

Jan. 28, 1969

H. A. SCOPP ET AL

3,424,342

CONTAINER

Filed Aug. 14, 1967

FIG. I

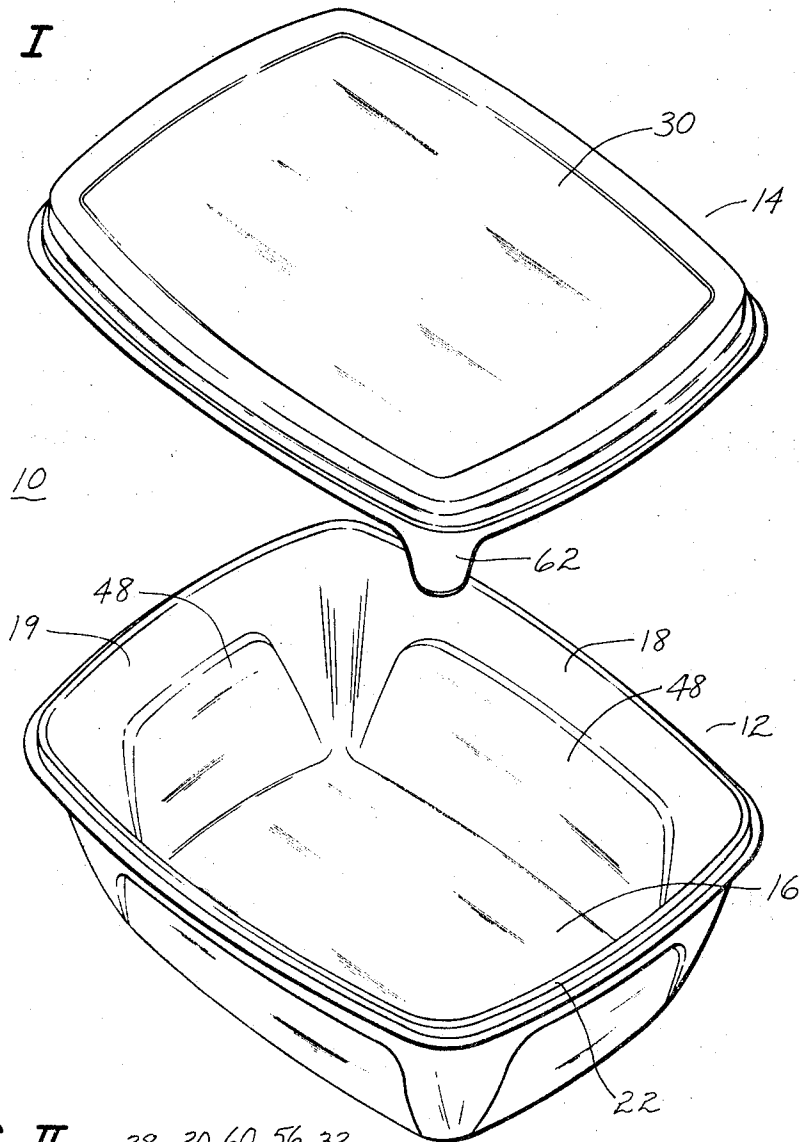
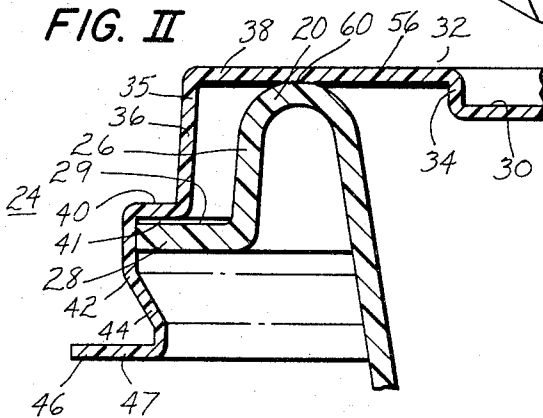


FIG. II



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3,424,342
CONTAINER

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13 Claims

Int. Cl. B65d 43/10

ABSTRACT OF THE DISCLOSURE

A container having a lid which is hermetically sealed to the body by a heat sensitive composition located between a peripheral portion of the container lid and an upper sealing surface of the container body, and having snap-attachment means for reclosing after initial seal rupture. The sealant may be a wax modified hot melt or a nitrocellulose modified composition applied as a lacquer.

This invention relates to containers and more particularly to air tight containers for holding materials which deteriorate on exposure to the atmosphere.

Jams, peanut butter, margarine, pickles and similar comestibles, as well as pharmaceutical items, are commonly packaged and marketed in a container having a body of wax-coated or wax-impregnated paper, or plastic, and a lid of similar material which is snugly fitted to the body to minimize the entry of air or the escape of liquids and gases from the closed container. Lids for such purpose as have been used are either the flush-type, which fit across the mouth of the container body and have a depending skirt for snap-on engagement with the body rim, or the plug-type which project into the body and likewise have a wall portion and skirt for snap-on engagement with the body rim. Such lids, without more, fail to provide satisfactory air and liquid tight containers, and thus the normal "shelf-life" of the package is materially reduced in view of the substantial weight loss of these materials through the joint prior to sale.

In addition, such prior lids are difficult to initially remove in view of the inordinately tight fit between the pressed on lid and the body, which is necessary in the original packaging, in order to minimize leakage through the seal. Removal of the tight fitting lid often results in distortion or mutilation of the lid by the user, and sometimes of the rim of the body mouth. Such partial destruction or mutilation in turn discourages reuse of the original lid to cover unused portions of the contents retained in the container body, either because the reused lid or body does not appear to be air tight, or has an unsightly appearance. Thus, the user tends to empty the unused portions from the original container body into usual household storage receptacles, and therefore the manufacturer loses the opportunity to keep his brand name before the user as it appears on the original package. In addition the difficulty or inconvenience experienced in initially removing the lid may result in the loss of subsequent sales. Attempts to provide a fully reusable lid have been frustrated by the commensurate difficulty of providing a satisfactory air tight seal of the lid on the body. This dilemma of difficulties which has only been compromised in the past, is effectively resolved by the present invention.

Accordingly, it is a principal object of the present invention to provide an improved air and liquid sealed container which affords protection to delicate contents, yet is easily opened by the consumer and readily reclosed during intermittent consumption of the packaged product.

It is an additional object of the present invention to provide a simple, easily formed container seal which is resistant to the container contents, and exhibits unusually

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low moisture and gas transmission characteristics so as to impart a long shelf life to the overall package.

It is a particular object of the present invention to provide an improved food container having a flush-type lid, hermetically sealed to the container mouth.

It is a further object of the present invention to provide a heat activated, block-resistant, tenacious but separable, lacquer type sealant disposed on a plastic container lid for closing the mouth of a cooperating plastic container body.

It is a still further object of the present invention to provide a hot melt type container sealant having the above-mentioned characteristics.

It is an additional object of the present invention to provide compositions and structure which overcome the aforementioned difficulties in the prior art.

Other objects of this invention will in part be obvious and will in part appear hereinafter.

These and other objects are accomplished by providing a hermetically sealed container comprising a body having an opening defined by an upper rim having a sealing surface, a lid for the body which abuts against the sealing surface to close the opening, a heat activated composition in adhesive, sealing engagement with the abutting portion of the lid and the rim sealing surface, and snap-attachment means outside said heat activated composition, associated with the body and the lid. The heat activated bonding agent may be either a nitrocellulose modified composition applied to the container as a lacquer, or a wax modified, hot melt composition.

In describing the overall invention, reference will be made to a preferred embodiment illustrated in the accompanying drawing in which:

FIG. I is a perspective view of a container of the present invention showing the body and lid in spaced relationship.

FIG. II is an enlarged fragmentary, sectional view of the container of FIG. I showing the lid sealed in place on the container body.

Referring now to FIG. I, there is shown container 10 which comprises body 12 in the form of a shallow, elongated oblong tub, and lid 14 for body 12. Body 12 has a planar base or bottom wall 16, a pair of opposed upwardly and outwardly divergent sides 18 and somewhat shorter sides or end walls 19, both pairs of which are contiguous with the bottom wall around the outer periphery thereof. Body 12 has an opening at the upper end of sides 18 and 19 defined by continuous, curved peripheral rim or seat 20 (FIG. II), having an outer sealing surface 22.

Lid 14 is of the flush type in that it spans the opening of body 12, and abuts against sealing surface 22 of upper curved peripheral rim 20 when in place on body 12. Lid 14 comprises top wall 30 and shallow peripheral projection 32 around the full periphery of top wall 30, having a width greater than that of rim 20. Projection 32 has a short inner side 34 which joins the outer periphery of top wall 30, an opposed, short, outer side 35, and a base 38 which is substantially parallel with top wall 30 and base 16 of body 12.

Snap-attachment means 24 associated with, and projecting outwardly from body 12 and lid 14 are provided around the full periphery of container 10. Snap attachment means 24 comprises, on body 12, elongated leg 26 extending downwardly and outwardly as an extension of curved seat 20, and engaging lip 28 which protrudes radially outwardly from the lower end of elongated leg 26. Snap-attachment means 24 further comprises on lid 14, slightly outwardly tapering skirt 36 at the end of outer side 35 of projection 32, and a generally S-shaped lower portion which includes radially outward shelf 40 at the lower end of skirt 36, socket wall 42 extending

downwardly from the outer edge of shelf 40 which tapers inwardly at 44 at its lower end, and lift tab or gripping edge 46 radially projecting outwardly from lower end 44 of the portion of snap-attachment means 24 on lid 14.

Sides 18 and 19 of body 12 may have slightly inwardly projecting reinforcing panels 48 to provide the container with a certain amount of crushing resistance to forces imposed from above. Preferably, the lids and bodies are stored by nesting within one another, and to facilitate such storage without unwanted sticking together of the parts, conventional stacking provisions well known to those in the art may be provided on both the body and lid.

In preparing the container for the packager's filling line, bonding agent 56 is deposited in shallow peripheral projection 32 of lid 14 by means, for example of the method and apparatus set forth in copending U.S. application No. 660,482, filed Aug. 14, 1967, and then allowed to dry therein in the case of a lacquer composition, or allowed to cool and harden in the case of a hot melt sealant. After the body is filled with the contents, flush type lid 14 is placed across the open mouth of container 12, so that curved peripheral rim 20 fits within upwardly extending peripheral projection 32, and outer sealing surface 22 of rim 20, and heat activated bonding agent 56 on base 38 of projection 32 are in abutting relationship. In order to accomplish this, the lid is initially placed loosely on the body, so that the underside 47 of lift tab 46 rests against the upper face 29 of engaging lip 28. Force is then vertically applied either manually or automatically, with the result being that lower surface 47 of the snap-attachment means on lid 14 is resiliently forced beyond and under lip 28, so that lip 28 snugly fits within the socket of the S-shaped portion of the lid snap-attachment means. When the snap-attachment means are engaged in this manner, upper surface 29 of engaging lip 28 abuts against inner surface 41 of shelf 40 on lid 14 to attach lid 14 to body 12.

Hermetic sealing of container 10 is accomplished by sealing the inner surface of the base 38 of peripheral projection 32 to the outer surface 22 of rim 20 on container 12 by means of heat sensitive bonding agent 56. This is done by conventional heat sealing equipment well known to those skilled in the art. For example a "Sentinel" heat sealer, manufactured by Packaging Industries, Montclair, N.J., provides suitable control of sealing pressure, dwell time and temperature for the sealing jaws in an otherwise known manner. The abutting peripheral body sealing surface 22 and the coated base of lid projection 32 are inserted between jaws of the sealing mechanism. The upper jaw, in contact with the outer surface of the lid is heated, the jaws brought together with a force of about 70 p.s.i.g. at about 275° F., and held for about two seconds to activate dried sealant 56 into liquid thermoplastic form and to create, on cooling, hermetic seal 60 joining the abutting portion of lid 14 with sealing surface 22 of body 12. Seals formed in this manner were evaluated and found to provide continuous and good adhesion of the lid to the body around the full periphery of the container mouth.

Removal of lid 14 from body 12 is accomplished by gripping lift tab 46 of flexible snap attachment means 24, and gently pulling outwardly thereon while lifting upwardly to sharply rupture hermetic seal 60. If desired a separate pull tab 62 may be employed to aid in initial rupture of seal 60. The lid is then progressively and easily peeled off of the body to provide access to the container contents. At any time thereafter, during subsequent use of the container, lid 14 may be releasably affixed to body 12 by means of snap-attachment means 24, by resting lid 14 across the mouth of the container and gently pushing downwardly on the lid to permit engaging lip 28 to snap into place in the socket of the

generally S-shaped portion of snap-attachment means 24 on the container lid.

The heat activated bonding agent may be a hot melt, wax modified composition, which is a solid at room temperature and melts at temperatures above about 150° F. The hot melt composition utilized herein is a blend of natural of synthetic paraffin waxes with various other polymers which include vinyl copolymers, such as copolymers of ethylene or other olefins, with maleic anhydride, acrylic acid or derivatives thereof, especially lower alkyl esters such as methyl or ethyl methacrylate or ethacrylate. Generally the hot melt composition is prepared from (a) 40 to 70% and preferably 50 to 60% of a paraffin wax (b) 0-60% and preferably 25 to 35% of a copolymer of ethylene and vinyl acetate containing 25-35% by weight of vinyl acetate and (c) 0-40% and preferably 20 to 30% of a rosin ester. One such blend consists essentially of (a) about 55% of a synthetic paraffin wax having an ASTM melt point of 145° F., (b) about 7% of an ethylene-vinyl acetate copolymer having a melt index of 22-28 and containing about 32-34% by weight of vinyl acetate, (c) about 16% of an ethylene-vinyl acetate copolymer having a melt index of 125-175, and containing 27-29% of vinyl acetate, and (d) 22% of the hydrogenated rosin acid ester of glycerol.

Applicable as rosin esters in this hot melt composition are wax compatible rosin acid esters having softening points between about 55 to 100° C., obtained by reacting mono or polyhydric alcohols either directly with a rosin acid, or with a polymerized rosin acid, or with a hydrogenated rosin acid. The rosin acids used may be any of those ordinarily employed such as sapinic acid, pimaric acid, abietic acid, etc. The esterifying alcohols include methanol, ethylene glycol, propylene glycol, butylene glycol, glycerol, diglycerol, high polyglycerols, pentaerythritol and the like.

This composition is found to be especially adherent to styrene based thermoplastics such as terpolymers of acrylonitrile, butadiene, styrene and is particularly adaptable to use with packages containing contents of a greasy nature, because of its resistance to the usual oils found in greasy foods. It is non-blocking at temperatures below about 120° F., leaves no residual odor when dry, melts at about 160° F. and has low gas and water permeability characteristics.

Also useful as the heat activated sealant in the present invention are lacquer compositions of non-volatile components in appropriate concentrations, dissolved in a solvent blend having the proper balance of boiling points and evaporation rates, as well as the ability to dissolve the non-volatile components without dissolving the container substrate. The lacquer compositions utilized herein consist essentially of three principal classes of non-volatiles, i.e. (a) nitrocellulose, (b) modifying resins and (c) plasticizers, dissolved in alcohol predominant solvent systems.

Generally, the non-volatile phase of the composition consists essentially of (a) about 30 to 60% and preferably 30 to 40% nitrocellulose, (b) about 30 to 60% and preferably 40 to 50% of an alkyd resin, and (c) about 10 to 30% and preferably 10 to 20% of a plasticizer.

The nitrocellulose employed in the coating composition desirably is cellulose nitrate containing a nitrogen content of about 10.9 to about 12.2%. Cellulose nitrate having a nitrogen content between about 10.9 and 11.2% is especially preferred. Nitrocellulose, because of its flammable nature, is usually commercially supplied in an alcohol-wet form, i.e. as a solid containing about 25-35 weight percent of ethanol.

The resin used to modify the nitrocellulose may be of a variety of types known in the art, e.g. alkyd type resins such as those made from phthalic anhydride and glycerol. Particularly preferred are the resins made by reacting maleic anhydride and rosin acid (e.g. sapinic, pimaric, abietic acids etc.). Other acceptable modifications of nitro-

cellulose can also be accomplished with a variety of other known resins which are capable of forming a flexible tenacious composition when admixed with the nitrocellulose, such as coumarone-indene resins, urea-formaldehyde resins, rosin modified hard alkyds, natural resins such as gum damar, polyacrylate esters, etc. The alkyd resins may be the polyhydric alcohol esters of rosin acids or alpha, beta-ethylenically unsaturated polycarboxylic acids, or anhydrides, adducts of rosin acids, or the polyhydric alcohol esters thereof.

Most of these alkyd resins are commercially available. The polyhydric alcohol esters of rosin acids (naturally available as ester gum) include the glycerol esters and the pentaerythritol esters commercially available under a variety of trade names such as "Amberol," "Pentalyn," "Cellolyn," etc. Methanol and phenol modifying esters include resins commercially available under the trade names "Abalyn," "Amberol," characterized by an acid number of between about 7 to 350. Adducts of alpha, beta-ethylenically unsaturated polycarboxylic acids or acid anhydrides and terpene hydrocarbons include resins commercially available under the trade name "Petrex" acid. Adducts of alpha-beta-ethylenically unsaturated polycarboxylic acids and rosin acids include maleic modified rosin acids and maleic modified rosin acid/glycerol esters commercially available under a variety of trade names such as "Lewisol," "Amberol," "Amberlac," "Cellolyn," etc. Of course, the optimum concentration of resin used will depend somewhat on its physical characteristics and the amount of plasticizer employed if any.

Any plasticizer known in the art for plasticizing nitrocellulose may be employed in the coating composition, such as dibutyl phthalate, dioctyl phthalate, dicyclohexyl phthalate and butyl benzyl phthalate. The corresponding esters of acids such as phosphoric, sebacic, azelaic acid are similarly useful. Epoxidized soya oil and other epoxidized oils are similarly useful.

The solvent blend employed in formulating the lacquer heat sealant is a mixture of a hydrocarbon of from 5 to 10 carbon atoms with an aliphatic alcohol of from 1 to 4 carbon atoms. Suitable hydrocarbons include, for example, toluene, xylene, pentane, hexane, cyclohexane, heptane, n-octane, iso-octane, n-nonane, n-decane, etc. Also useful are ethyl acetate, butyl acetate, ethylene glycol-monomethyl ether (methyl Cellosolve). Mixtures of aromatic and aliphatic hydrocarbons may be used provided such mixtures do not form a solvent for the container substrate. Similarly, mixtures of aliphatic hydrocarbons or mixtures of aromatic hydrocarbons may be used. Suitable aliphatic alcohols include for example, methanol, ethanol, propanol, isopropanol, etc.

The solvent blend itself is comprised of (a) from 10 to 30% and preferably 15 to 25% by weight of the 5-10 hydrocarbon, (b) and from 70 to 90% and preferably 75 to 85% by weight of the 1-4 carbon alcohol, the total on all percentages being 100%. These figures represent the composition of the solvent blend without any solid component present. The proportions of the various components used in the solvent blend as well as the nature of these components, e.g. whether an aromatic or aliphatic hydrocarbon will be used is largely determined by the nature of the modifying alkyd resin used.

Generally the lacquer coating composition will comprise from about 60-90% by weight of the solvent blend, and correspondingly, from 40-10% by weight of the non-volatile or solid component, and in the proportions, heretofore discussed. Preferably, at least 2% of the non-volatiles are employed in the sealing composition since the sealing properties of the coated container component tend to become inadequate if a more dilute composition is applied.

The above description and particularly the drawing is set forth for purposes of illustration only and is not to be taken in a limited manner.

As mentioned previously, there is provided by the

present invention, a hermetically sealed container comprising a body having an opening defined by an upper rim having a sealing surface; a lid for the body which abuts against the sealing surface to close the opening; a heat activated composition in adhesive, sealing engagement with the abutting portion of the lid and the rim sealing surface; and snap attachment means outside the heat activated composition, associated with the body and the lid.

The material from which the body and lid are formed may be of any material of sufficient strength to be fabricated relatively thinly and sufficiently flexible to permit the lid to be snapped onto the container body. Typical materials are paper, cardboard, plastics, etc. Generally, when plastics are used, the thickness of plastic material will range between about 3 to 30 mils. Preferred materials are those polymer plastics based on styrene. A particularly useful material is styrene-acrylonitrile-butadiene terpolymer when used with the previously mentioned wax modified hot melt compositions. Other suitable plastics which may be used are polyethylene or polypropylene; polyacrylates, polymethacrylates, polycarbonates, polyvinyl chloride, polyethylene terephthalates and the like.

Though it is preferred to use the porous applicator as described in copending application Ser. No. 660,482, filed Aug. 14, 1967, to apply the hot melt or lacquer heat sealant to the container surface to be sealed, these compositions may also be applied to the article by any conventional coating method, such as by rotogravure. Application may be either to the container lid or body. The quantity of coating applied should be such that the dry coating weight is from about 6 to 15 and preferably about 10 micrograms per square inch in the case of the lacquer composition and from about 50 to 120 and preferably about 90 micrograms per square inch in the case of the hot melt composition.

The bonding agent used to join the container lid and body must have low gas and water permeability properties, must be heat sensitive, be essentially odorless when dry, and be capable of tenaciously adhering to the container surface to which it is applied.

Since this heat sensitive material may be exposed to contact with the combustibles within the container, it should be non-toxic, and otherwise inert so as not to impart undesirable odors, tastes or colors to the comestibles, although these considerations may not be important if ingredients other than edibles are packaged in the container. Further, the adhesive material should have good low temperature block resistance, or else be amendable to shielding so that the coated parts may be stacked in conventional capping machines, and automatically fed therefrom without interference with each other as would otherwise be the case if the adhesive material were fully exposed and tacky in nature. Additionally, the adhesive material should not soften or melt at temperatures below the temperature at which the container comestibles or other ingredients are ordinarily packed, as for example, in hot pack situations. It must form a good bond between the heat conductive lid material and the material of which the receptacle part is made.

The snap-attachment means of the container of the present invention may take a variety of forms. For example, in place of the container depending skirt and lip, for fitment into a cavity in the lid sidewall, as shown in the drawing, an out-turned bead designed to fit into a mating concave portion on the lid could be used, with spaced, crimped areas beneath the concavity for finger gripping.

The preferred form of the container of the present invention is made of an acrylonitrile-butadiene-styrene polymeric plastic, and comprises a shallow, oblong body having a peripheral lid seat at its upper margin, and a resilient, snap-fitted flush type lid hermetically sealed to the body seat by a hot melt heat activated sealant

comprising 50-60% of a paraffin wax, 25-35% of a copolymer of ethylene and vinyl acetate and 20-30% of a modifying rosin ester.

The flush type spanning lid is preferred for a number of reasons. The container is relatively easily molded without concern for close matching tolerances on the lid and body such as for example, in the plug type closure wherein a substantial portion of the lid fits within the confining container body walls, and may also have close fitting projections for mating with grooves in the body walls. Snap-in provisions within the container body often become coated with the container contents during consumer use, which makes further closing and opening either impossible or undesirable. A flush type lid which is sealed to an upper rim surface is somewhat more conveniently removed than one sealed within the container body walls. The substantially planar lid eliminates a pocket or receptacle area where accidental spillage could collect as when a plug type cover is used. The combination of a hermetic seal with a flush type lid further minimizes close tolerance requirements of the package, since if molding irregularities or variances should occur in the mating surfaces in the body closure area which would otherwise cause leakage, these will be compensated for and taken up by the continuous peripheral hermetic seal between the lid and body.

The hot melt, heat activated sealant in the preferred form of the present invention has a low melting point and rapidly solidifies at ambient temperatures, thereby eliminating the need for any separate drying step after application, and correspondingly may be activated on the plastic surface at a low temperature, thereby avoiding distortion of the plastic. The essential component of this wax modified sealant composition is a paraffin wax which comprises a major proportion of the composition. Its attractiveness as a sealant in this application is based on the facts that it has good barrier properties, a low melting point, is relatively inexpensive, and may be effectively used to control the viscosity of the melt during application to the container lid. The ethylene-vinyl-acetate copolymer modifier of the basic wax component gives cohesive strength to the wax itself, and also improves adhesion of the wax to the package surface. The rosin ester modifier of this composition has been found to greatly increase the adhesion of the hot melt sealant to the container lid, which is a most significant factor when the container contents are comestibles, since partial transfer of some of the sealant to the body rim surface from its original location on the lid presents an unsightly and unsanitary appearance to the consumer after initial removal of the lid and exposure of the upper body edge. When packaging non-combustibles, transfer of the sealant from the lid to the body is most likely of no concern, and the rosin ester modifier may then be eliminated. The preferred container material is polymeric plastic acrylonitrile-butadiene-styrene, since this material can be readily thermo-formed from sheet into a glossy attractive and relatively stiff container, having accurate surface contour details.

The container of the present invention is uniquely suitable for containing various comestible materials in a sanitary, initially hermetically sealed state, yet is easily opened and readily reclosed in a somewhat air tight manner during intermittent later consumption of the packaged product by the consumer.

What is claimed is:

1. A hermetically sealed container comprising:
 - (a) a body made of a styrene based thermoplastic, having an opening defined by an upper rim having a sealing surface;
 - (b) a lid for the body made of a styrene based thermoplastic, which abuts against the sealing surface to close the opening;
 - (c) a heat activated composition in adhesive, sealing engagement with the abutting portion of the lid and the rim sealing surface comprising 40 to 70% of a

paraffin wax, 0 to 60% of a copolymer of ethylene and vinyl acetate and 0 to 40% of a rosin ester; and

(d) snap-attachment means outside said heat activated composition associated with the body and the lid.

2. The container of claim 1 wherein the abutting portion of the lid is a peripheral zone substantially parallel to the bottom of the container body.

3. The structure of claim 1 wherein the container body is a shallow elongated tub having a rectangular configuration, and the lid contour is similar to that of the body opening.

4. A hermetically sealed all plastic container comprising:

(a) a body having a planar bottom wall, slanted sides extending upwardly, and outwardly from the bottom wall, terminating in a continuous, rounded seat defining an opening;

(b) a flush type lid spanning the opening, having an upwardly extending peripheral projection for the rounded seat of the body, said projection having a cross-sectional width greater than that of the rounded body seat;

(c) a hot melt type heat activated composition in adhesive, sealing engagement with the base of the peripheral projection and the rounded seat of the body; and

(d) snap-attachment means laterally outwardly of said heat activated composition, on the container body and lid.

5. The container of claim 4 wherein the heat activated composition is a modified nitrocellulose composition.

6. The container of claim 4 wherein the hot melt composition consists essentially of a major proportion of a paraffin wax modified with an ethylene-vinyl acetate copolymer.

7. The structure of claim 4 wherein the container is an oblong tub.

8. The structure of claim 4 wherein the snap-attachment means comprise mating S-shaped and reverse L-shaped members.

9. A hermetically sealed container comprising:

(a) a plastic body having a planar bottom wall, a plurality of sides outwardly divergent and extending upwardly from the bottom wall, and an opening within the upper extremities of the sides defined by a rim having a curved sealing surface;

(b) a flush type plastic lid which spans the opening, and has a peripheral flange for contacting the rim sealing surface;

(c) a heat activated material in adhesive, sealing engagement with the flange and sealing surface; and

(d) resilient snap-attachment means projecting from the rim and the flange for releasibly attaching the lid and body.

10. The container of claim 9 wherein the body and lid are of an acrylonitrile, butadiene, styrene polymeric plastic material.

11. The container of claim 9 wherein the heat activated material is a hot melt composition consisting essentially of about 40 to 70% of a paraffin wax, about 0 to 60% of a copolymer of ethylene and vinyl acetate, and about 0 to 40% of a rosin ester.

12. The container of claim 9 wherein the body is an oblong tub.

13. The container of claim 10 wherein the heat activated material on a dry basis is a composition consisting essentially of about 30 to 60% of nitrocellulose, about 30 to 60% of an alkyd resin, and about 10 to 30% of a plasticizer.

References Cited

UNITED STATES PATENTS

3,216,610	11/1965	Klygis	220—60
3,290,856	12/1966	Rumberger	229—48

JAMES B. MARBERT, *Primary Examiner*.

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,424,342

January 28, 1969

Howard A. Scopp et al.

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, line 6, "of" should read -- or --. Column 6, line 44, "combustibles" should read -- comestibles --. Column 7, line 51, "non-combustibles" should read -- non-comestibles --.

Signed and sealed this 24th day of March 1970.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.

Commissioner of Patents