May 23, 1967 S. D. COLLIE 3,321,123

HEAT SEALED PULL TAB

Filed Nov. 2, 1964 3 Sheets-Sheet 1

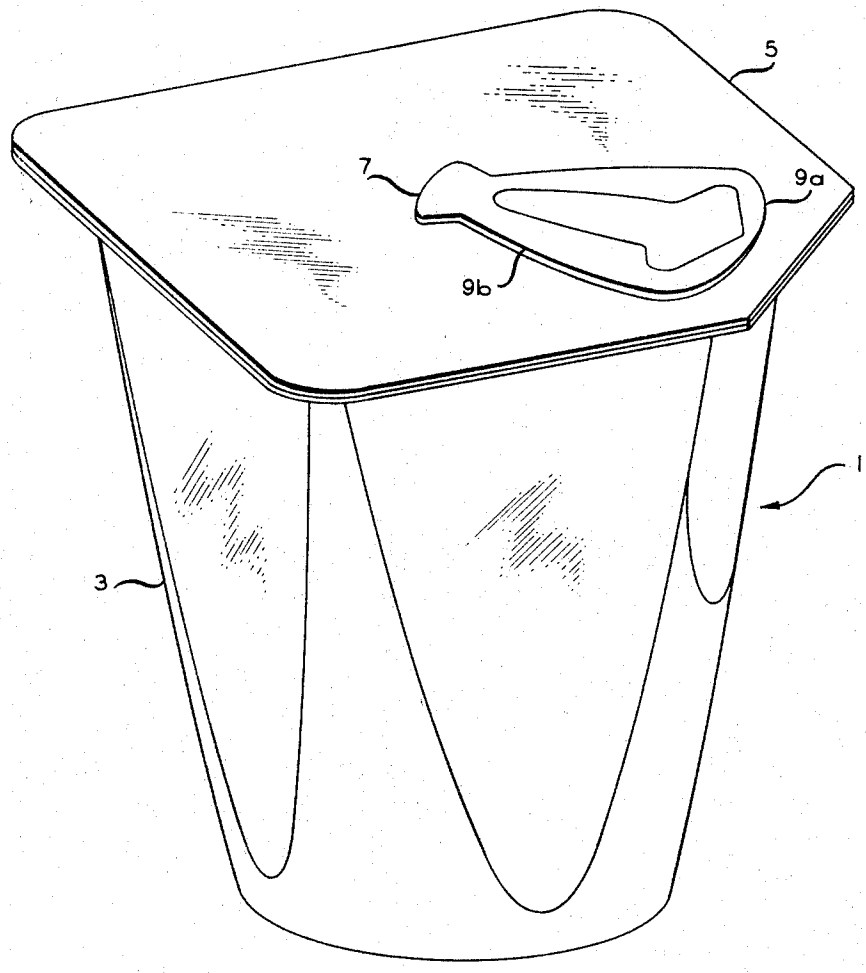

FIG. 1

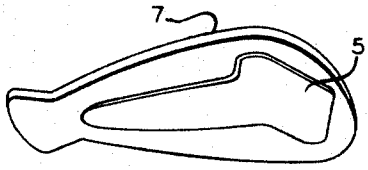

FIG. 4

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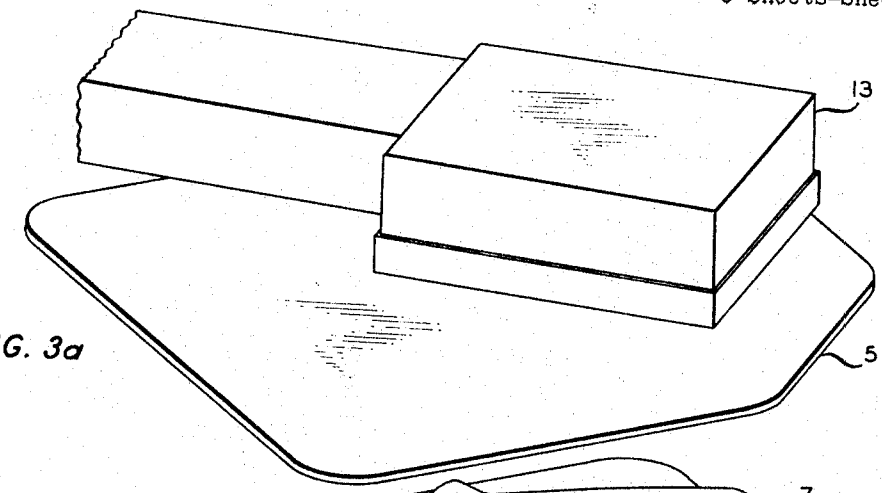

FIG. 3a

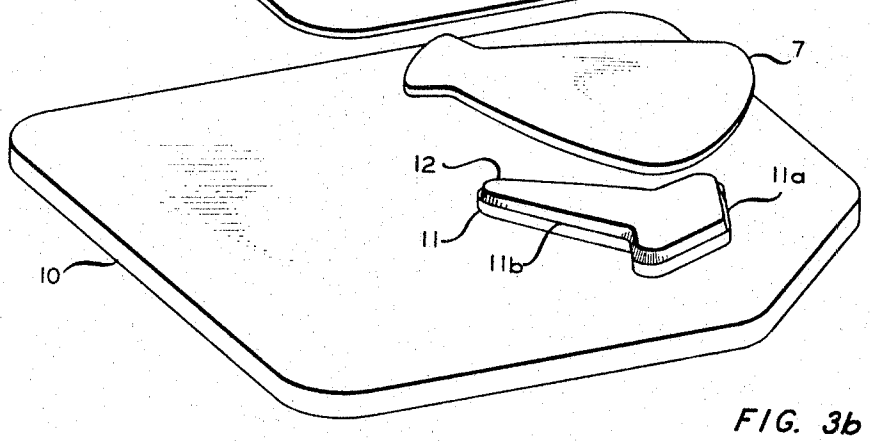

FIG. 3b

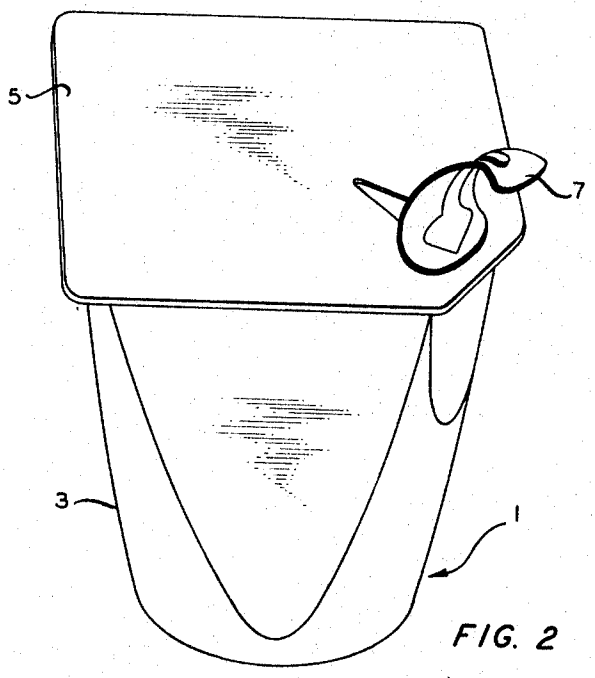

FIG. 2

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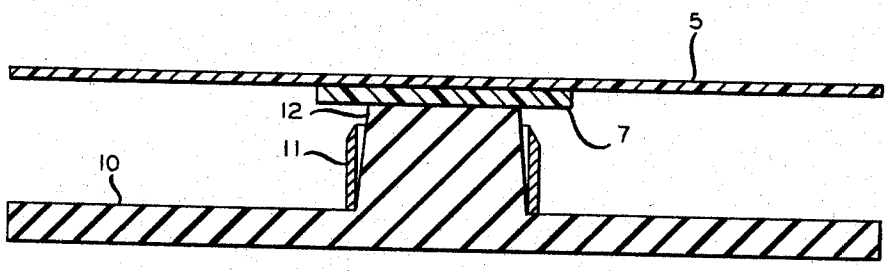

FIG. 3c

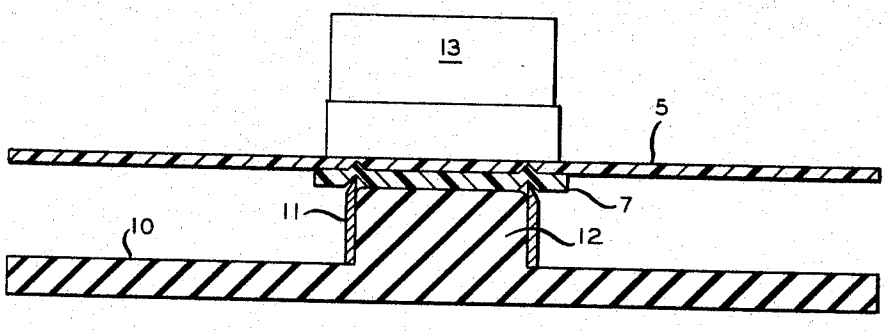

FIG. 3d

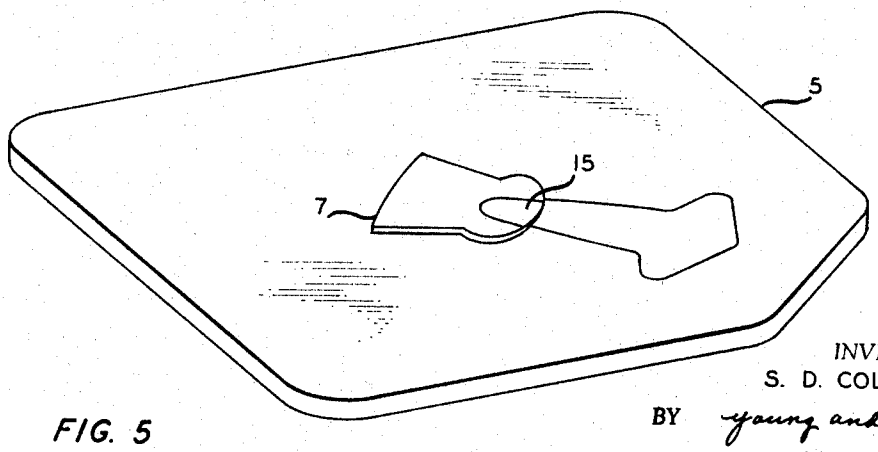

FIG. 5

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3,321,123

HEAT SEALED PULL TAB

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2 Claims. (Cl. 229—7)

The present invention relates to sealed thermoplastic containers. In one aspect it relates to those thermoplastic containers which can be opened to permit the removal of the contents without requiring the use of special implements. In another aspect, the invention relates to a heat-sealed pull tab which may be applied to the top of said container whereby the tab forms a shaped opening in the lid when it is peeled therefrom. In yet another aspect, the invention relates to thermoplastic containers which are opened by tearing a plastic pull tab material along a predetermined line or region without the need of any implement or tool. In yet another aspect this invention relates to a novel method for applying a pull tab to the lid of the container whereby the pull tab will form an opening in the lid when it is pulled or peeled therefrom.

In recent years there has been a trend toward the packaging of solid and liquid materials in thermoplastic containers. Such containers are more commercially desirable than those containers previously made from cardboard, paper, metal and the like in that they can be molded into attractive shapes. These thermoplastic containers are formed with the lid produced separately from the body of the container, and after the body of the container is filled with a particular type of liquid material, the plastic lid is then applied by known heat-sealing methods to the open end of the container. In order to provide access to the contents of the container, it was necessary to be able to punch a hole in the plastic lid. Pull or rip tabs have been extensively used in forming such holes in the tops of metal containers; however, when this means was employed for plastic containers, the prior art experienced considerable difficulty in its attempt to provide a satisfactory tab opener which effected a rupturing or tearing of a hole in the plastic lid rather than the tab itself. Moreover, the tab, although readily and conveniently removed merely by lifting or peeling it from the plastic lid, had to be sufficiently rugged to withstand the temperatures and treatment to which said merchandise would be subjected so as not to cause a leak in the container.

One of the objects of the present invention is to provide a novel pull tab opening means for thermoplastic containers which effects a rupturing or tearing of the hole in the plastic container rather than in the tab itself.

Another object is to provide a method of making a package or container of thermoplastic material embodying novel means for enabling a person to readily open the package.

Yet another object of the invention is to provide a method for applying a pull tab to a thermoplastic lid for a container whereby the pull tab fills a shaped opening in the lid of the container, thereby making it possible to maintain an hermetic seal within the container.

A further object of the invention is to provide a novel method of making a unique form of pull tab which is suitable for application to containers made from thermoplastic materials, and to provide such a method which can be used in conjunction with the application of the pull tab itself to the plastic container.

A further object of the invention is the provision of a novel heat-sealed pull tab for producing an opening in a plastic container lid positively and expeditiously which results in requiring the expenditure of a minimum of effort on the part of the user in lifting the tab and pulling the same off the container wall.

A still further object of the present invention is the provision of the a heat sealed pull tab which is made an integral part of a plastic lid portion of a container and the lid portion is sealed to the container with the pull tab attached thereto.

A still further object of the present invention is to provide a thermoplastic container having a seal, although readily and conveniently removed merely by lifting or peeling off the tab in the manner aforesaid, sufficiently rugged to withstand the temperatures and treatment to which such merchandise is ordinarily subjected

Other objects and many of the attendant advantage of this invention will be readily appreciated as the same become better understood by reference to the following detailed description which is considered in connection with the accompanying drawings wherein:

FIGURE 1 shows a diametric view of the container of the present invention as it would be merchandised;

FIGURE 2 shows a view similar to FIGURE 1 illustrating the removal of the pull tab from the lid of the container;

FIGURES 3*a* to 3*d* illustrate by way of example, the steps of the process of the subject invention in securing the pull tab to the lid of the container;

FIGURE 4 shows a diametric view of the underside of the pull tab after it has been removed from the lid;

FIGURE 5 shows a diametric view of the lid showing another embodiment in the method of securing the tab thereto.

This invention teaches a novel method for applying a pull tab to a plastic lid for a container in such a manner that the plastic in that portion of the lid immediately beneath the tab is structurally weakened so that it will adhere to the tab upon the tab being peeled or pulled from the top surface of the lid whereby an opening is conveniently formed in the top of the container.

The invention will be described hereinafter as applied to a bag or container having at least its lid portion consisting of thermoplastic material, but it will be understood by those skilled in the art that the pull tab of the invention can be applied to a wrapper for any object, regardless of size or shape.

More particularly in describing the invention, in FIGURE 1, is shown a container **1** comprising a body **3** and a lid **5**. The container may be made of any suitable flexible thermoplastic material, such as a vinyl plastic or polyethylene, or other polymeric, plastic material, or of a paper material coated with a flexible thermoplastic coating.

A thermoplastic pull tab **7** is sealed to the lid **5** with heat and pressure according to a process hereinafter described. Although the pull tab may take various shapes, the "key hole" shape represented in the drawings is preferred. The body of the pull tab is formed near the periphery of the lid with a curved edge **9***a* defining the face thereof, and an elongated edge **9***b* extending from this curved edge toward the center of the lid. This edge **9***b* facilitates the removal of the tab from the lid. The lid should be sufficiently flexible to permit the tab to be lifted away from the surface of the lid and to permit the tab to be peeled off; however, it is also desired that it have sufficient firmness and toughness to form a rigid cover for the container capable of withstanding really rugged handling.

One method which may be used for carrying out the invention is that described in FIGURES 3*a* through 3*d*, in which there is shown a rubber mat **10** having a raised nipple **12** integral therewith, the nipple is substantially of the same design as the opening in the lid **5**. A steel ruled die **11** in this preferred embodiment takes shape of a "key hole" having a sharp curved edge **11***a* defining the base thereof and an elongated edge **11***b* extending therefrom. This steel ruled die is then glued to the rubber mat in such a manner that the die surrounds the nipple causing it to

protrude above the edges of the steel die. The plastic tab **7** is then centered over the steel die and the topside of the plastic lid is then centered over the pull tab as shown in FIGURE 3.

A Teflon covered heating head **13** having a source of heat (not shown) is applied to the under side of the plastic lid **5**. This lid is then pressed down onto the rubber mat causing the rubber nipple which extends above the edges of the steel die, to become compressed thereby pushing the tab against the top side of the lid which has been weakened by the application of heat on its under side from the head **13**. This action of heat and pressure bonds the tab to the lid. At the same time the lid comes into contact with the sharp edges **11***a* and **11***b* of the die **11** which causes the plastic lid to be weakened structurally along the contour of these edges. As a result the bond between the tab and the lid is stronger than that portion of the plastic lid which comes into contact with the sharp edges of the aforesaid die. Another important feature of this invention is that the heat is applied to the under side of the lid. Thus even if the container lid and the tear tab are of the same material and of the same thickness, the lid, not the tab, will tear because it receives more heat and is preferentially softened. By varying the amount of heat and pressure, it is possible to control the amount of pull required to remove the tab from the lid. The more heat and pressure, the easier it becomes to remove the tab. The temperature applied depends on the melting point of the polymer; however, the temperature can be raised considerably if the time and pressure variables are reduced.

For example, a tab of 18 mils thickness was heat sealed to a lid of 13 mils thickness at a temperature of 250° F. with a pressure of approximately 100 pounds/square inch and a dwell time of 1½ seconds was suitable.

It is to be noted that the pull tab of the subject invention differs from the tear strip method of opening thermoplastic bags in that the tear strip must be of a heavier and stronger material than the bag itself whereas the effectiveness of the subject invention is dependent upon the heat and pressure, not the thickness of material used. It is possible to employ a tab being considerably lighter and weaker than the material from which the lid is made.

When the pull tab has been heat sealed to the lid as set forth hereinabove, the lid may be applied to the container according to conventional methods. When it is desired to open the container to provide access to the contents, the tab **7** is lifted away from the surface of the lid **5** along the edge **9***b* and then grasped with the fingers and peeled off.

The lid, having been previously weakened along a line which followed the contour of the edges of the die used in applying the tab to the lid, is fractured along this line so that as a result that portion of the lid sealed to the tab remains intact therewith and leaves an opening in the shape of a key on the lid. Because of the manner in which this tab was applied to the lid, its removal occurs cleanly without forming jagged edges around the key hole.

In another embodiment (see FIGURE 5) one end **15** of tab **7** is positioned over the nipple **12**. Heat and pressure are once more applied to the lid **5** as described hereinabove so that only the end **15** of the tab **7** is sealed to the lid. When this tab **7**, after being sealed in this manner, is pulled from the lid it will pull that portion of the lid which has been weakened by the heat and pressure through the combined action of die **11** and nipple **12** along with it, thereby creating an opening in the lid.

In the foregoing, the invention has been described with reference to a specific illustrative device and method. It will be evident, however, that modifications and variations, as well as the substitution of equivalent elements and steps of those described for illustration, may be made without departing from the broader scope and spirit of the invention as defined by the appended claims. Specification and drawing are to be regarded in an illustrative rather than a restrictive sense.

I claim:

1. The combination with a sealed container having at least a lid consisting of thermoplastic material, of a pull tab detachable container opening member, also consisting of thermoplastic material, said member being attached to a portion of the top surface of said lid, said portion having been sufficiently structurally weakened to produce an opening in the lid when the tab is removed therefrom.

2. The combination with a sealed container having a lid consisting of polyethylene material, of a key shaped pull tab detachable container opening member also consisting of polyethylene material, said member overlying a portion of the top surface of said lid, said portion having been structurally weakened along a line which follows the key shape of the tab whereby when the tab is pulled from the lid there is produced a severing of the plastic lid to produce a key shape opening in the container.

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