

Oct. 29, 1963

T. E. BETNER
SEALED PLASTIC CONTAINERS

3,108,708

Filed Nov. 10, 1959

2 Sheets-Sheet 1

Fig. 1

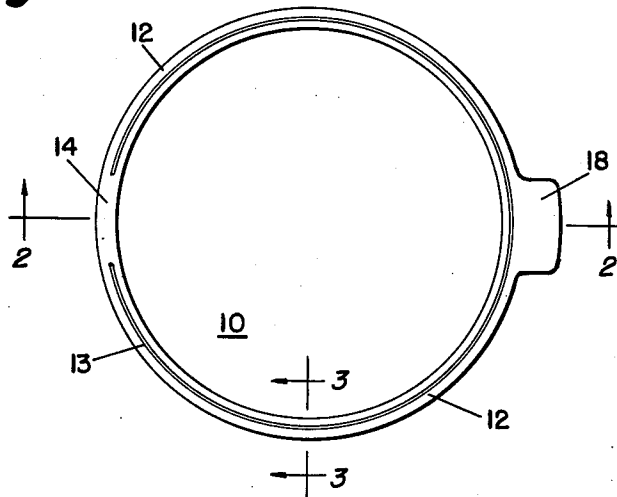


Fig. 2

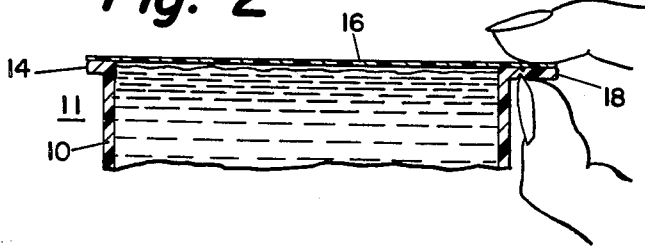


Fig. 3

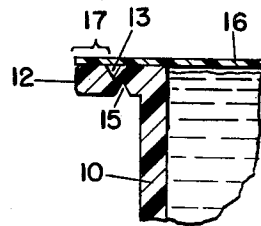
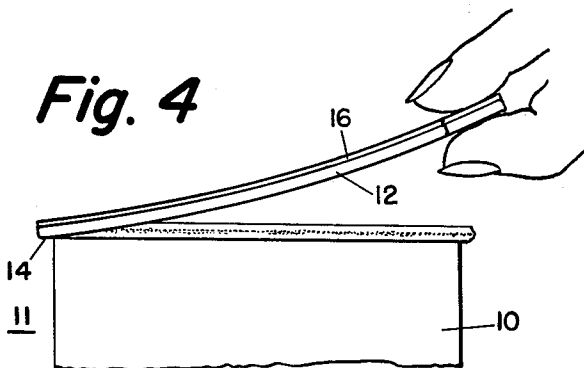


Fig. 4



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Fig. 5

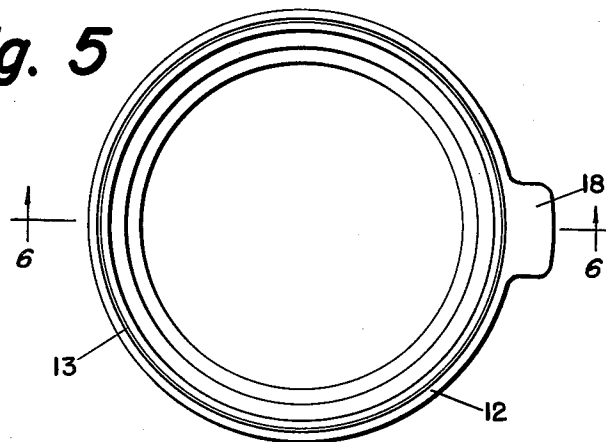


Fig. 6

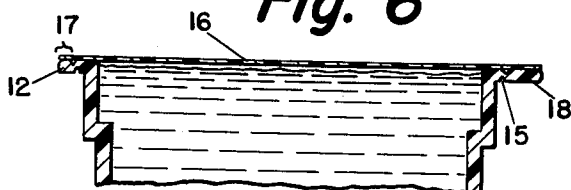


Fig. 7

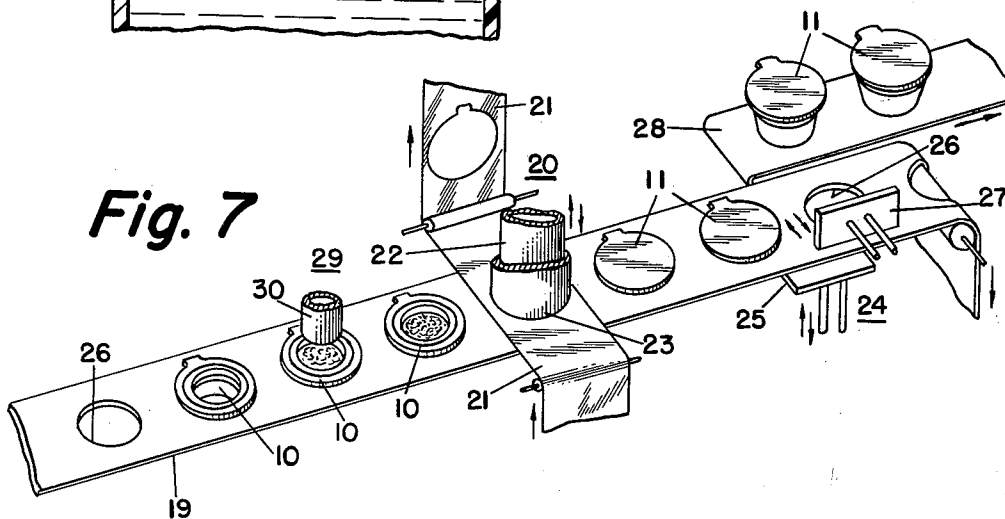
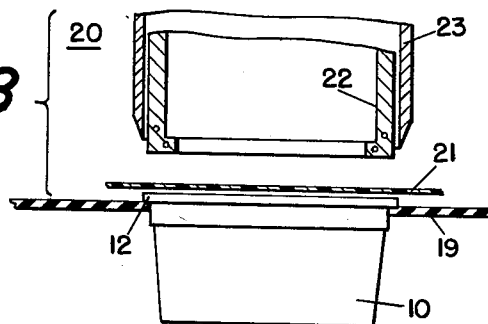


Fig. 8



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SEALED PLASTIC CONTAINERS

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3 Claims. (Cl. 220-54)

This invention relates to plastic containers having body and re-usable cover members which are sealed together for shipment and display.

In accordance with the present invention, the body of the container may be of relatively thick molded plastic and the cover of the container, during shipment and display, consists of a plastic film peripherally sealed to a flange integral with the container body and outwardly extending from the open end thereof. For initial access to the container contents, the flange is torn, wholly or in part, from the container body but remains attached throughout its peripheral length to the film and with it forms a re-usable lid or cover for the opened container. To insure that such tearing of the flange does not leave the opened container with an irregular, jagged upper edge, and to permit opening of the sealed container without use of any tool, even when the body is of tough plastic such as polypropylene or linear polyethylene, the upper face of the body flange is provided with a groove spaced inwardly from its outer edge to define a smooth inner boundary of the flange-to-film seal and which, together with an opposed groove in the lower face of the body flange, defines a path, clear of the seal, along which the flange smoothly tears from the upper portion of the container body.

More specifically, in some forms of the invention the flange grooves do not extend completely around the container body, so leaving an ungrooved flange section which, when the sealed container is opened, becomes an integral hinge for the captive cover formed by the film and the partially torn-off flange. In other forms of the invention, the opposed flange grooves extend completely around the container body so that the body flange becomes wholly detached from the container body and together with the plastic film forms a free lid for the opened container.

The invention further resides in sealed plastic containers having features of novelty and utility hereinafter described and claimed.

For a more complete understanding of the invention, reference is made in the following description of various embodiments thereof to the attached drawings in which:

FIG. 1 is a top plan view of a flanged container body;

FIG. 2 is a fragmentary side elevational view in section taken on line 2-2 of FIG. 1 with the cover film applied;

FIG. 3, on enlarged scale, is a fragmentary side elevational view taken on line 3-3 of FIG. 1 with the cover film applied;

FIG. 4 is a fragmentary side elevational view showing the opened container with its captive cover;

FIG. 5 is a top plan view of another form of flanged container body;

FIG. 6 is a fragmentary side elevational view in section taken on line 6-6 of FIG. 5 with cover film applied;

FIG. 7 illustrates a method and apparatus of making sealed containers such as shown in FIGS. 2 and 6; and

FIG. 8, on enlarged scale and in section, illustrates a station of FIG. 7.

Referring to FIGS. 1 to 4, the body 10 of the container 11 may be formed, as by molding, from heat-sealing plastic material, such as polyethylene, polypropylene or the like. An integral flange 12 extends outwardly from the open end of the body as in some of the containers shown in my earlier Patents Nos. 2,837,236 and 2,887,244. The upper face of flange 12 is here however provided with

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a V-groove 13 spaced inwardly from the free edge of the flange and extending parallel thereto continuously throughout a major part of the body perimeter leaving an ungrooved flange segment 14. The lower face of the body flange 12 is also provided with a V-groove 15 similarly spaced from the outer edge of the flange and of extent corresponding with that of groove 13 in the upper face or continuing across the segment 14.

After the container body is filled with its intended contents, a heat-sealing film cover 16 is applied over the open end of the container body and peripherally sealed thereto by application of heat and pressure. Suitable heat-sealing films include polyethylene, coated cellophane and polypropylene.

Throughout the grooved portion of the flange, the inner boundary of the peripheral seal 17 between the body flange 12 and the film cover 16 is defined by groove 13 in the upper face of the flange (FIG. 3). Thus, even though the sealing pressure should be unevenly distributed, or if for any other reason the flange be unevenly compressed during the sealing operation, the heat-seal 17 cannot at any point extend inwardly beyond the tear line defined by the bases of the opposed grooves 13, 15. It is thus insured that the upper edge and rim of the opened container body will be smooth and clean when the flange is torn off as later described. At the hinge area of flange 12, the peripheral seal may be of the same width as throughout the rest of the peripheral sealing area, or it may be made of greater width by suitable dimensioning of the heat-sealing die. Any irregularities in the inner boundary of the seal within the limits of the hinge segment 14 of the body flange and the film cover 16 are not of consequence.

For initial access to the contents of the sealed container, the flange 12 is torn from the container body to the extent controlled by the opposed grooves 13, 15 and cleanly along the tear-line jointly defined by them. The plastic cover film remains sealed to the torn-off section of the body flange and to the hinge segment remaining attached to the body. There is no tear transversely of the torn-off portion of the flange or of the film 16. The torn-off flange thus serves as an unbroken rim for the film and with it serves as a re-usable hinged cover for the open container.

To facilitate such tearing of the flange for initial access to the container contents, the flange 12 is provided with an integral outwardly extending tab section 18. As shown in FIG. 1, the tab is on the side of the container body which is opposite to the ungrooved hinge segment 14 of the body flange.

To open the sealed container, the tab 18 may be gripped between the thumb and finger as indicated in FIG. 2. Upon bending of the tab so gripped, the flange is locally broken at the bases of the opposed grooves 13, 15. As the tab is lifted, this break progressively extends in both directions toward the hinge segments as a smooth tear so that the body flange and attached film now form a hinged cover (FIG. 4). During lifting of the tab, the torn-off part of the flange is free temporarily to deform, without any appreciable restraint by the cover film, so that the applied tearing force is concentrated at the tearing points at the bases of the opposed V-notches 13, 15 of the as yet untorn portions of the flange.

The container above described has many advantages of significance to the manufacturer, to the merchant, and to the ultimate user. Since the container consists only of a plastic body and a piece of plastic film, it is very inexpensive and economically suitable for an extended range of inexpensive products, such as fruit juices and the like. Since the plastic body and plastic cover film are chemically inert to foodstuffs, pharmaceuticals and the like, they are not contaminated by contact with the container ma-

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terial itself. Also since the cover film and body flange are heat-sealed to each other, the use of adhesives with consequent likelihood of contamination of the container contents is avoided. The cover 16 may be of transparent film for inspection and display of the contents of the sealed container. The cover film may have printing thereon identifying the product and/or the product-source and at cost substantially lower than with printed molded covers: the cover film may also have a tear-off coupon extending beyond the container body and bearing advertising, recipes or the like. Using film material of the usual heat-sealing types, the container is hermetically sealed by the cover film as sealed to the body flange. When the container contents are of nature requiring that the sealed container be able to "breathe," such characteristic can be attained by use of film which has been irradiated or otherwise treated to obtain microporosity permitting passage of gas but precluding passage of moisture. The opposed grooves in the body flange with the film cover peripherally heat-sealed to the body flange outwardly of the grooves permits the housewife, for example, to open the sealed container without use of a knife or other tool and insures that the upper edge of the opened container will be smooth and clean of torn film. The reusable cover jointly formed by the original body flange and the cover sealed thereto is a captive cover whose hinge is formed by segment 14 of the original body flange and the overlying sealed film. The opened container may thus be used for covered storage of its partly depleted original contents.

If for any reason a free lid instead of a hinged lid is desired, the opposed grooves 13, 15 in the upper and lower faces of the body flange are both extended, as shown in FIG. 5, completely around the body of the container. In this case, the flange-to-cover seal, as extending completely around the container, has its inner boundary defined by the upper groove 13 throughout the peripheral length of the body flange. As a sealed container, the type container shown in FIG. 6 has all of the advantages of the container previously herein described.

When tearing along the grooves 13, 15 is completed for initial access to the contents of the container of FIG. 6, the entire body flange is removed as an unbroken ring together with the adherent film cover which protected the container contents during shipment, storage and display. The original body flange now serves as a peripherally continuous stiffening ring for the otherwise useless film cover so that the cover film and the adherent body flange can now be used as a free-lid type of cover for the opened container. The gripping power of the re-usable lids may be enhanced by making the lower V-groove of slightly smaller radius than the upper V-groove 13 and/or by making at least one of the grooves with small serrations.

Although precut film covers can be applied and heat-sealed about their peripheries to the individual containers of FIG. 2 or FIG. 6, there are cover-feeding and cover-registration problems in high-speed production which are avoided by the method and apparatus now described. Such method is described and claimed in my copending divisional application Serial No. 248,779, filed Dec. 31, 1962.

Referring to FIG. 7, the filled containers are in succession fed, as by an intermittently operated conveyor 19, to a sealing station 20 to which is also intermittently fed a continuous web 21 of plastic film. While the web and conveyor are at rest, a heat-sealing die 22 descends to press the web into contact with the upper face of the body flange 12 of the sealed container then in register at the sealing station. The lower sealing face of die 22 of course corresponds in shape and dimensions with the heat-seal to be effected between the cover film and the body flange. The inner edge of the sealing face of die 22 is in substantial register with the outer edge of groove 13 in the upper face of the body flange and the outer edge of that sealing face is in substantial register with the outer edge of the body flange, following the contour of

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the tab 18 when provided. During or after formation of the heat-seal between the outer peripheral area of the body flange and the web, the cutting die 23 descends to sever from the web 21 that portion of it now forming the film cover 16 of the container.

When the dies 22, 23 have been moved upwardly to clear the path of the now sealed container, the endless conveyor 19 is stepped to move the sealed container away from sealing station 20 and toward the transfer station 24. By this same step, the next container is advanced by conveyor 19 to the sealing station. The web 21 is also advanced a step to bring an uncut area thereof beneath the dies 22, 23 which thereupon are actuated as above described to form another sealed container.

Each sealed container in turn arrives at the transfer station 24 at which the vertically reciprocable member 25 lifts a sealed container out of a corresponding pocket 26 of the conveyor 19. A horizontally reciprocable member 27 pushes the lifted container off of conveyor 19 and preferably onto a second endless conveyor 28 which may operate continuously to feed a stream of sealed containers to a packing station—not shown.

As indicated in FIG. 7, empty container bodies 10 may be placed on conveyor 19 suitably in advance of the sealing station 20. As each in turn arrives at a filling station 29, it receives a measured quantity of the intended contents as delivered thereto, for example, by the discharge pipe 30 or equivalent of an associated filling machine—not shown.

The container bodies as deposited on conveyor 19 or equivalent may each have its flange 12 molded or precut to provide the integral tab 18 as shown in FIGS. 1 or 5. In such case, the container body must be properly oriented on the conveyor so that the tab will not be cut off by die 23 at the sealing station. Preferably and to avoid such need for orientation, the container bodies may be molded with the flange 12 having throughout its peripheral length a width slightly greater than the width of tab 18 as measured from the outside of the tab to the inside of the container. The die 23 at the sealing station is now effective not only to cut a film cover from the web but also simultaneously to trim the body flange to size and to provide it with a tab 18.

The containers need not be of circular cross section as shown, but may be rectangular or any other desired shape or outline. It shall be understood that this and other modifications of the structures shown may be made within the scope of the appended claims.

What is claimed is:

1. A container comprising a body member having an integral flange surrounding said body member and extending outwardly from the open end thereof, the upper and lower faces of said flange each having a groove therein spaced inwardly from the outer edge of said flange and extending substantially completely around said body member with said groove in said lower face being spaced slightly farther inwardly from said edge than said groove in said upper face whereby said grooves are substantially opposed but are slightly offset one from the other, and means for covering the open end of said body member during shipment and display consisting solely of a plastic film member peripherally heat-sealed only to the upper face of said flange outwardly from the groove therein, said offset grooves defining a path along which the portion of said flange located outwardly of said path may be torn from the remainder of said body member to permit direct initial access to the contents of the container and to form an unbroken stiffening rim for said film member sealed thereto to provide a free lid-cover adapted to be replaced in gripping relationship relative to the opened container so as to form a cover therefor.

2. A container comprising a body member having an integral flange surrounding said body member and extending outwardly from the open end thereof, the upper and lower faces of said flange each having a groove

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therein spaced inwardly from the outer edge of said flange and extending a major portion of the distance around said body member leaving a segment in said flange from which at least one of said grooves is absent, said groove in said lower face being spaced slightly farther inwardly from said edge than said groove in said upper face whereby said grooves are substantially opposed but slightly offset one from the other, and means for covering the open end of said body member during shipment and display consisting solely of a plastic film member peripherally heat-sealed only to the upper face of said body flange outwardly from the groove therein, said offset grooves defining a path along which the portion of said flange located outwardly of said path except for said segment thereof may be smoothly torn from the remainder of said body member without restraint by said film member to permit direct initial access to the container and to form an unbroken stiffening rim for said film member sealed thereto to provide a captive hinged cover capable of gripping and reclosing said container.

3. A container comprising a heat sealable plastic body member having an integral flange surrounding said body member and extending outwardly from the open end thereof, the upper and lower faces of said flange each having a groove therein spaced inwardly from the outer edge of said flange and extending substantially completely

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around said body member with the inner portion of said groove in said lower face adjacent the inner portion of said groove in said upper face whereby said grooves are substantially opposed, and means for covering the open end of said body member during shipment and display consisting solely of a heat sealable plastic film member peripherally heat-sealed only to the upper face of said flange outwardly from the groove therein, said grooves defining a path along which the portion of said flange located outwardly of said path may be torn from the remainder of said body member to permit direct initial access to the contents of the container and to form an unbroken stiffening rim for said film member sealed thereto to provide a free lid-cover adapted to be replaced in gripping relationship relative to the opened container so as to form a cover therefor.

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