

[54] RESEALABLE CONTAINER

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Related U.S. Application Data

[63] Continuation of Ser. No. 750,111, Aug. 5, 1968, abandoned, which is a continuation-in-part of Ser. No. 639,213, May 17, 1967, Pat. No. 3,454,158.
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[51] Int. Cl. B65d 17/00, B65d 85/76
[58] Field of Search 206/46 F, 46 M, 45.34, 65 S, 206/56 AA, 63.2, DIG. 18; 229/51 RC, 51 WB, 43, 3.5; 156/224, 230; 161/406; 99/171 R, 174

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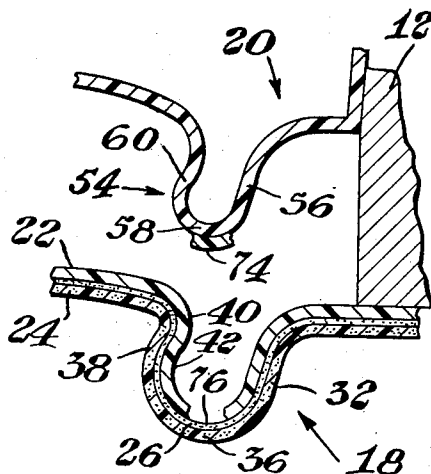
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[57]

ABSTRACT

A resealable container including a hermetic seal joining together components of the container and which seal is so constructed that when broken, a pressure sensitive adhesive layer is exposed to provide a tacky surface for resealing purposes. Specifically, one of the components is a laminate. The seal causes a preferential separation of the plies of the laminated component with the adhesive layer being located at the interface of preferential separation.

16 Claims, 3 Drawing Figures



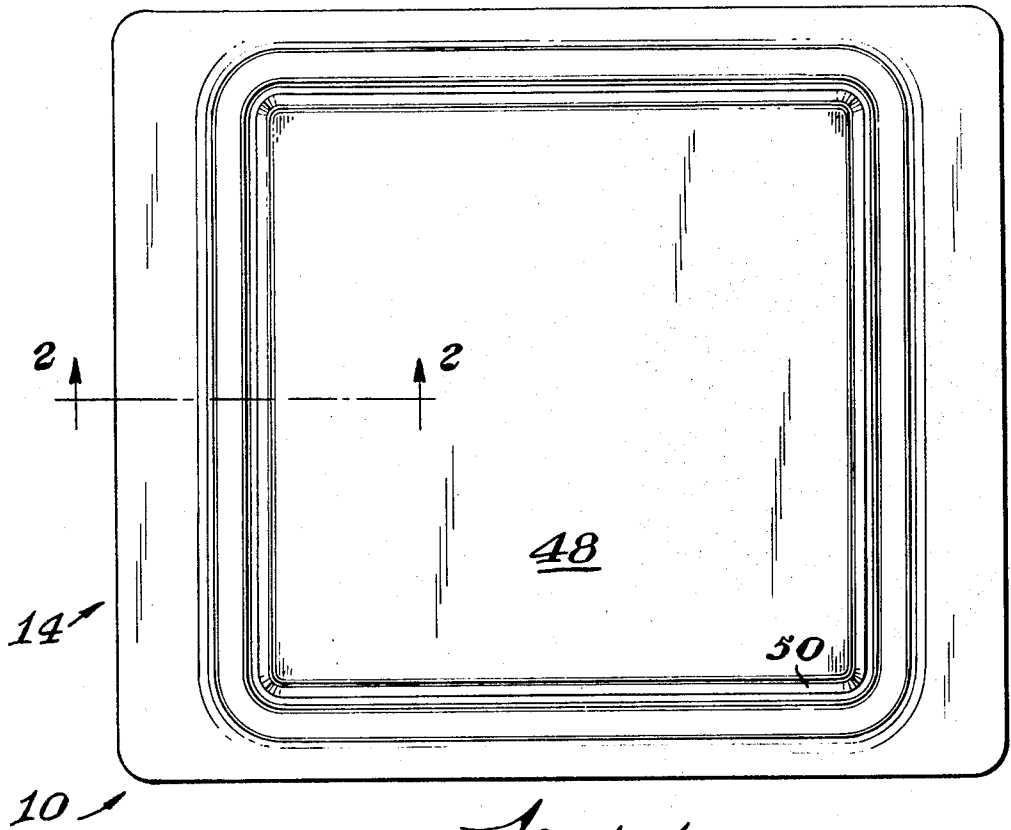


Fig. 1

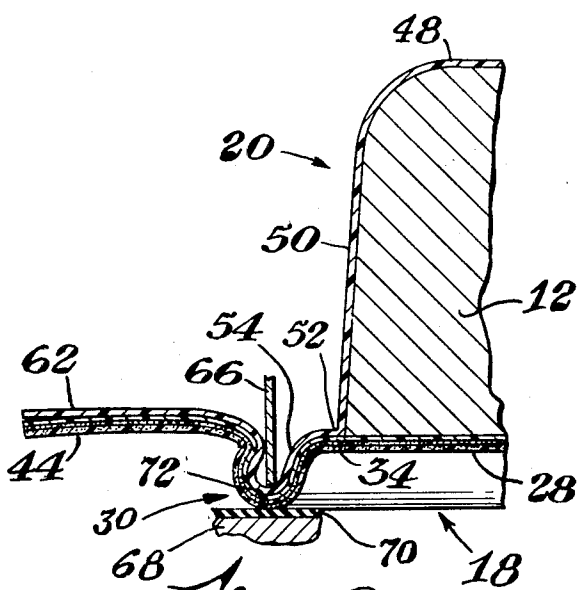


Fig. 2

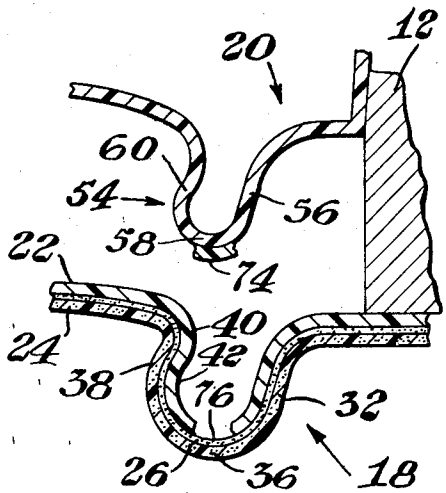


Fig. 3

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RESEALABLE CONTAINER

DESCRIPTION OF THE INVENTION

This application is a continuation of my prior application Ser. No. 750,111, filed Aug. 5, 1968, now abandoned, which, in turn, is a continuation-in-part of my prior application Ser. No. 639,213, filed May 17, 1967, now U.S. Pat. No. 3,454,158.

The present invention relates generally to a resealable container, the container normally including two peripherally mateable, self-supporting components. A self-supporting construction is especially desired since the structural integrity of such adapts the container to function as a storage receptacle after initial opening. As a storage receptacle, it is highly desirable that the two components tightly reseal together to optimize the protection afforded the unused portion of the product.

Accordingly it is an object of the present invention to provide an improved seal construction between the parts or components of a container, the seal construction, when broken, having a resealable capability.

Briefly then, the present invention contemplates an improved seal construction for a container wherein the container normally includes two peripherally mateable generally self-supporting components, as for example, a lid and a tub. In a specific embodiment, the lid is formed of a laminate comprising a film secured to a backing of plastic foam. Securing the film to the foam backing is a permanently tacky, pressure sensitive adhesive layer. In the seal construction contemplated, the lid is fitted to the tub, film side down (that is, with the film side of the lid engaging the tub) and the two components are peripherally and hermetically sealed together by applications of heat and pressure. It critical that the strength of the seal be of a greater magnitude than the adhesive forces securing the film to the foam backing. In other words, the seal strength is sufficient such that upon breaking seal, the film in the vicinity of the seal remains attached to the tub and is torn away from the foam backing, thereby, exposing the layer of pressure sensitive adhesive. The exposed adhesive layer forms a tacky sealing surface for purpose of resealing together the two components of the container.

Yet additional objects and advantages of the present invention, and its numerous and cognant benefits, are even more apparent and manifest in and by the ensuing description and specification taken in conjunction with the accompanying drawing, in which wheresoever possible, like characters of reference designate corresponding material and parts throughout the several views thereof in which:

FIG. 1 is a top view of a package including a container constructed according to the principles of the present invention;

FIG. 2 is an enlarged fragmentary cross sectional view of the package of FIG. 1 taken along reference line 2—2 and additionally including a fragmentary view of sealing elements; and

FIG. 3 is a view like FIG. 2 only showing the package partially opened.

Referring now more particularly to the drawings, there is shown in FIGS. 1 and 2, a package 10 of flat generally rectangular configuration, and comprising a product 12 such as luncheon meat, cheese, frankfurters, chili, or the like, packed within a hermetically sealed self-supporting container 14. Container 14 includes a generally flat self-supporting first component or lid 18, and a second component or tub 20, preformed to product shape and peripherally joined together with the lid 18.

Lid 18 comprises a film and foam laminate structure and is preferably pressure formed from a sheet of such laminate material. Specifically lid 18 includes a first ply 22 (as seen in FIG. 3) of plastic film directly engaging the underside of product 12, and secured to a second ply or backing 24 of plastic foam. A permanently tacky pressure sensitive adhesive layer 26 secures the film ply 22 to the foam backing 24.

Generally the film ply 22 forms a barrier to the passage of gas and vapor to maintain a desired product environment

within package 10. Film ply 22, however, also imputes additional tensile characteristics to lid 18 whereby a premature splitting or cracking of the generally more brittle foam backing 24 is minimized during repeated opening and closing operations. Well recognized barrier films suitable for forming film ply 22 include vinylidene chloride and vinyl chloride polymers and variously modified homopolymers and copolymers thereof, as for example, a copolymer of vinylidene chloride and vinyl chloride (saran). As a specific example of a saran film, film ply 22 can comprise a copolymer of about 85 percent vinylidene chloride and about 15 percent vinyl chloride. For saran, a film thickness in the range of from about 0.5 mils to about 2.5 mils is usually satisfactory. Most desirably the film ply 22 is biaxially orientated for reasons which will be explained in more detail hereafter.

Foam ply 24 preferably comprises an expanded polystyrene which is of a relatively low material cost and is thereby particularly advantageous for the throwaway packaging applications. Beneficially, foam densities of about 3 to 12 lb. per/cu. ft., and thicknesses in the range of between about 10 to 100 mils can be employed with the optimum choice varying considerably with different package sizes, dimensions, and weights.

The adhesive layer 26 securing the film ply 22 to the foam backing 24 is one which remains in a permanently soft or tacky state. Such adhesives are commonly referred to as pressure sensitive adhesives. To prepare the laminate, comprising lid 18, a sheet of the foam material is coated on one side with the adhesive, as for example, by a suitable spraying or brushing technique, and the film laminated to the coated side of the foam sheet, as for example, by placing the film and foam in superposed relationship and applying pressure and/or heat as would be appropriate for the adhesive involved. Pressure is conventionally applied by means of nip rollers, one of which is usually covered by a pad or layer of rubber. Thereafter the laminate can be cut and pressure formed by conventional techniques to the size and configuration desired of lid 18.

Specifically, adhesive layer 26 can comprise a copolymer of 50 percent styrene and 50 percent butadiene. This adhesive is conventionally applied in a latex form and then dried to form a permanently tacky pressure sensitive adhesive layer 26. Adhesive coating weights in the range of between about 0.5 and about 2 lb. per 1,000 square ft. are suitable with the higher limit giving generally greater tackiness for resealing purposes, as is explained more fully hereinafter. For example only, other suitable adhesives for layer 26 include that adhesive sold under the designation L8 59 by the Evans Adhesive Corporation of Columbus, Ohio, and that sold under the designation Adhesive No. 3043 by the United Shoe Machinery Corporation of Beverly, Mass. The former is applied in latex form while the latter is applied in much the same manner as a hot melt, that is, the adhesive is heated to a desirably thin or flowable state and then applied by means of a roller or the like.

Structurally, lid 18 can include a generally flat portion 28 dimensional adequate to receive product 12, and a marginally disposed groove 30 peripherally continuous about the flat portion 28. More specifically, groove 30 is of a generally U-shaped cross-sectional configuration and includes a skirt or inner wall 32 extending generally downwardly and outwardly from flat portion 28, and defining therewith a horizontally disposed shoulder 34. Groove 30, further includes a rounded bottom or flange portion 36 extending generally outwardly from inner wall 32. Flange portion 36 merges into an outer wall 38. The outer wall 38 necks inwardly at its upper portion to form an inner pocket or undercut wall portion 42. A peripherally continuous lip 44 extends outwardly from the upper portion 40 of outer wall 38.

Tub 20 is preferably preformed from a plastic web of material by usual pressure forming techniques, the web employed being of sufficient thickness to provide both adequate air and vapor barrier characteristics and a self-supporting structure. A polyvinyl chloride web material is preferred

because of both relatively excellent barrier and self-supporting characteristics, but other plastics or multilayered combinations thereof having properties like polyvinyl chloride, such as saran or a saran coated polystyrene, can be utilized to form tub 20.

Most advantageously tub 20 is preferably transparent to allow free viewing and inspection of product 12 and includes a top 48, and a sidewall 50 peripherally integral with the top of 48 and depending downwardly and outwardly therefrom. Sidewall 50 defines a horizontal shoulder 52 which beneficially mates with shoulder 34 of lid 18, and a tongue portion 54 depending from shoulder 52 and disposed in groove 30. Tongue 54 is of a generally U-shaped cross-sectional configuration to snugly fit the contour of groove 30, and correspondingly includes an inner wall 56, a rounded bottom or flange portion 58, and an outer wall 60, each of these parts being in flush, superposed relationship with the corresponding parts of the groove 30. A peripherally continuous lip 62 extends generally outwardly from outer wall 60 of tub 20 in generally superposed relationship with lip 44 of lid 18.

Referring particularly to FIG. 2 there is shown opposed members of sealing apparatus suitable for peripherally joining together tub 18 and lid 20, and specifically a heat applying jaw 66 disposed in grooves 30 and pressured against the rounded bottom portion 58 of tongue 54. Opposed to jaw 66 is a back-up member of jaw 68, the working surface 70 of which conventionally comprises a pad or layer of resilient seating material, as for example, neoprene, silicone rubber or the like. The heat and pressure applied by jaws 66 and 68 fuse or weld together the superposed bottom portions 36 and 58 of tongue 54 and groove 30, respectively, in a peripherally continuous seal of weld 72. Specifically seal 72 fuses the film ply 22 of lid 18 to the underside of tongue 54. More specifically, at the seal 72, film ply 22 thins somewhat due to the pressure and heat applied by jaws 66 and 68. Also where a biaxially orientated film forms film ply 22, there is incurred a loss of orientation in the film at the vicinity of the seal (i.e., the film ply 22 becomes more randomly orientated). The effect of these changes is a significant weakening of the film ply 22 at the seal 72, which weakening is beneficial to the objects of the present invention as will become evident hereinafter.

The inner workings of packages constructed according to the principles of the present invention are best illustrated in FIG. 3. Upon breaking the seal 72 of package 10, the portion 74 of film ply 22 located in the region of the seal remains attached to tub 20 and is torn away from the form backing 24, exposing therebeneath the adhesive layer 26. The adhesive layer 26 forms a tacky sealing surface 76 continuous at the bottom portion 36 of groove 30, where by refitting the tongue 54 into groove 30, a resealing together of the lid 18 and tub 20 can be obtained.

For a preferential separation of the film and foam laminate comprising lid 18 to occur as described above, it is important the seal 72 between film ply 22 and tub 20, be of greater strength than the bond between the film ply 22 and foam backing 24, that is, the bond between the film and foam as obtained by the adhesive layer 26. Obtaining the appropriate degree of seal 72 strength should present no problem to those skilled in the art, and for the conventional heat sealing techniques would usually involve proper adjustments in temperatures, pressures and dwell times. Adhesion promoting agents as for example, coatings of suitable adhesives, solvents, and the like can also be employed to effect the degree of seal 72 strength desired.

The benefits achieved by weakening the film ply 22 in the seal 72 region can be appreciated whereby only the portion of the film ply 22 in the vicinity of the seal is torn away from the foam backing 24. Desirably the sealing techniques employed cause both thinning and loss of orientation of the film ply 22 at the seal, although conceivably the effect of either type of weakening would be sufficient in particular applications.

In the practice of the present invention, a backing 24 of plastic foam is preferred. The fine qualities of a plastic foam

backing, especially as such concerns vacuum packaging applications, are set out in some detail in U.S. Pat. application Ser. No. 639,213, filed May 17, 1967. Therein sophisticated package designs employing plastic foam are taught, which designs can be employed in the practice of the present invention where suitable modified to the principles thereof.

With the advent of coextrusion techniques, as for example, like those illustrated in British Pat. No. 915,310 and Italian Pat. No. 522, 838, multi-ply films have become useful for use as packaging materials. Multi-ply films can be employed to form film ply 24 where the adhesion between the layers of the film is sufficient to cause a clean tear through the film ply 24 upon breaking the seal 72 of container 14. Multi-ply films that delaminate leaving one or more plies covering the adhesive layer 26 would not be suited for film ply 22.

While certain representative embodiments and details have been shown for the purpose of illustrating the invention, it will be apparent to those skilled in the art that various changes and modifications can be made therein without departing from the spirit and scope of the invention.

Accordingly what is claimed as new is:

1. An easy openable and recloseable package including a container comprising first and second preformed self-supporting components, a product enclosed within said container, said first component comprising a plurality of intimately joined layers including first and second layers having disposed therebetween a pressure sensitive adhesive layer, a seal between said first layer and said second component and which joins said components together, said seal and first component being characterized such that when said seal is ruptured by separating said components, a select portion of said first layer in the vicinity of said seal remains attached to said second component and is separated from said first component, thereby exposing a strategically arranged area of said adhesive layer for purposes of resealing together said components.

2. The package of claim 1 wherein said first component includes a mating means preformed therein and which extends peripherally continuous about said product, and wherein said second component includes a peripherally continuous mating means preformed therein and matingly fitted together with the preformed mating means of said first component, said seal extending along a peripherally continuous path joining together said components in the region of said mating means.

3. The package of claim 2 wherein said package includes first and second tab means associated with said first and second components respectively, and operable to conveniently separate said first and second components from each other.

4. The package of claim 2 wherein said container is hermetically tight, and wherein said product is stored within said container in a controlled environment.

5. The package of claim 1 wherein said second layer comprises polystyrene foam having a density in the range of between about 3 to about 12 lb. per cubic foot, and a thickness in the range of between about 10 to about 100 mils.

6. The package of claim 5 wherein said first layer comprises saran having a thickness in the range of between about 0.5 to about 2.5 mils.

7. The package of claim 1 wherein said first layer and the portions of said second component engaging said first layer are thermally compatible, said seal comprising a heat seal.

8. The package of claim 1 wherein said first layer is weakened in the vicinity of said seal to obtain the preferential tearing of said weakened portion from said first layer upon rupturing said seal.

9. The package of claim 8 wherein said weakening comprises a thinning of said first layer.

10. The package of claim 8 wherein said first layer is biaxially orientated film and said weakening comprises a loss of orientation of the first layer in the vicinity of said seal.

11. A container having product therewithin and comprising first and second preformed self-supporting components, said first component comprising a plurality of intimately joined

layers including an intermediate layer of a pressure sensitive adhesive, a seal joining said components together, said seal and said first component being of a character such that when said components are separated, the portion of said first component in the vicinity of said seal and which exists between said adhesive layer and said second component, remains attached to the second component, thereby exposing a strategic area of said adhesive layer for resealing purposes.

12. The container of claim 11 wherein said first component includes therein preformed mating means which extend peripherally continuous about said product, and wherein said second component includes therein a peripherally continuous mating means mated together with the mating means of said first component, said seal being peripherally continuous about said product and being located along a path generally coin-

cident with and joining together said mating means of said first and second components.

13. The container of claim 12 wherein said seal comprises a heat seal between adjacent thermoplastic surfaces of the first and second components.

14. The package of claim 13 wherein said container is hermetically tight about said product, and wherein said product is stored within said package in a controlled environment.

15. The package of claim 13 wherein said environment comprises a vacuum environment about said product.

16. The package of claim 13 wherein said portion of said first component in the vicinity of said weld is weakened due to the application of the heat and/or pressure applied thereto in the forming of said seal.

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