

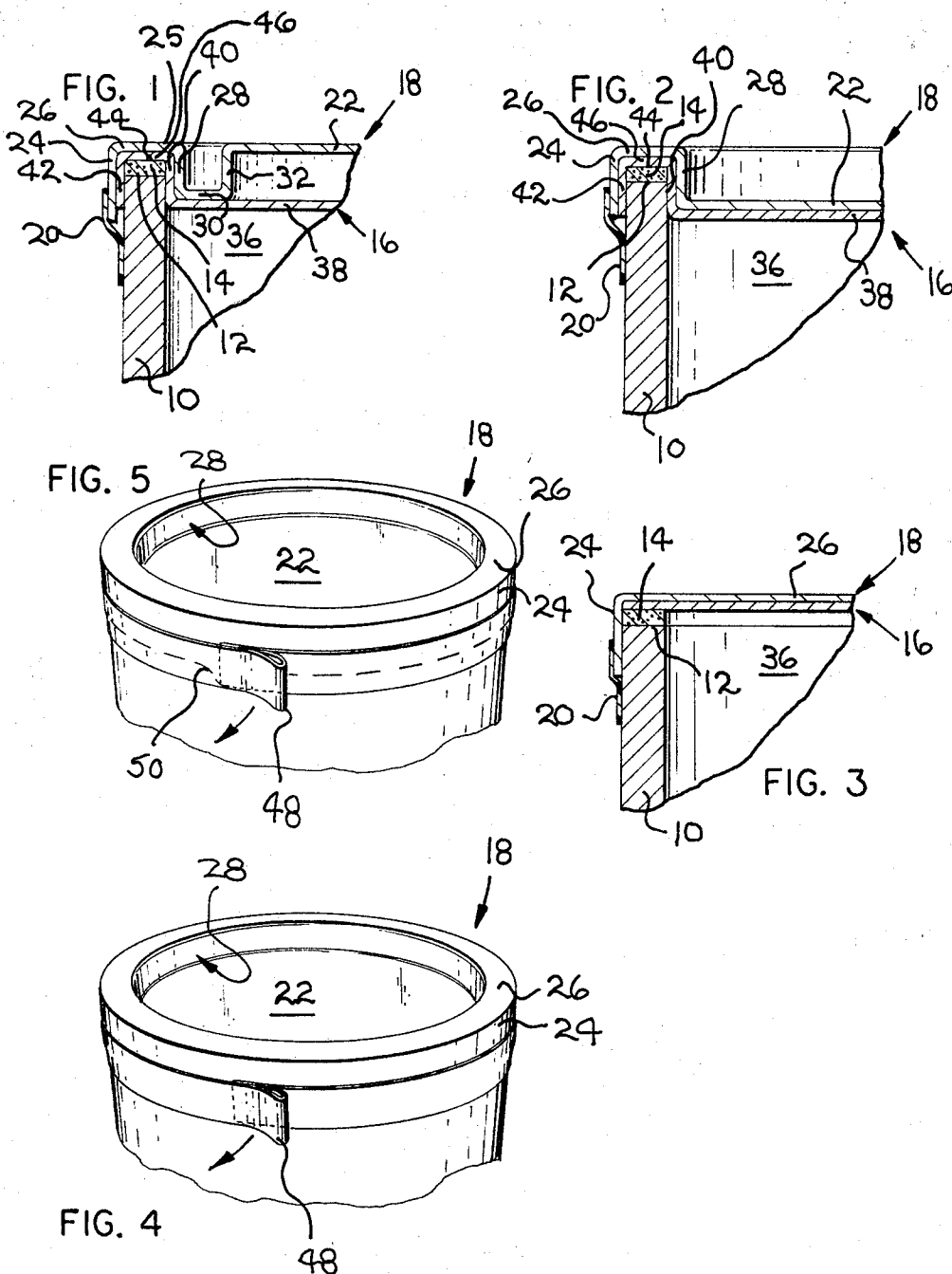
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COMPOSITE CONTAINER AND SEALING MEANS THEREFOR

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COMPOSITE CONTAINER AND SEALING
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ABSTRACT OF THE DISCLOSURE

An easy-open package comprising a fibrous container having its raw edge sealed with a heat regenerating material, an end sealing member bonded to the heat regenerating material, a protective closure disposed outwardly of the end sealing member and releasable means for securing the closure to the container.

Background of invention

This invention relates to composite containers; more particularly, it relates to closures and means for sealing those composite containers which are comprised at least in part of a fibrous material.

Primarily because of the low cost of preparation and ease of disposal, fibrous composite containers are currently used to package a multitude of items, including solids, liquids, and semiliquids. Typically, these containers have an internal lining or coating which is impervious to the packaged items and to the ambient surroundings consequently, the lining not only protects the items from potentially undesirable ambient conditions, but also prevents absorption of these items by the fibrous material which, if not prevented, would severely decrease the structural qualities of the container.

While the lining noted above generally affords adequate protection to the body of the container, several types of composite containers, for example spirally wound fiberboard having an aluminum liner, are prepared in such a manner that the container has an upper edge of exposed fibers. Unless isolated, this exposed edge is capable of absorbing both a fluid product which may seep into this area, and vapors attributable to volatile products. This edge absorption and the subsequent diffusion or permeation of the absorbed product into the fibrous structure again creates the problem of reducing the strength of the container.

Several containers, and closures therefor, have been disclosed in the arts in an attempt to eliminate this edge absorption problem, each of which are subject to deficiencies. One attempt at minimizing the problem is a container and closure combination wherein the sealing of the product is accomplished substantially below the container edge; however, this requires a substantial deformation of the container itself which not only is impractical for certain containers, e.g., spirally wound composites, but also decreases the strength and rigidity of the container. Another remedy of this problem involves the use of a closure with an integrally attached sealant; however, here the closure is placed upon the container and, by means of a heated pressure ring, the closure is heated so as to allow it to be formed and compressed against the container surface, the heat also being used to aid the sealing of the edge. Since the latter type seal is produced concurrent with the closure forming and application, that is after the container has been filled with a product, the remedy may be incorporated too late. For example, should material be spilled upon the exposed edge during the filling operation, the deterioration of the container strength will begin at this time and the subse-

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quently applied seal will be to no avail. Secondly, since the closure is heated and compressed during its application, it necessarily becomes tightly held against the container and requires the use of a foreign implement, such as a knife edge to release it. Unless extreme care is used during the closure release, the employment of these implements generally will result in a substantial deformation of both the closure and the container, thereby substantially eliminating any possibility of replacing the closure onto the container, should the product not be entirely consumed.

Summary of invention

Accordingly, it is an object of this invention to provide for an improved article of manufacture which is not subject to the deficiencies hereinbefore noted.

It is another object of this invention to substantially eliminate the absorption of a packaged product by the raw edge of a fibrous composite container.

It is another object of this invention to provide a closure for a composite container which can be easily removed from the container without deforming either the closure or container.

It is yet another object to provide for a substantially hermetically sealed fibrous composite container.

It is still another object of this invention to provide a removable closure for a substantially hermetically sealed, fibrous container which may be resealed by the closure to protect the remainder of unconsumed product.

In the achievement of the foregoing, and other objects, the invention contemplates a composite fibrous container having its raw edge sealed with a heat regenerating material, an end sealing member bonded to the edge sealing material, a protective closure disposed outwardly of the sealing member, and releasable means for securing the closure to the container.

Drawing description

The foregoing will become more apparent by reference to the attached drawings, of which:

FIGURE 1 is a fragmentary sectional elevation view of a composite fibrous container showing an embodiment of the closure means therefor;

FIGURE 2 is a fragmentary sectional elevation view showing an alternate embodiment of the closure means;

FIGURE 3 shows another embodiment of this invention for sealing an open end of a fibrous composite container;

FIGURE 4 is a partial isometric view of a container having an open end thereof sealed with the sealing means of this invention, and illustrates the easy open features of this invention;

FIGURE 5 is a view similar to FIGURE 4 showing an alternate embodiment of the easy open features.

The drawings generally show a fibrous composite container having a vertical wall 10 terminating in upper edge or rim 12 defining an open mouth or end 36 of the container. These vertical walls may, for example be constructed mainly of one or more plies of fiberboard wound into a cylindrical configuration and internally lined with a suitable material, such as aluminum foil, to protect the fiberboard from the deleterious effects of the container contents. Additionally, the upper edge of these containers, as currently produced, is comprised of the raw fibrous material which, as previously noted, is capable of absorbing the container contents which are in contact with the upper edge. In order to prevent any absorption and to provide a satisfactorily sealed package, the upper container edges 12 are suitably sealed with a heat regenerating adhesive applied as an annular upper band 14 and subsequently a mouth enveloping liner 16 which is impervious to the container contents and to the ambient surroundings is affixed

to the adhesive. Outwardly of the liner 16 is a reclosable protective closure 18, attached to the container by means to be subsequently described.

The heat regenerating adhesives which are preferred for the practice of this invention are tenacious inactive solids at room temperature but which, upon moderate heating, can be converted to a sticky molten mass. Preferably, the materials have softening points substantially below 600° F. in order that they may be softened during the thermal regeneration without causing pyrolytic degradation of the container. These adhesives typically consist principally of film-forming resins and relatively small percentages of modifying agents, such as wax, and non-film-forming resins. Resins which are suitable for these adhesives include cellulose esters and ethers, polyvinyl esters and acetals, polyamides, polyethylene, and various alternate combinations thereof; the most commonly used wax modifiers including paraffin and microcrystalline waxes. Numerous commercial materials are available generally having the characteristics hereinbefore noted; one such preferred material is a product manufactured and sold by Eastman Chemical Products Inc. of Kingsport, Tenn., as their adhesive C-16 and described in their technical brochure TDS No. F-130.

Impervious liners which are particularly suitable for the practice of this invention are the metallic foils, such as aluminum and tin; other suitable liners include hydrophilic films like the cellophane compositions or waxed papers and polymeric materials, for example polyolefin, polyester and vinyl films.

Preferentially, the heat regenerating adhesive 14 is applied to the exposed raw edges 12 of the container substantially contemporaneous with the container formation. The adhesive may be applied with conventional coating equipment, for example rollers which dispense the heated material unto the edge of the container whereupon cooling to room temperature, the material solidifies upon the edge causing it to become impervious to the container contents. This edge sealing prior to filling is desirable because the container will be completely impervious during the filling operation; hence, any spillages will be unable to permeate the fiber walls.

FIGURE 1 represents a preferred embodiment of this invention in which a metallic liner 16, for example aluminum foil having a thickness of about .001 inch, is applied to the container as an independent sealing member. Generally, the liner 16 is comprised of a panel portion 38 transversely spanning the container mouth 36, and an outwardly disposed, downwardly concave annular flange 46 integrally formed at the periphery of said panel. The flange is comprised of a substantially vertical inner wall 40 which extends upwardly from its juncture with the panel 38 and in contact with both the inner surface of the container wall adjacent the adhesive 14 and the inner surface of the adhesive itself; the upper terminus of the inner wall merges with an outwardly extending, substantially planar upper hot melt engaging section 44, said upper flange section 44 terminating in a downwardly extending outer wall 42 which contacts the outer adhesive surface and extends along the container walls to a point beneath the edge 12 of said container. Sealing of the liner 16 to the heat regenerating adhesive 14 is accomplished by heating said adhesive, while in contact with the liner as described above, to a temperature whereby it becomes tacky and subsequently cooling to room temperature.

Disposed outwardly of the liner 16 is a substantially rigid, protective closure 18 which may be of either metallic or plastic composition. The liner protecting closure 18 is preferably preformed in such fashion so as to produce an inner panel portion and an annular, downwardly concave flange portion which loosely mates and contacts the corresponding flange 46 of the liner. As shown in FIGURE 1, the closure 18 comprises a panel portion 22 terminating at its periphery in a downwardly extending annular wall 32; said wall 32 merges at its lower terminus in

a radially and outwardly extending annular ledge 30 which is disposed beneath the sealed edge 12 of the container walls and which in turn merges with the closure flange portion 26. The closure flange 26 is comprised of a substantially vertical inner skirt or wall 28 which projects upwardly from the outer margin of the radial ledge 30 and terminates in an upper outwardly extending radial ledge 25. The radial ledge 25 merges with an outer annular skirt 24 which extends downwardly along the outer wall surface to a point beneath the edge 12 of the container.

In a preferred embodiment, the distance between the inner surface of the outer skirt 24 and the outer surface of the inner flange skirt 28, at least at its juncture with ledge 30, is such that the closure flange 26 will contact and urge the liner flange 46 into more intimate contact with the hot melt material 14 and the adjacent container wall surfaces. Additionally however, this distance must not be decreased to such a degree that it causes appreciable difficulty in removing the closure 18 from the container.

The outwardly disposed closure 18 is ultimately secured to the container by adhesive means, such as a tape 20, which concurrently contacts the external surface of the outer closure skirt 24 and outer surface of the container wall 10 adjacent the skirt. The preferred adhesive means comprises a conventional pressure sensitive tape, for example, a product manufactured and sold by the Minnesota Mining and Manufacturing Company of St. Paul, Minn., as their No. 850 (described in their brochure entitled "Tapes for Industry" at p. 18), which is circumferentially wound about said outer skirt and the adjacent container walls having its outwardly disposed longitudinal extremity terminating in an integrally attached pull tab 48. The pull tab may be of any conventional design, such as a semi-rigid material attached to the adhesive side of the tape near its extremity or it may be formed by simply rolling the tape under itself and securing the under-rolled portion to the main tape body.

FIGURE 2 shows an alternate embodiment of the outer closure 18 of this invention. The inwardly disposed liner 16, which is substantially as described in conjunction with FIGURE 1, includes the recessed panel portion 16 and an integrally attached, upwardly extending, downwardly concave peripheral flange 46 fitting over the container edge and engaging the inner and outer container wall surfaces adjacent said edge, heat regenerating material 14 being used to adhesively affix the liner to the container. The outer closure 18 is provided with a recessed central panel 22, disposed beneath the edge 12, and includes a peripheral flange 26 integrally attached thereto. Like the closure flange of FIGURE 1, the flange is comprised of a substantially vertical inner skirt 28 projecting upwardly from the outer margin of the central panel 22 and terminating in an outwardly extending radial ledge 25; the ledge in turn merges with an annular, downwardly extending outer skirt 24. These inner and outer flange skirts, 28 and 24 respectively, contact and urge the liner flange 46 into more intimate contact with adhesive 14 and adjacent container wall surfaces.

FIGURE 3 shows an alternate embodiment of this invention in which the liner 16 is in the general shape of a disc having an area which is substantially that of the container mouth defined by the wall 10. Subsequent to the thermal bonding of the liner 16 to the heat regenerating adhesive 14 an outwardly disposed closure 18, having a panel portion 22 and an annular attaching skirt 24 depending therefrom, is positioned about the liner and container walls. The annular skirt 24 extends downwardly beneath the edge of the container and preferably loosely contacts the outer surface of the walls 10.

The modified closure configurations of FIGURES 2 and 3 are also secured to the container by means of the pressure sensitive tape 20 having an integrally attached pull tab 48.

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In order to remove the sealing means of this invention, the pull tab 48 is grasped and turned in a direction (FIGURE 4) to release the pressure sensitive tape 20 from the container, whereby the closure 18 may be easily lifted from the container; the liner may then be removed in any conventional manner, for example by rupturing and removing its panel portion, thereby allowing procurement of the container contents. Subsequent to this opening, the outer closure may be repositioned upon the container, thereby protecting the unconsumed contents from contamination by dust or the like.

Alternate to the liner and outer closure being independent members, the liner composition may be coated or affixed unto the inner surface of the outer closure by conventional laminating techniques, thereby providing a unitary laminated closure which can be bonded to the heat regenerating adhesive. The attachment of a laminated closure is somewhat stronger than that obtained with the embodiments previously described because, in addition to being secured by the pressure sensitive tape, a unitary closure will also be secured means of the bond between the heat regenerating adhesive and the internal surface of the laminated closure. Consequently, care must necessarily be exercised to insure that the strength of the additional bond is not of sufficient magnitude to vitiate the easy open features of this invention.

Currently used composite containers are frequently provided with the manufacturers identifying or advertising label pasted upon the external container surface and coextensive therewith. Because the lower portion of the pressure sensitive tape of this invention adhesively engages the outer container surface, which as noted above may be comprised of the label, the removal of the tape creates a problem of tearing this label from the container. In order to eliminate this label tearing the pressure sensitive tape may be provided with a circumferential line, indicated at 50, providing a weakness or tear line in the tape. This tear line may for example be formed by scoring the tape and is preferentially disposed adjacent the lower terminus of the outer closure skirt; thus, as can be seen in FIGURE 5, only that portion of tape existing upwardly of the tear line will be removed from the container and that portion disposed downwardly of the tear line 50 will remain attached to the container and function as a barrier to substantial label tearing.

While various embodiments of this invention have been disclosed and described in detail, it will be apparent to those skilled in the art that these embodiments may be modified. Consequently, the foregoing description is to be regarded as exemplary rather than limiting and the true scope of the invention is as defined in the following claims.

We claim:

1. An improved reclosable package comprising in combination: a container having a vertical wall, the upper edge of said wall being comprised of exposed fibrous material and defining an open end of said container; means for

sealing said exposed edge against absorption of the packaged contents; a liner covering the open container end and bonded to said edge sealing means; a reusable closure for covering the open end of the container and overlying the liner, said closure having an annular skirt extending downwardly and outwardly along said container wall to a point thereon below its sealed edge; means for securing said closure to said container, said means engaging said closure skirt and the exterior of said container wall, and means coupled with said securing means for selectively releasing the closure for removal thereof from the container.

2. The package of claim 1, wherein said liner is comprised of a material impervious to the packaged contents and ambient surroundings, whereby the bonding of said liner to said edge sealing means effectively produces a hermetically sealed package.

3. The package of claim 1, wherein said means for securing said closure to said container comprises a pressure sensitive tape circumferentially disposed about said closure skirt and said adjacent container wall.

4. The package of claim 3, wherein said pressure sensitive tape is provided with a circumferential line of weakness adjacent the lower terminus of the downwardly extending annular skirt.

5. An improved package comprising in combination: a composite fibrous container having a circumferential wall terminating in an upper edge of exposed fibers and defining an open end of said container; a heat regenerating adhesive sealing said upper edge; a liner substantially spanning said open end and having a peripheral, downwardly concave flange fitting over said circumferential wall and being bonded to said heat regenerating adhesive; a closure disposed outwardly of said liner having a central panel portion extending over said otherwise open end and including an integrally attached, downwardly opening annular flange overlying said liner flange and urging said liner flange into intimate contact with the respective container wall surfaces; a pressure sensitive tape adhesively and circumferentially contacting the external surface of said annular closure flange and the exterior surface of said container wall adjacent said external surface, said tape including at its outer longitudinal extremity an integrally attached pull tab, whereby said tape may be, at least in part, removably released and said closure removed from the container.

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