

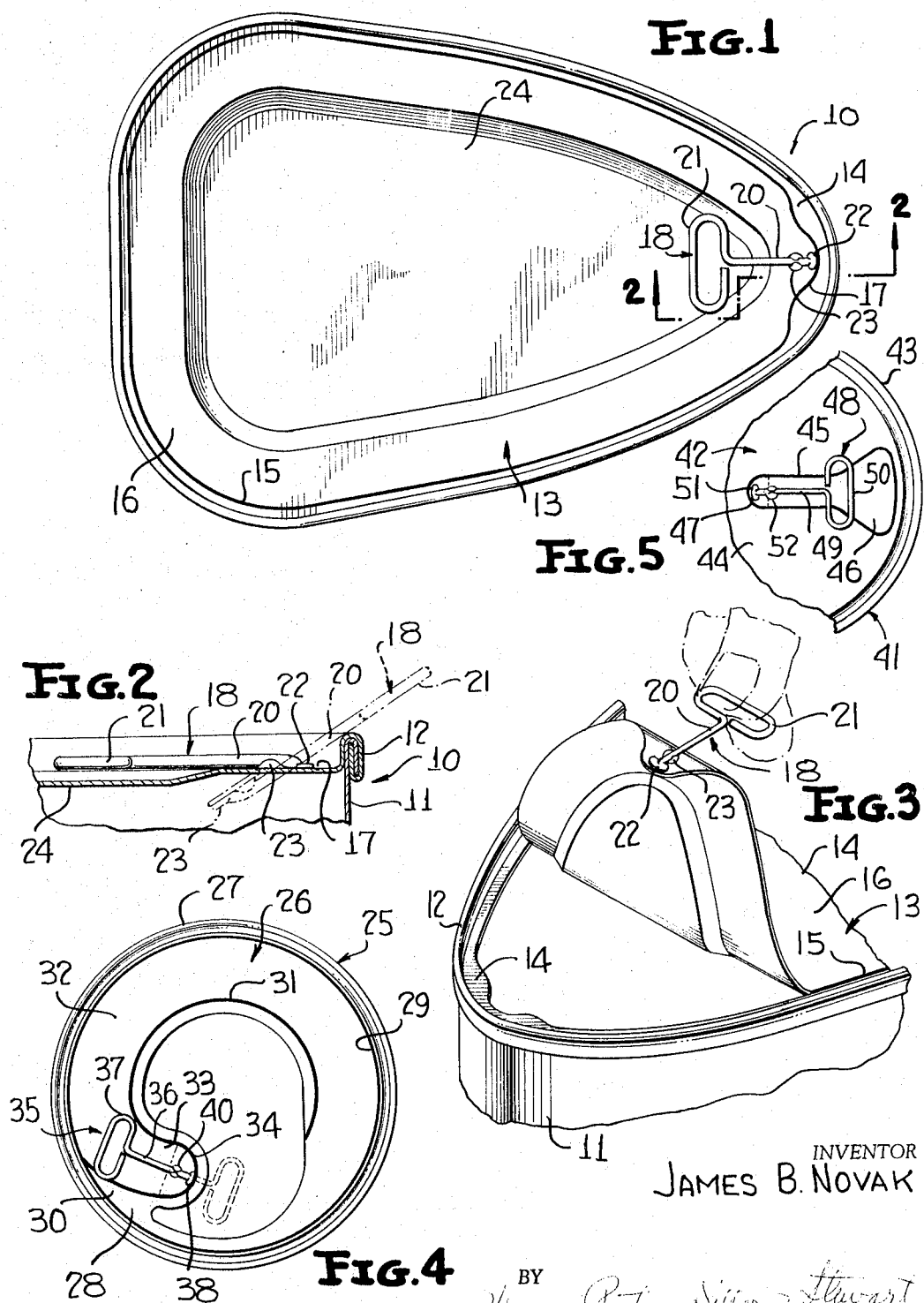
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PULL KEY OPENING CAN END

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PULL KEY OPENING CAN END

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

In recent years many advances have been made in the construction of cans to facilitate the opening thereof without utilizing a can opener. The advances have primarily been made in the construction of can ends wherein a part of the end panel of the can end is removed, the removed part varying in size depending upon whether the contents of the can to be dispensed is a liquid or a solid. The removed part of the end panel of the can is normally defined by a score line and a pull tab is attached thereto for the purpose of first rupturing the end panel along the score line, and then tearing the removable part of the end panel therefrom.

In a can construction, it is necessary that any element added to a can end be recessed entirely within the can end, otherwise the added part will interfere with the handling of the can end, the seaming of the can end to a can body, and the later handling of the resultant can. As a result, the usual opening device is a pull tab which is suitably secured to the removable part of the end panel and which extends away from the removable part. This pull tab is preferably clamped tightly against the end panel with the result that it is extremely difficult to lift the pull tab to effect the initial rupture of the can end. Furthermore, because the usual pull tab is of the second-class lever type, an upward force directed upon the removable part of the end panel by means of the pull tab is directed over a relatively large area, and a considerable lifting force is required. For example, in conventional beverage cans of the easy opening type, it has been found that a force of approximately 14 inch pounds is required to accomplish the initial rupturing of the end panel along the score line despite the fact that the score line formed in the end panel is of a maximum depth at the point where initial rupture occurs. In view of the foregoing, it is the primary object of this invention to provide the removable part of an easy opening can end with a pull tab or key which is so connected to the end panel whereby the opening force exerted on the end panel by means of the pull tab or key is directed against the point of maximum weakness and thereby the necessary lifting force to be applied on the pull tab or key is greatly reduced as compared to that presently required.

Another object of this invention is to provide in an easy opening can end of the type having a removable part defined by a score line and wherein the score line includes a starting portion, a pull tab or key which generally overlies the removable part of the can end and which is attached to the removable part for limited pivotal movement whereby an extreme end of the pull tab or key will bear against the starting portion of the score line and when an upwardly directed force is applied to the pull tab or key, a downward force will be exerted on the removable part at the score line starting portion to effect the initial rupture of the end panel in a manner wherein a minimum of force is required to effect this initial rupture.

A further object of this invention is to provide in conjunction with a removable part of an easy opening can end a pull tab or key which is so secured to the removable part wherein the pull tab or key functions as a first-class lever and when lifted places a downwardly directed force on the removable part at the score line defining the re-

movable part to effect the initial rupture of the associated can end with the application of a minimum lifting force.

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 ham can incorporating the novel pull tab or key arrangement of this invention.

FIGURE 2 is an enlarged fragmentary vertical sectional view taken generally along the line 2-2 of FIGURE 1 and shows the specific relationship of the pull tab or key with respect to the end panel of the ham can, the view also showing in phantom line the position of the pull tab or key after the initial rupture of the end panel of the ham can has occurred.

FIGURE 3 is a fragmentary perspective view showing the ham can rotated from the position of FIGURE 1 and with the removable part of the end panel thereof partially torn therefrom and in the process of being finally torn therefrom.

FIGURE 4 is a plan view of a conventional type of cylindrical can having an easy opening can end incorporating the pull tab or key of this invention, the key being shown in an initial end panel rupturing position by phantom lines.

FIGURE 5 is a fragmentary plan view of a conventional type of beverage can wherein the removable part of the end panel thereof has a pull tab or key in accordance with this invention.

Referring now to the drawings in detail, it will be seen that there is illustrated in FIGURE 1 a conventional ham can, which is generally referred to by the numeral 10. The ham can 10 includes a conventional can body 11 to which there is secured by means of a double seam 12 a cover or end, which is generally referred to by the numeral 13. The can end 13 includes the usual end panel 14 in which there is formed a score line 15 which extends about the periphery of the end panel 14 and which defines a removable part 16 which constitutes a major portion of the end panel 14. The score line 15 includes a small radius rounded starting portion 17 along which the initial rupture of the end panel 14 occurs in the opening of the can 10.

In accordance with this invention, when it is desired to open the can 10, this is accomplished by rupturing the end panel 14 along the score line 15 and removing the removable part 16. The rupture of the end panel 14 along the score line 15 occurs along the starting portion 17 of the score line, after which the removable part is merely torn upwardly and away from the end panel 14 until the end panel 14 has been completely ruptured along the entire length of the score line 15 and the removable part 16 is separate and apart from the end panel 14.

In order to facilitate the removal of the removable part 16 of the end panel 14, the can end 13 is provided with a pull member which is illustrated as being in the form of a key, generally referred to by the numeral 18, although it may be in the form of a tab. Accordingly, while reference hereinafter will be made to a pull key, it is to be understood that the invention is not limited to a key construction for the pull member.

The pull key 18 includes an elongated shank 20 which is provided at one end with a reversely bent grip portion 21. The illustrated key 18 is formed of wire and is provided at the opposite end of the shank 20 from the grip portion 21 with an enlarged bearing portion 22.

The pull key 18 is so positioned relative to the end panel 14 whereby the bearing portion 22 thereof has the extreme end thereof generally aligned with the starting portion 17 of the score line. This is clearly shown in

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FIGURES 1 and 2. The pull key 18 functions as a first-class lever and accordingly it is necessary for it to fulcrum relative to the end panel 14. In order that this may be accomplished, the shank 20 of the pull key 18 is suitably secured to the removable portion 16 of the end panel 14 as at 23. The connection between the shank 20 and the removable part 16 may be by means of soldering or welding.

It is also to be noted that in order to reinforce the end panel 14, the removable part 16 is provided with a depressed panel 24. The depressed panel 24 provides a clearance beneath the grip portion 21 of the pull key 18, as is shown in FIGURE 2.

When it is desired to open the can 10, it is merely necessary to engage one's fingers beneath the grip portion 21 and exert an upwardly directed force thereon. The pull key 18, then acting as a first-class lever, will pivot about the point of attachment 23 with the result that the bearing portion 22 of the pull key 18 will exert a downwardly directed pressure on the removable part 16 immediately adjacent the starting portion 17 of the score line. Since the opening pressure on the removable part 16 is concentrated immediately adjacent the score line starting portion 17, it will be seen that the rupture of the end panel 14 along the score line starting portion 17 may be accomplished with the application of a minimum force.

After the initial rupture of the end panel 14 occurs along the starting portion 17 of the score line, the upward movement of the grip portion 21 is continued until that portion of the removable part 16 adjacent the starting portion 17 of the score line has been bent slightly down into the interior of the can 10. The grip portion 21 of the pull key 18 is then firmly gripped between one's fingers and an upward and backward pull to the left of FIGURE 1 is exerted on the pull key with the result that the removable part 16 is torn from the remainder of the end panel 14 along the score line 15 in the manner generally shown in FIGURE 3.

Although the invention has been primarily illustrated with respect to a ham can, it is to be understood that the invention may be utilized equally as well with other types of easy opening cans. Reference is now made to FIGURE 4 wherein there is illustrated a conventional type of can which is generally referred to by the numeral 25. The can 25 includes a can end, generally referred to by the numeral 26, which is secured to the body of the can 25 by means of a conventional double seam 27. The can end 26, like the can end 13, is of the type wherein a major portion of the end panel thereof is removed in the opening of the can 25. Accordingly, the end panel of the can end 26, the end panel being referred to by the numeral 28, is provided with an outer score line 29 that extends substantially 360 degrees to define a removable part 30 of the end panel 28. In addition, the end panel 28 is provided with an inner score line 31 which is disposed for the most part concentric with the score line 29 and the two score lines 29 and 31 define a tear strip 32 which is removable in the opening of the can 25.

The tear strip 32 includes a starting portion 33 and at the starting end of the starting portion 33 there is a starting score line portion 34. The starting portion 33 is provided with a pull key which is generally referred to by the numeral 35 and which for all practical purposes may be identical with the pull key 18 although it may vary in size therefrom. The pull key 35 includes a shank 36 which is provided at one end thereof with a reversely bent grip portion 37. At the opposite end of the shank 36, the pull key is provided with an enlarged bearing portion 38. The shank 36 is secured to the starting portion 33 of the tear strip 32 by means of a suitable connection 40, which may be either soldered or welded, so that the pull key 35 may pivot relative to the end panel 28 and the bearing portion 38 of the pull key may exert a downwardly directed pressure on the extreme start-

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ing end of the tear strip 32 when the grip portion 37 of the pull key is elevated. It is to be noted that the bearing portion 38 is disposed along the starting tear line portion 34 so that a maximum pressure may be exerted on the end panel 28 at the starting score line portion 34 whereby a minimum lifting force is required to effect the initial rupture of the end panel 28.

It is to be understood that after the pull key 35 has been initially lifted and rupture of the end panel 28 has occurred along the starting score line portion 34, the pull key 35 may then be pulled rearwardly along the tear strip 32 to effect the tearing of the tear strip 32 from the end panel 28 along the score lines 29 and 31 and the removable part 30 of the end panel 28 removed therefrom by the continued tearing of the end panel along the outer score line 29.

Reference is now made to FIGURE 5 wherein there is illustrated a can, which is generally referred to by the numeral 41, particularly adapted for the dispensing of beverages. The can 41 includes a can end 42 which is secured to a customary beverage can body by means of a conventional double seam 43. The can end 42 includes an end panel 44 in which a liquid dispensing opening is to be formed. The end panel 44 is provided with a score line 45 which defines a removable part 46 of the end panel 44. The score line 45 includes a small radius starting portion 47 along which the initial rupture of the end panel 44 will occur during the opening of the can 41.

In order to facilitate the removal of the removable part 46, there is secured thereto a pull key which is generally referred to by the numeral 48. The pull key 48 is very similar to the pull keys 18 and 35, but may vary in size therefrom. The pull key 48 is of a one piece construction and includes a shank 49 which is provided at one end thereof with a reversely bent grip portion 50. At the other end of the shank 49, the key 48 is enlarged to define a bearing portion 51. The shank is secured to the removable part 46 adjacent the bearing portion 51, as at 52. The connection between the shank 49 and the removable part 46 may be by means of soldering, welding, etc.

It will be readily apparent that when the grip portion 50 is lifted, the pull key 48 will pivot about the connection 52. Since the bearing portion 51 is disposed immediately adjacent the starting portion 47 of the score line, the can end 42 will be ruptured along the starting portion of the score line. After the initial rupture has occurred, the removable part 46 may be readily torn from the end panel 44 along the score line 45.

Although only a preferred embodiment of pull member has been specifically illustrated and described herein, it is to be understood that minor modifications may be made therein within the spirit and scope of the invention, as defined in the appended claims. Also, it will be readily apparent that the easy opening principles of this invention may be incorporated in other similar container panel arrangements.

I claim:

1. An easy opening container element having a removable part defined by a weakening line, said weakening line including a starting portion along which said container element is to be first ruptured in the removal of said removable part, a rigid pull member generally overlying said removable part and extending away from said starting portion, said pull member having a bearing portion at one end overlying said removable part immediately adjacent said starting portion and a grip portion at the opposite end, and means on remote sides of said pull member hingedly connecting an intermediate portion only of said pull member to said removable portion and defining a fulcrum for said pull member whereby when said grip portion is lifted said pull member will pivot relative to said container end and said bearing portion will be depressed and a rupturing force will be applied on said removable part immediately adjacent said starting portion,

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said connecting means being of the welding and soldering type and due to the position thereof on opposite sides of said pull member forming a pivot for said pull member.

2. An easy opening container element having a removable part defined by a weakening line, said weakening line including a starting portion along which said container element is to be first ruptured in the removal of said removable part, a rigid pull member generally overlying said removable part and extending away from said starting portion, said pull member having a bearing portion at one end overlying said removable part immediately adjacent said starting portion and a grip portion at the opposite end, and means connecting an intermediate portion of said pull member to said removable portion and defining a fulcrum for said pull member whereby when said grip portion is lifted said bearing portion will be depressed and a rupturing force will be applied on said removable part immediately adjacent said starting portion, said bearing portion being enlarged and having a wide terminal edge conforming in outline to the configuration of the adjacent part of said starting portion, whereby rupture

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along said weakening line as opposed to puncture will occur.

3. The container of claim 2 wherein said pull member is formed of wire-like material and said material is flattened in the formation of said bearing portion.

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