Nov. 2, 1965 H. E. FRANKENBERG 3,215,305

WIRE OPENER FULCRUMED ON CAN-END FOR BREAKING SCORED SEGMENT THEREOF

Filed Sept. 27, 1963

FIG. 1

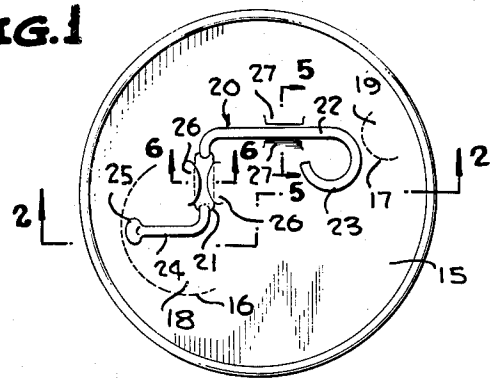


FIG. 5

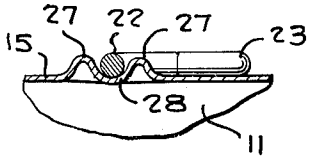


FIG. 2

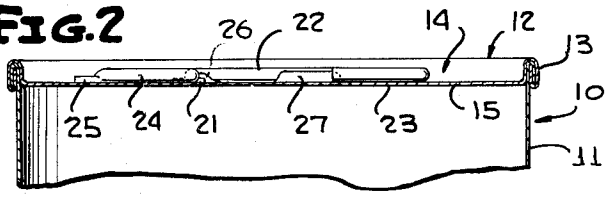


FIG. 6

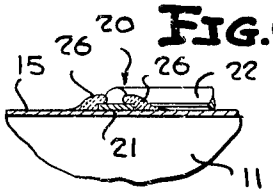


FIG. 3

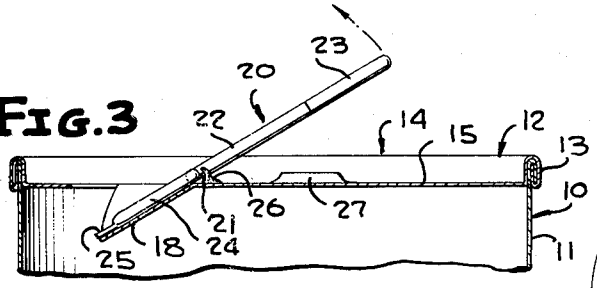


FIG. 7

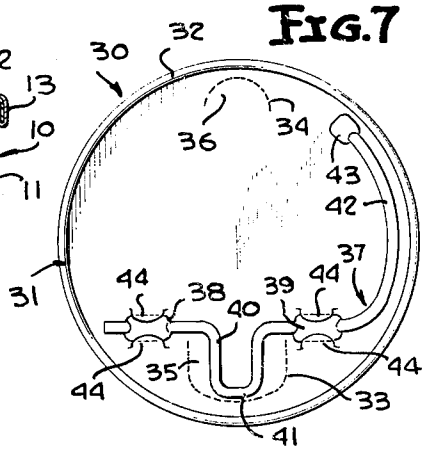
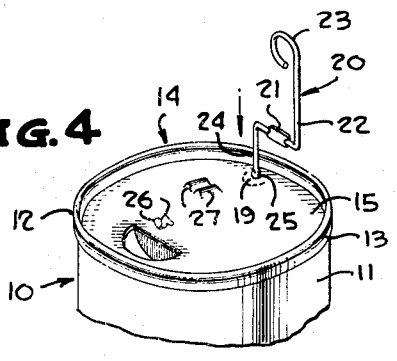


FIG. 4



INVENTOR
HENRY E. FRANKENBERG

BY Mason, Porter, Miller & Stewart
ATTORNEYS

United States Patent Office 3,215,305 Patented Nov. 2, 1965

3,215,305

WIRE OPENER FULCRUMED ON CAN-END FOR BREAKING SCORED SEGMENT THEREOF

Henry E. Frankenberg, Berwyn, Ill., assignor to Continental Can Company, Inc., New York, N.Y., a corporation of New York

Filed Sept. 27, 1963, Ser. No. 312,203
12 Claims. (Cl. 220—48)

This invention relates in general to new and useful improvements in easy opening containers, and more particularly relates to a container end unit which is provided with spaced dispensing and vent openings and a single opening device for effecting the opening of both the dispensing and vent openings.

A normal beverage can, when the entire end thereof is not removed, must be provided with both a dispensing opening and a vent opening to provide for the necessary flow of liquid through the dispensing opening. Means have been provided on container ends both for the removal of the entire end panels thereof and for the formation of a large pouring opening without the use of conventional types of openers. However, it is highly desirable that the dispensing opening and vent opening be spaced and it is the primary object of this invention to provide a container end unit which includes a container end having an end panel which includes both a dispensing opening portion and a vent opening portion, the container end unit further including an opening device which is sequentially useable for the opening of both the dispensing opening and the vent opening.

Another object of this invention is to provide a novel container end unit of the type which includes a container end having an end panel which is provided with both a dispensing opening and a vent opening and there being secured to the end panel an opening device which is so mounted wherein when one end of the opening device is lifted, the dispensing opening portion is depressed, and after the opening of the dispensing opening has been accomplished, the opening device is released from the can end and is useable for the purpose of pressing the vent opening portion to an open position.

Another object of this invention is to provide in a container end unit an opening device which is hingedly connected to an end panel of the end unit in a manner wherein after it is initially utilized for the purpose of depressing inwardly a portion of the end panel, it is thereafter released from the end panel.

Another object of this invention is to provide a novel connection between an opening device of a container end unit and an end panel thereof, the opening device including a relatively flat hinge portion which is seated on the end panel, and the end panel being provided with projections disposed on opposite sides of the hinge portion and partially overlying the hinge portion whereby after the opening device has been initially pivoted to effect a partial opening of the end panel, the flat hinge portion has twisted to a position whereby it is edgewise removable from between the two projections of the end panel.

Another object of this invention is to provide a novel container end unit in accordance with the foregoing wherein the projections on the end panel are in the form of solder spots.

A further object of this invention is to provide in a container end unit, an end panel having a weakening line thereon defining a dispensing opening, and an opening device hingedly connected to the end panel, the opening device including a lift portion and a depressor portion, the depressor portion overlying the dispensing opening portion and having an extreme part disposed immediately adjacent the weakening line to apply an initial rupturing

pressure on the dispensing opening portion immediately adjacent the weakening line.

A still further object of this invention is to provide a novel container end unit in accordance with the foregoing wherein the mounting of the opening device on the end panel is such that accidental movement of the opening device is prevented during handling.

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 container end unit formed in accordance with this invention and shows generally the details thereof.

FIGURE 2 is an enlarged fragmentary vertical sectional view taken generally along the line **2—2** of FIGURE 1 and shows the specific details of a container utilizing the container end unit of FIGURE 1.

FIGURE 3 is an enlarged fragmentary vertical sectional view similar to FIGURE 2 and shows the opening device in the process of being pivoted and the movement of the dispensing opening portion inwardly into the interior of the container.

FIGURE 4 is a fragmentary top perspective view of the container of FIGURE 2 on a reduced scale and shows the dispensing opening portion moved inwardly to an opened position and the opening device removed from the end panel and positioned for moving the vent opening portion to an opened position.

FIGURE 5 is an enlarged fragmentary vertical sectional view taken along the line **5—5** of FIGURE 1 and shows the configuration of the end panel adjacent the lift portion of the opening device to prevent the accidental displacement thereof.

FIGURE 6 is an enlarged fragmentary vertical sectional view taken along the line **6—6** of FIGURE 1 and shows the specific details of the hinge connection between the opening device and the end panel.

FIGURE 7 is a plan view of a modified form of container end unit involving the spirit of this invention.

Referring first to FIGURES 1 through 6, it will be seen that there is illustrated a container which is generally referred to by the numeral **10** and which is illustrated as being in the form of a can, including a can body **11**. The container **10** also includes a container end unit **12**, formed in accordance with this invention, and secured to the can body **11** by means of a conventional double seam **13**. The container end unit **12** includes a container end **14** which has an end panel **15**. As is best shown in FIGURE 1, the end panel **15** is provided with a first weakening line **16**, which may be in the form of an interrupted score line, and a second weakening line **17**, which may also be in the form of an interrupted score line. The weakening line **16** defines a relatively large dispensing opening portion **18** while the weakening line **17**, which is disposed generally diametrically opposite the weakening line **16**, defines a smaller vent opening portion **19**. It is to be understood that the end panel **15** is initially imperforate.

In order to facilitate the movement of the dispensing opening portion **18** and the vent opening portion **19** to open positions whereby the dispensing of the contents of the container **10** may be facilitated, the container end unit **12** also includes an opening device, generally referred to by the numeral **20**, which is carried by the end panel **15** and seated within the confines of the container end **14**. The opening device **20** is formed of a rigid wire member, which is provided with an offset intermediate hinge portion **21**. The hinge portion **21** has integrally connected thereto at one end thereof a lift por-

tion 22 which terminates in a lifting ring 23. The opposite end of the hinge portion 21 has integrally connected thereto a depressor portion 24, which extends generally parallel to the lift portion 22 and which terminates in a relatively wide terminal portion 25. The depressor portion 24 overlies the dispensing opening portion 18 and the terminal portion 25 engages the dispensing opening portion 18 immediately adjacent the weakening line 16.

The flattened hinge portion 21, as is best shown in FIGURE 6, is secured to the end panel 15 for hinging movement by a pair of opposed projections 26 which are disposed on opposite sides of the hinge portion 21 and which partially overlap the hinge portion 21 with there being a gap therebetween. The hinge portion 21 lies flat on the upper surface of the end panel 15.

The end panel 15 is also configurated to define a pair of parallel projections 27 which are disposed on opposite sides of the lift portion 22, as is best shown in FIGURES 1 and 5. The lift portion 22 lies in a trough 28 between the projections 27 and is prevented by the projections 27 from being accidentally twisted during the normal handling of the container end unit 12.

When it is desired to open the container 10, the grip or ring portion 23 of the lift portion 22 is encased by one's fingers and an upward force directed thereupon with the result that the opening device 20 hinges or pivots about the axis of the hinge portion 21 and the depressor portion 24 is moved downwardly towards the interior of the container 10. When the terminal end of the depressor portion 24 engages the dispensing opening portion 18 immediately adjacent the weakening line 16, it will be apparent that the end panel 15 will rupture along the weakening line 16 and the dispensing opening portion 18 will be pivoted downwardly into the interior of the container 10 in the manner best shown in FIGURE 3. In view of the fact that the projections 26 are formed of relatively soft solder spots, it will be readily apparent that the necessary hinging of the opening device 20 will take place. After the dispensing opening portion 18 has been forced into the interior of the container 10, and assumes a position disposed generally at right angles to the plane of the end panel 15, as is shown in FIGURE 4, the hinge portion 21 is now lying on edge between the projections 26 and may be readily disengaged from the projections 26 and released from the end panel 15.

The removed opening device 20 may then be used endwise, as is shown in FIGURE 4, for the purpose of rupturing the weakening line 17 and removing the vent opening portion 19 downwardly into the interior of the container 10 to complete the opening of the container end 14.

In FIGURE 7 there is illustrated a modified form of container end unit, generally referred to by the numeral 30. The container end unit 30 includes a container end 31 having an end panel 32. The end panel 32 is provided with a first weakening line 33 and a second weakening line 34, the weakening lines being shown as being in the form of interrupted score lines although other types of weakening may be employed. The weakening line 33 is generally U-shaped in outline and defines a dispensing opening portion 35 while the weakening line 34 defines a much smaller vent opening 36.

The container end unit 30 includes an opening device, generally referred to by the numeral 37, which is in the form of a rigid wire member. The opening device 37 includes two aligned hinge portions 38 and 39 having disposed therebetween a generally U-shaped depressor portion 40. The depressor portion 40 overlies the dispensing opening portion 35 and includes an intermediate part 41 which is disposed immediately adjacent the weakening line 33 to facilitate the initial rupture of the end panel 32 along the weakening line 33. The opening device 37 also includes a lift portion 42 which is arcuate in outline and which is disposed generally concentric to

the peripheral edge of the end panel 32. The lift portion 42 terminates in a flattened terminal part 43.

Each of the hinge portions 38 includes a flattened part which lies directly upon the end panel 32. The flattened part of each of the hinge portions 39 is engaged by a pair of opposed projections 44 which partially overlie the flattened part and have a gap therebetween. The projections 44 are preferably in the form of solder spots, like the projections 26. The cross section shown in FIGURE 6 is a typical cross section through one of the hinge portions 38 and 39.

The opening device 37 being provided with two hinge portions 38 and 39, it will be seen that movement of the opening device 37 relative to the end panel 32 is restrained and thus so limited to hinging about the common axis of the hinge portions 38 and 39.

When it is desired to open the container 30, an upwardly directed lifting force is applied to the lift portion 32 with the result that the opening device 37 pivots about the axis of the hinge portions 38 and 39 and the depressor portion 40 is depressed downwardly to rupture the end panel 32 along the weakening line 33 to force the dispensing opening portion 35 inwardly into the interior of the container 30. After the dispensing opening portion 35 has been forced into the interior of the container 30, the flattened parts of the hinge portions 38 and 39 have rotated to positions wherein they are released from between the projections 44 and the opening device 37 may be readily removed from the end panel 32. The lift portion 42 may then be grasped and the opposite end of the opening device 37 engaged with the vent opening portion 36 to rupture the end panel 32 along the weakening line 34 and force the vent opening portion 36 downwardly into the interior of the container 30.

It is to be noted that all of the opening devices of the two container end units are disposed entirely within the confines of the container ends and the containers 10 and 30 may be stacked in the conventional manner.

Although only two preferred embodiments of the invention have been specifically illustrated and described herein, it is to be understood that other minor modifications may be made in the container end unit construction of this invention, as defined by the appended claims.

I claim:

1. An easy opening container end unit comprising a container end including an end panel, a weakening line on said end panel defining a dispensing opening portion, a rigid opening device having an offset intermediate hinge portion secured to said end panel adjacent to said dispensing opening portion for hinging movement, a lift portion projecting from one end of said hinge portion remote from said dispensing opening portion, and a depressor portion extending from the other end of said hinge portion towards and overlying said dispensing opening portion, said depressor portion having an extreme part disposed immediately adjacent said weakening line to apply an initial rupturing pressure on said dispensing opening portion adjacent said weakening line, said hinge portion being retained in place by retainers disposed on opposite sides of said hinge portion and said hinge portion being generally flat whereby when said opening device is rotated to a position wherein said dispensing opening portion is in an open position said opening device is released.

2. An easy opening container end unit comprising a container end including an end panel, a weakening line on said end panel defining a dispensing opening portion, a rigid opening device having an offset intermediate hinge portion secured to said end panel adjacent to said dispensing opening portion for hinging movement, a lift portion projecting from one end of said hinge portion remote from said dispensing opening portion, and a depressor portion extending from the other end of said hinge portion towards and overlying said dispensing open-

ing portion, said depressor portion having an extreme part disposed immediately adjacent said weakening line to apply an initial rupturing pressure on said dispensing opening portion adjacent said weakening line, said hinge portion being retained in place by spots of solder disposed on opposite sides of said hinge portion and said hinge portion being generally flat whereby when said opening device is rotated to a position wherein said dispensing opening portion is in an open position said opening device is released.

3. An easy opening container end unit comprising a container end including an end panel, a weakening line on said end panel defining a dispensing opening portion, a rigid opening device having an offset intermediate hinge portion secured to said end panel adjacent to said dispensing opening portion for hinging movement, a lift portion projecting from one end of said hinge portion remote from said dispensing opening portion, and a depressor portion extending from the other end of said hinge portion towards and overlying said dispensing opening portion, said depressor portion having an extreme part disposed immediately adjacent said weakening line to apply an initial rupturing pressure on said dispensing opening portion adjacent said weakening line, said hinge portion being retained in place by retainers disposed on opposite sides of said hinge portion and said hinge portion being generally flat whereby when said opening device is rotated to a position wherein said dispensing opening portion is in an open position said opening device is released, another weakening line defining a vent opening portion, and said opening device being completely removable from said end panel for use in pushing said vent opening portion to an open position.

4. An easy opening container end unit comprising a container end including an end panel, a weakening line on said end panel defining a dispensing opening portion, a rigid opening device having an offset intermediate hinge portion secured to said end panel adjacent to said dispensing opening portion for hinging movement, a lift portion projecting from one end of said hinge portion remote from said dispensing opening portion, and a depressor portion extending from the other end of said hinge portion towards and overlying said dispensing opening portion, said depressor portion having an extreme part disposed immediately adjacent said weakening line to apply an initial rupturing pressure on said dispensing opening portion adjacent said weakening line, said opening device being in the form of a wire member and said hinge portion being flattened and lying flat on said end panel, said hinge portion being retained in place by solder spots secured to said end panel on opposite sides of said hinge portion and only partially overlying said hinge portion with a gap therebetween whereby when said opening device is rotated to a position wherein said dispensing opening portion is in an open position, said opening device is released for removal from said end panel.

5. An easy opening container end unit comprising a container end including an end panel, a weakening line on said end panel defining a dispensing opening portion, a rigid opening device having an offset intermediate hinge portion secured to said end panel adjacent to said dispensing opening portion for hinging movement, a lift portion projecting from one end of said hinge portion remote from said dispensing opening portion, and a depressor portion extending from the other end of said hinge portion towards and overlying said dispensing opening portion, said depressor portion having an extreme part disposed immediately adjacent said weakening line to apply an initial rupturing pressure on said dispensing opening portion adjacent said weakening line, said end panel having a second weakening line defining a vent opening portion adapted to be pushed to an open position with the removed opening device.

6. An easy opening container end unit comprising a container end including an end panel, a weakening line on said end panel defining a dispensing opening portion, a rigid opening device having an offset intermediate hinge portion secured to said end panel adjacent to said dispensing opening portion for hinging movement, a lift portion projecting from one end of said hinge portion remote from said dispensing opening portion, and a depressor portion extending from the other end of said hinge portion towards and overlying said dispensing opening portion, said depressor portion having an extreme part disposed immediately adjacent said weakening line to apply an initial rupturing pressure on said dispensing opening portion adjacent said weakening line, said end panel having means engaging said lift portion to restrain said opening device against accidental displacement.

7. An easy opening container end unit comprising a container end including an end panel, a weakening line on said end panel defining a dispensing opening portion, a rigid opening device having an offset intermediate hinge portion secured to said end panel adjacent to said dispensing opening portion for hinging movement, a lift portion projecting from one end of said hinge portion remote from said dispensing opening portion, and a depressor portion extending from the other end of said hinge portion towards and overlying said dispensing opening portion, said depressor portion having an extreme part disposed immediately adjacent said weakening line to apply an initial rupturing pressure on said dispensing opening portion adjacent said weakening line, said extreme part being an intermediate part of said depressor portion.

8. An easy opening container end unit comprising a container end including an end panel, a weakening line on said end panel defining a dispensing opening portion, a rigid opening device having an offset intermediate hinge portion secured to said end panel adjacent to said dispensing opening portion for hinging movement, a lift portion projecting from one end of said hinge portion remote from said dispensing opening portion, and a depressor portion extending from the other end of said hinge portion towards and overlying said dispensing opening portion, said depressor portion having an extreme part disposed immediately adjacent said weakening line to apply an initial rupturing pressure on said dispensing opening portion adjacent said weakening line, said end panel being circular in outline, and said lift portion being curved and being generally concentric with the periphery of said end panel.

9. An easy opening container end unit comprising a container end having an end panel, a weakening line on said end panel defining a dispensing opening portion, a rigid opening device having an offset depressor portion, a hinge portion connected to each side of said depressor portion, said hinge portions being aligned and a lift portion connected to one of said hinge portions for pivoting said opening device about the common axis of said hinge portions to depress said depressor portion, said depressor portion overlying said dispensing opening portion and having an extreme part disposed immediately adjacent said weakening line to apply an initial rupturing pressure on said dispensing opening portion adjacent said weakening line.

10. The container end unit of claim 9 wherein each hinge portion is retained in place by retainers disposed on opposite sides of said hinge portion and said hinge portion is generally flat whereby when said opening device is rotated to a position wherein said dispensing opening portion is in an open position said opening device is released.

11. The container end unit of claim 9 wherein each hinge portion is retained in place by retainers disposed on opposite sides of said hinge portion and said hinge portion is generally flat whereby when said opening device is rotated to a position wherein said dispensing opening portion is in an open position said opening device

is released, another weakening line defining a vent opening portion, and said opening device being completely removable from said end panel for use in pushing said vent opening portion to an open position.

12. An easy opening container end unit comprising a container end having an end panel, a weakening line on said end panel defining a dispensing opening portion, a rigid opening device having an offset depressor portion, a hinge portion connected to each side of said depressor portion, said hinge portions being aligned and a lift portion connected to one of said hinge portions for pivoting said opening device about the common axis of said hinge portions to depress said depressor portion, said depressor portion overlying said dispensing opening portion and having an extreme part disposed immediately adjacent said weakening line to apply an initial rupturing pressure on said dispensing opening portion adjacent said weakening line, said opening device being in the form of a wire member and each hinge portion being flattened and lying flat

on said end panel, each hinge portion being retained in place by solder spots secured to said end panel on opposite sides of said hinge portion and only partially overlying said hinge portion with a gap therebetween whereby when said opening device is rotated to a position wherein said dispensing opening portion is in an open position, said opening device is released for removal from said end panel.

References Cited by the Examiner

UNITED STATES PATENTS

2,092,671	9/37	Hildebrandt	220—48.91
2,642,203	6/53	Seemuller	220—48

FOREIGN PATENTS

1,171,292	9/58	France.

THERON E. CONDON, *Primary Examiner.*

GEORGE O. RALSTON, *Examiner.*