PROCESS OF PACKAGING AND PACKAGING STRUCTURE

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PROCESS OF PACKAGING AND PACKAGING STRUCTURE
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This invention relates generally to a structure for and a process of plastic packaging of merchandise, but more specifically to plastic package parts comprised of a reinforced vessel or reinforced container portion and a cover therefor both capable of being permanently sealed subsequent to a merchantable-filling operation and further capable of being easily separated or separated by the consumer for further functioning as a container and a sealably detachable cover therefor.

A primary object of the invention resides in the provision of a mercantile-receiving vessel reinforced at the rim portion for both maintenance of shape and handle provision therefor and for both integrally or adhesively and frictionally receiving a flange of a cover member so that the combination when integrally or adhesively joined serves as a durable (and if desired, vacuum packed) package for the vessel contents for transportation by carriers; and when the combination is partially or fully severed at the normally permanent seal by the consumer, the package parts serve as a durable reinforced container having a rim grasping means and a sealing type of detachable cover therefor.

For better functioning and efficiency, the container and cover utilizes a thermoplastic type of material. Specific characteristics such as flexibility, local deformability and softness for cutting, tearing and scoring add to the advantages of the invention. In addition, the material should further be non-absorptive to and not readily wetted by water, odorless, resistant to acids, alkalies, solvents and other chemicals at ordinary temperatures. Moreover, the material should not soften far below the boiling point of water, be resistant to mildews, micro-organisms and insects and be unaffected by blows and shocks.

Polyethylene has been found to be a plastic polymer which has all the above characteristics but it is understood that other suitable plastic materials suitably formed may also be used such as the vinyls, polystyrene and the like.

The packaging and use of the container and cover herein may be used in various capacities for packaging (under vacuum if desired) alcoholic liquids, foods, carbonated beverages, milk and derivative products, cheese, candies, drugs, industrial, commercial and other products such as metals, chemicals, poisonous materials, nails, bolts etc.

A further object of the invention resides in the provision of a package wherein the normally permanent connection of the members including heat-sealing is disposed on cooperating flanges or beads between the container and cover members, the flanges being of sufficient dimensions as to retain their respective sealing and gripping functions after partial or full severance of the heat-sealing areas.

Another object of the invention resides in the provision of a form of packaging of commercial, industrial and consumer products which is strong, durable, resistant to wear and tear, shocks of handling and impact, electrically non-conductive and capable of further and indefinite reusability after the heat-sealing or non-frictionally joined areas have been excised either by simple knife cutting, or removed by pulling along scored lines, or separated by a tear string or wire and a knife edge or point.

Another object of the invention resides in the economy effected in the packaging of industrial, commercial and consumer goods by the filling plant or filling-operator for direct shipping and immediate accessibility to the contents by breaking the heat-seal or permanent connection adjacent frictionally engaging portions and utilizing the package as a container and a sealably removable cover.

These objects and other incidental ends and advantages of the invention will hereinafter appear in the progress of the disclosure and as pointed out in the appended claims.

Accompanying this specification are drawings showing preferred forms of the invention wherein:

Figure 1 is a view in perspective partially in section showing a package of contents and consisting of a container and cover heat-sealed between cooperating parts and further showing sliding means in process of severing the heat-sealed areas.

Figure 2 is an enlarged sectional view of Figure 1 across the plane 2—2 thereof.

Figure 3 is a view in perspective of a modified form of the invention wherein the heat-sealing areas on the package are discontinuous or spotted and further showing cutting means in process of severing the heat-sealed areas.

Figure 4 is a partial view in perspective showing another form of the invention wherein the sealing areas are at tab parts and further showing cutting means in phantom in process of severing the heat-sealed areas.

Figure 4e is a smaller view in perspective of the package shown in Figure 4 wherein all sealing tabs except one are severed to permit a hinge attachment between the cover and the container of the package.

Figure 5 is a view in perspective showing a modified package wherein heat-sealing is disposed between the cover and the container members and wherein tearing facilities are provided.

Figure 6 is a partial view in perspective showing the process of removing the heat-sealed portion of the package shown in Figure 5.

Figure 7 is an enlarged sectional view of Figure 5 across the plane 7—7 thereof.

Figure 8 is a view in perspective showing a modified form of package having a draw string type of means embedded adjacent the sealing area between the container and cover members for splitting thereof.

Figure 9 is an enlarged sectional view of Figure 8 across the plane 9—9 thereof.

Figure 10 is an enlarged sectional view of Figure 8 across the plane 10—10 thereof.

Figure 11 is a view in perspective showing a modified package wherein the container and cover members are adapted to engage each other in telescopic disposition and further showing heat-sealing means and additional reinforcement and handle provision of the container.

Figure 12 is an enlarged sectional view of Figure 11 across the plane 12—12 thereof.

Figure 13 is a reduced fragmentary view in cross-section showing the sealing flange of the container as a continuation with the edge thereof.

Figure 14 is a reduced fragmentary view in cross-section showing the sealing flange of the container as a continuation with the edge and having therebelow a reinforcing bead.

In the embodiment of the invention shown in Figures 1 and 2, numeral 10 indicates the side wall of a vessel or container of any desirable shape and is provided with a top peripheral edge 11 and a continuous outer flange 12 spaced below edge 11. As shown, the side wall of vessel 10 is rounded and outwardly tapered from the bottom, but it is understood that the necessity of the taper
and the size and perimetric shape are selective only. Furthermore flange 12 as shown is horizontally disposed and is of predetermined width for a purpose hereinafter described and terminating in edge 12'. This vessel generally indicated by letter A and together with a fitting and cooperating cover is furnished by the package manufacturer to the filling plant or filling operator and the latter determines requirements as to gauge, size, capacity and shape. The filling plant or filling operator employs the usual facilities for filling vessel A with contents such as food, pharmaceuticals, or other types of products capable of being packaged for consumption by other manufacturers, dealers, distributors, consumers and the like.

Flange 12 of vessel 10 is multi-functional both in connection with vessel rim 11' and in connection with a cover member generally designated by letter B. Thus, flange 12 by virtue of its annular disposition serves as a reinforcing bead for vessel rim 11' arresting easy deformability and adding rigidity thereto. Moreover, flange 12 serves as a handling element when vessel 10 is used by itself as a container and as a handle. Flange 12 is further utilized in the invention herein by cooperation with a similar continuous flange 13 on the cover member B. Flange 13 is adapted to superpose flange 12 thereby adding further rigidity to vessel rim 11', adding frictionally effected and contacting sealing area between cover B and vessel A when capacity and engagement and affording permanent sealing area between the flanges 12 and 13 as will hereinafter appear. Flanges 12 and 13 are formed extra wide so that following removal of the permanent sealing portions thereafter, sufficient flange width remains for proper functioning of the package as a container and removable and sealable cover therefor.

Thus, cover B has an engaging side wall 14 telescoping over vessel rim 11' for sealable closure purposes while flange 13 extending outwardly from said wall 14 engages on the underside thereof the upper surface of vessel flange 12 for additional sealable closure purposes.

The permanent and severable sealing areas shown in Figures 1 and 2 of flanges 12 and 13 are adjacent the outer rim thereof. Thus, cover flange 13 as shown terminates in a downwardly turned flange 15 concealing vessel flange edge 12' and the permanent sealing area between flanges 12 and 13 is preferably at the region inside of edge 12 indicated by numeral 16. This permanent sealing area 16 may be continuous with the periphery of the vessel or discontinuous and may be provided with flange extensions as shown and described hereinafter.

With the package shown in Figures 1 and 2, after vessel A is filled with required merchandise and cover B applied, the filling agent applies conventional permanent sealing apparatus to abutting flanges 12 and 13 at a predetermined anular area, fusion or connection being indicated at 16, and at the same time may engrave a scoring mark 17 on the upper surface of cover flange 13.

This apparatus is preferably heat-sealing means which causes an integration of the thermoplastic material of which the vessel and cooperating cover are made such as polyethylene. However, suitable solvents may be used between the contacting surfaces of flanges 12 and 13 applied at required areas. There may also be a pressure sensitive sealing compound between the flanges for permanent integration with and without spot welding or heat sealing means.

Thus, a package with contents therein and having the attributes hereinbefore mentioned is formed wherein the cover is permanently affixed thereto. This package is ready for shipment by any type of carrier anywhere or may be used for storage purposes either under refrigeration or otherwise.

The permanent sealing of the package is severed when removal of the contents is necessary and for this purpose an ordinary knife may be used to slice off the edge portion of flanges 12 and 13 along score and dotted line 17 as shown in Figures 1 and 2. Thereafter, the cover B may be removed by separating the portion of the remaining cover flange 13e from the remaining vessel flange 12a and thereafter peeling off the cover 13a as indicated generally by letter G and H shown wherein flanges 12a and 13a respectively continue to serve several functions mentioned. Thus, flange 12a serves as a reenforcement and handle for vessel A and also as an additional sealing area with flange 13a when the cover is applied.

Cover B with its telescoping side 14 for vessel rim 11' and as shown in Figures 1 and 2 is provided with a central wall 18. Of course any type of cover provided with an outwardly extending flange 15 is feasible in the invention herein, but the cover as shown in Figures 1 and 2 is similar to that shown in applicant's U.S. Patent No. 2,487,400, dated November 8, 1949.

In Figures 1 and 2, the central wall 18 has an upwardly extending and inverted grooved rim wherein the telescoping wall 14 serves as the outer wall thereof while an inner wall 19 and 20 is utilized as a cover B and wall 20 are provided. With this form of cover, the diameter of the outer surface of the vessel rim 11' is larger than the diameter of the inner surface of the cover rim 14 whereby a live seal is effected therebetween.

In the modifications of the embodiment of the invention herein set forth, similar features to those shown in Figures 1 and 2 are indicated by the same reference characters.

In the modification shown in Figure 3, a vessel generally indicated by letter C and a cover member thereof generally indicated by letter D are shown wherein the vessel and cover flanges are permanently sealed at discontinuous areas. Thus, the vessel and cover flanges 12 and 13 are provided with spaced cut-out areas each indicated generally by numeral 21, said areas having a crescent type of score line 22 on the cover flange 13 to serve as a guide for severing the sealed areas therein respectively indicated by numeral 23 and disposed between the vessel flange 12 and the cover flange 13. As shown in Figure 3 the portions 21 are severed by any means such as a pen knife, and the discarded tabs indicated by numeral 24. On the other hand a knife point can be inserted between the vessel and cover flanges adjacent the sealed areas for cutting the joints.

In the modification shown in Figure 4 vessel C' and cover D' have respective narrower flanges 25 and 15a thereof even be provided with a local flange generally indicated by numeral 25, the flange 15a having around the perimeter thereof a downwardly extending flange 26. There are provided scoring or cut-out score marks 27 with heat-sealing areas 28 between the flanges. In Figure 4a is shown a hinged relationship between cover D' and vessel C' by retaining a tab projection and severing the remaining ones.

In the embodiment of the invention shown in Figures 5, 6 and 7 vessel E is shown having a cover F wherein a different manner of severance of the permanent seal between the vessel and vessel of the package is shown. Thus, aligned scoring marks 29 and 30 are provided on flanges 13 and 12, flange 13 being also provided with a tab 31 having an outer score line 32 as shown in Figure 5. Figure 6 shows the tab as grasped and displaced by the finger and pulled. The outer portion beyond the marks 29 and 30 of flanges 13 and 12 are easily peeled off along the score lines 29 and 30 for severance of the seal and discarding of the removed flange portions.

In the embodiment of the invention shown in Figures 8, 9 and 10 a polygonal-shaped vessel and correspondingly shaped cover indicated generally respectively by letters G and H are shown wherein a string draw-type means is utilized for severing the permanent seal between the vessel and cover flanges.

Thus, a string 33 made of any suitable material such as metal, composition, fiber or other relatively non-fusible
material 33 is embedded between the cover flange 13 and the vessel flange 12 inside of the permanent sealing area, having an end 34 protruding from the edges of the flanges. To sever the permanent sealing between cover H and vessel G, it is merely necessary to draw the end of string 34 as shown in Figure 10 thereby separating the flanges at the location of the periphery. It is to be noted that in Figures 8–10 the cover flange 13 does not have a downwardly extending flange such as 15 shown in the other embodiments to permit string end 34 to project between the flange contacting surfaces.

In the embodiment of the invention shown in Figures 11 and 12, a vessel generally indicated by letter J is shown having a cover generally indicated by letter I. In this embodiment of the invention a series of spaced vertical ribs 35 are disposed between the undersurface of flange 12 and side wall 10 provided to reinforce the flange 12 and further to act as hand gripping means for the vessel. Moreover, cover I differs from the other covers shown herein in that there is no grooved and upstanding rim, the top wall and rim or side wall being indicated by numerals 36 and 37 respectively. For a live seal, the inner diameter of side wall 37 is less than the outer diameter of the rim 11 for sealably engageable purposes therebetween.

It is to be observed that the invention herein has its application to vessels and covers of various corresponding shapes, and further lends itself to continuous and spotted or discontinuous sealing areas. The invention further has application to heat sealing as well as solvent and adhesive sealing. Moreover, although various severing means to break the permanent seal have been shown, such means are not restrictive. Furthermore, it has been shown that after the permanent seal has been broken, it is possible for the cover of the vessel to be entirely removable therefrom or to be hingedly connected thereto by retaining one or more sealed areas as indicated in Figure 4a.

Permanent sealing areas as mentioned may be continuous or spotted, but it is to be remembered that where sealing is not continuous, full hermetic sealing protection of the contents is furnished to the extent afforded by the efficient frictional and live engagement between the cover and the vessel.

The process of packaging and the structure described maintains the contents in substantial air and water proof condition both before the breaking of the seal and thereafter and insures freedom from spoilage and breakage during shipment by a carrier and while in storage under refrigeration or otherwise. Even shocks and vibrations are absorbable by the package and crowded quarters will not cause cracks and tears because the package can even be compressed somewhat by virtue of the deformable characteristics from which it is made. The rigidity afforded by the reinforcement of the vessel at the rim portion by flanges 12 and 13 permits a thinner gauge required for storing and shipping purposes thereby lessening weight and offering economies. In packing the contents, a partial vacuum can be effected by the expedient of displacing air within the vessel portion preparatory to closing the cover by a squeezing action on the vessel body below flange 12.

Although it is preferable to utilize the same material as respects gauge and physical and chemical characteristics in the formation of both cover and vessel, it is understood that slight variations to suit requirements and economies may also be used. Both the vessel and cover may be formed by any of the known methods in use and the manner of the production thereof in newness affects the invention herein. Some of such methods are injection, compression and blow molding and vacuum forming means.

In Figure 13 is shown a container M having a downwardly extending bend 38 at the upper edge and continuing in an L-shaped flange 39–40. A cover 41 having a downwardly extending flange 43 is adapted to frictionally and fuseably sealably engage container M at flange walls 39 and 40 respectively, the fusion or sealing peripheral or spotted areas being indicated at numeral 44.

In Figure 14 is shown a container K having a curved and outwardly extending flange 45 against which bears the cover flange 46. A peripheral bead 47 is provided adjacent the edge of container K and below flange 45 so that after the seal 48 is broken, a bead remains on the container toleave an appearance thereto and a stiffened lip that is smooth or rounded at parts to yield more comfort to the lips of the user.

It is understood that the above forms of the invention apply to square and round or other shaped containers including household items such as plates, cereal dishes, creamers, sugar bowls, tumblers etc.

It is distinctly understood that minor changes and variations in the steps utilized in the process herein, and in the material, integration, location, arrangement and size of parts may all be resorted to for practicing the invention without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. A package comprising a flexible heat sealable open ended hollow body, said body having an integral, peripheral flange projecting outwardly therefrom adjacent and paralleling the edge of its open end, said flange closing the opening in the body and having a depending portion snugly embracing that part of the body extending between said flange and said open end and carrying in operative position an integral outwardly projecting flexible flange which lies in face to face contact with the flange of the body and with their free edges substantially coinciding, the peripheral free edge portions of said flanges being fused together, said fused portion being in outwardly spaced relation to the body of the container and having a peripheral tear line traversing the unfused portion of the flanges inwardly of the fused edge portion whereby said fused edge portion functions as a tear strip in opening the package.

2. A package comprising a flexible heat sealable open ended hollow body, said body having an integral, peripheral flange projecting outwardly therefrom adjacent and paralleling the edge of its open end, a heat sealable lid closing the opening in the body and having a depending portion snugly embracing that part of the body extending between said flange and said open end and carrying in operative position an integral outwardly projecting flexible flange which lies in face to face contact with the flange of the body and with their free edges substantially coinciding, the peripheral free edge portions of said flanges being fused together, said fused portion being in outwardly spaced relation to the body of the container and having a peripheral tear line traversing the unfused portion of at least one of the flanges inwardly of the fused edge portion whereby said fused edge portion functions as a tearing strip in opening the package.

3. A package comprising a flexible heat sealable open ended hollow body, said body having an integral, peripheral flange projecting outwardly therefrom adjacent and paralleling the edge of its open end, a heat sealable lid having a groove on the periphery engaging said edge and thereby closing the opening in the body and having a depending portion snugly embracing that part of the body extending between said flange and said open end and carrying in operative position an integral outwardly projecting flexible flange which lies in face to face contact with the flange of the body and with their free edges substantially coinciding, the peripheral free edge portions of said flanges being fused together, said fused portion being in outwardly spaced relation to the body of the container and having a peripheral tear line traversing the unfused portion of the flanges inwardly of the fused edge portion whereby said fused edge portion functions as a tear strip in opening the package.

4. A package comprising a plastic and heat sealable open ended body, said body having an integral, periph-
eral flange projecting outwardly therefrom adjacent and paralleling the edge of its open end, a heat sealable lid closing the opening in the body and having a depending portion snugly embracing that part of the body extending between said flange and said open end and carry 5 ing in operative position an integral outwardly projecting flange which lies in face to face contact with the flange of the body and with their free edges substantially coinciding, both of said flanges at the free edges being fused together, said fused portion being in outwardly spaced relation to the body of the container and having means traversing the unfused portions of the flanges inwardly of the fused edge portion for opening the package.

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