel **16** in underlying relation to the score line **21**. This bonding can also be accomplished by heat sealing. It is to be noted that in the illustrated form of the invention, the panel **15** is bonded to the can end **14** from the inner rib **33** outwardly to the peripheral edge of the

panel **15**. On the other hand, the heat sealing of the panel **15** to the can end **14** may be restricted to that area of the panel **15** disposed between the two ribs **33**. In this event, the ribs **33** will also function to absorb heat and restrict the heat sealing of the end panel **15** to the can end **14**.

It is to be noted that the panel **15** is sealed to the removable portion **23** of the end panel **16** including along the strap portion **24**. The heat sealing to the strap portion is in the form of a strip which is identified by the numeral **36** in FIGURE 4. The peripheral heat sealing is identified by the numeral **37**.

It will be readily apparent that when the end panel **16** is ruptured along the score line **21** and the removable portion **23** is lifted, the underlying portion of the panel **15** will be lifted and will be torn against the raw edge of the outer peripheral portion of the end panel **16**. Of course, by making the panel **15** thinner in alignment with the score line **21** and providing the ribs **33**, rupture of the panel **15** generally in alignment with the score line **21** is assured

Although only a preferred embodiment of the invention has been specifically illustrated and described herein, it is to be understood that minor variations may be made in the disclosed can end within the spirit and scope of the invention, as defined by the appended claims.

I claim:

1. A window can end unit comprising a can end and a panel of transparent material, said can end including an end panel and a peripheral attaching portion, a window opening in said end panel, said transparent panel being sealed to said end panel and closing said window opening, in peripheral weakening line in said end panel surrounding said window opening and a pull tab secured to said end panel intermediate said weakening line and said window opening for facilitating the tearing out of all of said can end unit disposed within the outline of said weakening line.

2. The window can end unit of claim **1** wherein a major portion of the periphery of said window opening is disposed equidistant from said weakening line, and a small portion of the periphery of said window opening is disposed a greater distance from said weakening line and defining a pull tab connecting area on said end panel.

3. The window can end unit of claim **1** wherein said weakening line is of a circular outline, a major portion of the outline of said window opening being circular and concentric with said weakening line, the outline of said window opening also including a radially inwardly displaced line portion, and there being a relatively wide end panel portion disposed between said weakening line and said window opening radially inwardly displaced line portion to which said pull tab is attached.

4. The window can end unit of claim **1** wherein said transparent panel is bonded to said end panel along said weakening line.

5. The window can end unit of claim **1** wherein said transparent panel is bonded to said end panel along said weakening line, and extending into said peripheral attaching portion for sealing engagement with a can body.

6. The window can end unit of claim **1** wherein said transparent panel extends outwardly of said weakening line and has a pair of spaced apart reinforcing ribs disposed on opposite sides of said weakening line to confine the tearing of said transparent panel when said end panel unit is being torn open.

7. The window can end unit of claim **1** wherein said transparent panel extends outwardly of said weakening line and has a pair of spaced apart reinforcing ribs disposed on opposite sides of said weakening line to confine the tearing of said transparent panel when said end panel unit is being torn open, and that portion of said transparent panel disposed between said ribs is bonded to the underside of said end panel.

8. The window can end unit of claim **1** wherein said transparent panel extends outwardly of said weakening

line and has a pair of spaced apart reinforcing ribs disposed on opposite sides of said weakening line to confine the tearing of said transparent panel when said end panel unit is being torn open, and that portion of said transparent panel disposed between said ribs is thinner than the rest of said transparent panel to facilitate tearing of said transparent panel between said ribs.

9. The window can end unit of claim **1** wherein said transparent panel extends outwardly of said weakening line and has a pair of spaced apart reinforcing ribs disposed on opposite sides of said weakening line to confine the tearing of said transparent panel when said end panel unit is being torn open, and that portion of said transparent panel disposed between said ribs is thinner than the rest of said transparent panel to facilitate tearing of said transparent panel between said ribs, the material of said ribs being that resulting from the thinning of said transparent panel.

10. The window can end unit of claim **1** wherein said transparent panel extends outwardly of said weakening line and has a pair of spaced apart reinforcing ribs disposed on opposite sides of said weakening line to confine the tearing of said transparent panel when said end panel unit is being torn open, said transparent panel being of a laminated film construction and including at least an inner layer and an outer layer, and said ribs being formed on only said inner layer.

11. The window can end unit of claim **1** wherein said transparent panel extends outwardly of said weakening line and has a pair of spaced apart reinforcing ribs disposed on opposite sides of said weakening line to confine the tearing of said transparent panel when said end panel unit is being torn open, said transparent panel being of a laminated film construction and including at least an inner layer and an outer layer, and said ribs being formed on only said inner layer, that portion of said inner layer disposed between said ribs being thinner than the rest of said transparent panel to facilitate tearing of said transparent panel between said ribs.

12. The window can end unit of claim **1** wherein said transparent panel extends outwardly of said weakening line and has a pair of spaced apart reinforcing ribs disposed on opposite sides of said weakening line to confine the tearing of said transparent panel when said end panel unit is being torn open, said transparent panel being of a laminated film construction and including at least an inner layer and an outer layer, and said ribs being

formed on only said inner layer, that portion of said inner layer disposed between said ribs being thinner than the rest of said transparent panel to facilitate tearing of said transparent panel between said ribs, the material of said ribs being that resulting from the thinning of said inner layer.

13. A panel for a window can end, said panel being formed of a tearable material and having formed on the underside thereof two closely spaced apart ribs defining therebetween a tear strip portion.

14. A panel for a window can end, said panel being formed of a tearable material and having formed on the underside thereof two closely spaced apart ribs defining therebetween a tear strip portion, and said tear strip portion being thinner than the rest of said panel to facilitate the tearing of said panel.

15. A panel for a window can end, said panel being formed of a tearable material and having formed on the underside thereof two closely spaced apart ribs defining therebetween a tear strip portion, and said tear strip portion being thinner than the rest of said panel to facilitate the tearing of said panel, the material of said ribs being that displaced from said tear strip portion forming said ribs.

16. The panel of claim **13** wherein said tearable material is a lamination of at least two layers and said ribs are formed on only one of said layers.

17. The panel of claim **14** wherein said tearable material is a lamination of at least two layers and said ribs are formed on only one of said layers, and the thinning of said panel is primarily confined to said one layer.

18. The panel of claim **14** wherein said tearable material is a lamination of at least two layers and said ribs are formed on only one of said layers, and the thinning of said panel is primarily confined to said one layer, the material of said ribs being that displaced from said tear strip portion forming said ribs.

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