METHOD FOR SEALING BLISTER PACKAGES FOR EASY OPENING

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Filed: Mar. 20, 1974

Appl. No.: 452,913

Related U.S. Application Data


U.S. Cl. 53/14; 53/37; 426/389; 426/392

Int. Cl. B65B 5/04; B65B 25/06

Field of Search 426/106, 123, 130, 389, 426/392; 229/51 AS, 51 SC, 51 TC, 51 ST; 53/14, 37

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ABSTRACT

A blister-type package having extended edges that serve as tear-opening guidelines for outside-applied tape that bonds said edges together, and a method for sealing and unsealing the package.

2 Claims, 9 Drawing Figures
METHOD FOR SEALING BLISTER PACKAGES FOR EASY OPENING

BACKGROUND AND SUMMARY OF THE INVENTION

This is a division of Ser. No. 236,463, filed Mar. 20, 1972, and now U.S. Pat. No. 3,835,224.

The packaging and sealing of products within a thermo-formed plastic blister-type package in a manner that permits such packages and seals to be easily and simply opened is a continuing problem in this field of the packaging art. The problem became acute in connection with my copending application (wherein "blister-type" is defined) Ser. No. 121,010, filed Mar. 4, 1971, now U.S. Pat. No. 3,758,312, for "Packaging Embossed-Surfaced Butter and Margarine" in a preformed blister-type package. It was imperative that my embossed product be well protected and sealed against outside contamination, but equally important (because of its embossed highly-frangible surfaces) was the need for a simple, easy, non-contents-damaging, way of opening of the package. Any physical struggle and/or mis-shaping of the structure of this package by the consumer during opening could cause disfigurement of the content's embossed surfaces and thus destroy the very feature for which the consumer purchased it. But none of the prior-art in blister-type packaging disclosed a package structure that would guarantee against such disfigurement during opening. Thus it became the immediate overall objective of this invention to provide a method and means that would furnish such a guarantee.

This invention will use my embossed-surfaced butter as the exemplary product for its description, with the understanding that it also applies to the packaging of other items.

Blister-type packaging usually comprises at least two parts: (1) a top part which is the blister proper; usually made of a transparent film or sheet, molded to fit over and enclose the package's contents on all sides except the base, and (2) a flat base part which usually has a sealable coating, over a re-inforcing substrate, to which the blister is sealed on the inside surfaces of each part (i.e., the surfaces in contact between the blister and the base) for completely enclosing the package's contents. The parts two usually mate together at the base of the contents with poly-sided edges and three or more corners that have identical, matching, and touching perimeters and surfaces.

The prior-art practices for sealing two such pieces together have been quite uniform and standard; the uniformity and the standardness practiced more because of its obviousness for use with high-speed production-type machines and methods, than because the consumer's convenience-in-use was being enhanced. They have uniformly used an inside method for sealing but have considerably varied the means for sealing. Some use adhesives that coat, and become part of, the inside surfaces of both top and base; others apply a separate deposit of adhesive on the inside surface of either the top or base parts. Some seal both top and bottom together with heat and/or pressure. Some use a solvent to dissolve and then dry-bond the two adhesive-coated pieces together. Some use a permanent seal, while others use a releasable bond or tack for sealing the two parts. But regardless of the method and/or means used for inside sealing, the seal is always made on the inside surfaces where the actual seal itself is not visible. Thus, when the consumer wishes to unseal the package, he is literally operating "in the dark." Deviations from the planned, orderly, unsealing procedure structured into the package by its manufacturer may occur inside the package where it can break and rip apart unseen, and in a manner to injure any package contents that are frangible.

It is this unsealing, this package-opening, of the prior-art packaging that has left much to be desired; particularly for my embossed frangible-surfaced butter. But, even more universally, the un-sealing practices of the prior-art blister packaging has been, and is, a continuing problem. All of it, individually and/or combined, falls considerably short of giving the consumer a (1) simple, (2) easy, (3) positive, and (4) "foolproof" method and/or means for accomplishing this unsealing, package-opening, and removal of the package's contents. The need for a method and means that will accomplish all four of these ideal characteristics is a continuing problem in this art. Each of these four desirable package values, therefore, becomes an objective of this invention.

In addition to these four objectives, the package for my embossed butter preferably should maintain its blister part intact for use in covering left-over portions of butter stored in a home refrigerator. It is therefore a fifth, and correlative, objective to accomplish the overall four-part objective to keep the opened blister part of the package intact so it may be used to cover left-over portions of my embossed butter contents.

The prior-art generally lacks the simplicity for package-opening that is always an ideal requirement for good consumer acceptance. Most of the prior art lacks this simplicity in both instructions and procedures. Few very, if any, can describe in three words, or less, the opening procedure to follow. And the procedure itself can rarely, if ever, be accomplished with a single movement. It is an object of this invention, therefore, to provide a construction and tear-opening closure for blister-type packages that is simple to understand (can be in instructions of three words) and perform (can be accomplished with a single movement).

The prior-art also is lacking in ease in opening. Most of it involves either considerable struggle, irritation, package breakage, and/or the use of such implements as knives or scissors in order to open the package. This kind of opening carries with it an inherent threat to the surface integrity of surface-decorated surface-frangible items such as my embossed butter, cakes, pies with toppings, etc.; a threat which effectually stops me from trusting my embossed butter to be marketed in such packaging.

It is thus a further object of this invention to provide a method and means for opening sealed blister-type packages with simple, easy, hand-movements, and without the need for using any other means.

The prior art also lacks a positive, predictable, opening action. Most of it is designed with such devices as pull-tabs; allegedly precision-placed releasable adhesives or inside-surface releasable bonds; score lines for hopefully-positive-directioned tearing; etc.; all in an attempt to provide simple, easy, positively predictable opening actions. The various components and structurings comprising prior-art blister packaging, such as the plastic material used for the top part blister, the substrate paperboard, the inside adhesive coatings, the
depth and/or the continuity of score-lines, the permanence (or lack of it) of the inside seal between top and base, etc., all have either inherent or manufactured variations that render such packaging neither positive nor predictable for proper opening for frangible-surfaced items.

Therefore, it is a further object of this invention to provide a method and means for opening blister-type packages that is simple, easy and predictably positive in its opening actions.

The prior art also lacks foolproofness. The marketplace has all kinds of consumers who, for any one of several reasons, act foolishly when opening packages. This is a common complaint of food manufacturers. Yet food packaging, to be thoroughly acceptable must function well even with those consumers who are liable to act foolishly, hastily, and/or recklessly when opening a package. This is especially important with a delicate-surfaced item like my embossed butter.

Regardless of all the various devices built into blister-type packages for opening them, few, if any, are totally foolproof. Instructions may be too complicated to be read quickly and/or easily; the steps to follow may not be physically visible and/or apparent; the built-in structured features may fail to operate as planned by the manufacturer; low-cost, high-speed, manufacturing methods may not be always sufficiently accurate or positive to assure and insure perfect opening results, etc. And so few, if any, of these prior-art blister-type packages provide the consumer with a fool-proof method and means for opening the package with its parts intact.

It is thus the all-encompassing five-fold objective of this invention to provide a structure, method, and means for sealing and then opening a blister-type package that is simple, easy, positive, and foolproof for consumers to use, so that, too, its blister may be used intact as a cover for left-over portions of such consumable contents as butter and margarine.

GENERAL DESCRIPTION OF THE INVENTION

In observing the prior art I noted that all blister-type packages use inside sealing to accomplish a bonding together of the top and base portions of the package. This immediately subjects such packaging to two actions that have contributed much to their failures in the opening operation: (1) the inside surfaces are not open and visible to the user’s eyes whereby corrective measures can be taken if the opening functions are not proceeding according to directions and (2) the proper functioning of the various built-in opening features are contingent on the variables inherent in both these features and in the materials on, and/or, in which such features have been structured.

It became, therefore, another object of this invention, to eliminate these two failure-contributing actions by bonding and/or sealing the two pieces of a blister-type package from the outside, and without dependence on surface variables of the different materials used for blister packaging.

But this objective was, on its face, initially a contradiction in terms. Sealing two pieces of anything together normally envisions the two pieces facing and touching each other on their bonding sides, i.e., their inside surfaces. It is not obvious that two pieces can be sealed or bonded together on sides that do not face and/or cannot touch each other. And yet it is just such a non-obvious, contradictory, means that I have discovered.

In implementing this discovery in its preferred embodiment, this invention makes use of the following two well-known elements in the packaging art:

1. The use of a pressure-sensitive adhesive, tearable, plastic-film tape for bonding together relatively stiff, rigid, pieces of packaging.

   Such a tape has a pressure-sensitive adhesive coating of a character that bonds non-moisture absorbent surfaces such as those usually found in blister-type packages formed from thermoformed plastic sheets and/or moisture-impervious coated paperboards. Also, it would be made from films that have an amorphous, non-grain, body that permits tearing in any direction without resistance from a grain. One specific of such tapes is made by Minnesota Mining & Manufacturing Company under the name “Scotch” tape using a “Paklon” film which is an unplasticized polyvinyl chloride. However, usable tapes are available in a variety of films, metal foils, and papers and adhesive coatings, having a variety of functional properties. For the purpose of this invention, it should have at least two properties: (1) easily tearable, and (2) good bonding adhesion to such blister-pack plastic-sheet materials as polystyrene, propylene, and polyethylene.

2. The use of a cut-edge in the tape to provide an entry point at which the tape will start to tear when action is taken to pull the bonded edges of by blister-package apart.

Most packaging films (whether a thermoplastic like polypropylene, or a regenerated cellulose like “cellophane”) used in forming pouches, flexible blister-packs, etc., require a cut or weakened area at an edge in their surfaces in order to start a tear-open action easily and effortlessly. Most of them cannot easily be torn open without such a start. Therefore, the prior art normally structures a small score-cut or thru-cut into the films at the edge of such a package to effectuate the tear-open function.

In addition to the preceding two prior-art functional elements, this invention further combines the following five new, hitherto unused, cooperating elements to provide the structures and functions that produce the solutions to the problems of the prior art:

1. The use of the outside, visible, surfaces of the extended, contiguous, perimetricaly-matching and mating, relatively rigid, edges of a two-piece straight-sided, multi-cornered, or circular-shaped, blister-type package over and around which surfaces a pressure-sensitive adhesive tape is skip-bonded; the skip-bonding being produced by the natural structuring and functioning of these several elements making up this package arrangement.

Heretofore, pressure-sensitive tape has not been used for bonding the extended edges of the two parts of a blister-type package together. Those skilled in the art apparently did not see how such taping could be used to facilitate (rather than hinder) a simple and easy un-taping or opening of the package. But in considering the problems of prior art packaging, I discovered that when a tape is pressure-sealed over and around the extended facing edges of a blister-type package, the extreme outside edges of the extended edges come together in a manner that leaves a fine hair-line opening in what is supposedly a continuous covering and contacting seal; actually the tape does not enter and/or
have a continuous sealing contact with either of the two facing package parts. As the tape is sealed over and around the two facing, but non-butting or superposed, leading edges of the extended edges, it skips over the fine-line opening between these edges, leaving a line along which the tape is out of sealing contact with these edges.

Here then is a new discovery (skip-bonding) which has not heretofore been utilized in the natural (not contrived) art of sealing the extended edges of a blister-type package; an element which, until this invention, has escaped the notice of those skilled in the art.

2. The use of this skipped-contact hair-line along the outer edges of the two extended edges to provide a very thin straight-line area along which a line of least resistance is provided for easy teasing and severing of the tape during an unpackaging operation.

Where the tape is in bonded contact with the exterior surfaces of the extended edges, any action designed to separate the two edges along such surfaces would meet with an almost impossible-to-overcome resistance; there would be two facings of adhesive-coated tape, plus the two extended (plastic-sheet plus paperboard) edges, plus the bonding action of the adhesive to overcome by use of the strength in a woman-consumer’s hands. However, at the hairline, where the tape and its adhesive is out of contact with both of the extended edges, resistance to any action designed to separate the two edges is at a minimum; only the tape and its adhesive offers resistance, and both of these elements are, for practical purposes, virtually non-resistant to a gentle pulling action from a pair of human hands.

Therefore, in failing to note the possibilities inherent in the natural skip in the bonding structure provided by outside bonding of the two extended edges, the prior art also failed to note that such structuring could provide a line of low resistance along which pressure-sensitive tape can be easily torn apart.

3. The use of cut-off taped-corners or open un-taped corners of angular-shaped packages, and the use of finger-tip-shaped cut-outs of the edges of circular-shaped packages, to provide easily-visible, easy-opening, two-way starting points for tearing the bonding tape apart and thus opening the package.

The sealing together of two films to form a bag-like or pouch-like closure for certain contents (e.g., cold meats and snack foods) is old art, and then providing a cut thru the two sealed films, as a starting point for a tear-open action, is also old art. But such cuts provide only a starting point for a single un-directed line of tear for both films so that the package closure itself is literally torn to pieces.

In the preferred embodiment of my invention the initially-taped corners of my straight-sided, polyanular edges are completely cut off. In doing this I cut thru not only two thicknesses of taping film, but also the two materials forming the extended edges of my blister package. These cut-off corners open up (1) entry slots for the insertion of a consumer’s finger-nails, and (2) a two-way starting point for severing the bonding tape, so that as the consumer pulls apart any one of the cut corners the tape will tear apart simultaneously along two of the poly-sided extended edges.

Optionally, I can just-partially tape the extended edges; leaving my corners un-taped so that entry slots for finger-nail opening would be thereby provided. However, I prefer the cut-corner embodiment for this invention because it eliminates sharp square corners that may injure fingertips.

Optionally too, when taping the extended edges of either polyangular or circular-shaped packages I can provide a semi-circular shaped (or fingertip-shaped) notch or cut-out into which finger-nails can be inserted to start the pull-apart and severing of the bonding tape. However, here again, I prefer to corner-off what otherwise would be circular shaped edges because tearing open from corners is somewhat easier than tear-opening at circular edges.

4. The use of the relatively rigid, extended, and taped edges as positive, tape-cutting, guidelines for predictable-directioned shearing and severing of the taped, bonded, package edges.

As the cut corners of my package are pulled apart the tape will sever along the line of least resistance, aided and abetted by the relatively rigid, edges of the two parts of the blister package. As these edges have pulling-apart pressure exerted on them, the bonding tape becomes bonded even tighter than its normal adhesive qualities alone would provide because the pressures exerted on the bonding tape (by virtue of it being outside bonded) is toward and against the outside surfaces of the extended edges, not away or apart from these surfaces; toward a tighter pressure-produced contact rather than a looser pressure-relieving contact. Consequently it becomes a practical hand-operated impossibility for the bonding tape to jump out of, or away from, tearing along the line of least resistance; i.e., along the extreme outer edges of the extended edges, at the point where the tape is skip-bonded. Consequently, too, these rigid edges with a pulling-apart pressure exerted on them, develop a cutting action against which the skip-bonded fine-line opening of the otherwise-bonded tape shears and severs itself.

5. The use of the four preceding elements and the functions provided thereby to enable the tape-tear guided line to proceed even thru and past any number of angled (acute and/or obtuse) package corners, or along a continuous circular line of tear.

In the prior art on blister-type and pouch-type packages there is normally only one starting point from which to begin the package-opening operation. If the opening is not started at this particular point the opening operation, if it is done by hand without any accessory implements, can only result in a broken, mangled, package which then cannot be used to cover left-over portions of the package’s original contents (an advantage which is particularly desirable with perishable foods such as those envisioned for use with this invention).

By using the four preceding new elements and functions I can offer the consumer such options as (1) starting the packaging opening at any one of the several corners and/or cut-out edge positions of the package, which ever one is most convenient for her, and (2) separation of the two parts either partially or completely; either one of which will still provide a good container for which to store left overs. If she opens it partially (e.g., by leaving one edge still bonded) she can then use one edge as a hinge to open and re-close the package (with the two parts still in covering-alignment due to the retention of the one bonded edge), and using this method of protecting un-used portions; or if she separates the parts completely she can use the blister part for covering the un-used portions on a saucer.
With these seven combined and cooperating elements structured into a blister-type package I have been able to achieve the highly desirable commercial results of providing both positive, protective, sealing and/or bonding together of the two main parts of a blister package, and a simple, easy, positive, and "foolproof" methods and means for the un-bonding and intact package-opening of; and undamaged removal of, surface-fragile contents from such a package; and at the same time retain the blister portion of the package intact for covering left-over portions of the original contents.

DETAILED DESCRIPTION OF THE INVENTION

The invention will be explained in conjunction with an illustrative preferred embodiment shown in the accompanying drawings, in which

FIG. 1 is a perspective view of a package formed in accordance with the invention;
FIG. 2 is a side elevational view of the package of FIG. 1;
FIG. 3 is a top plan view of the package;
FIG. 4 is an enlarged fragmentary sectional view taken along the line 4—4 of FIG. 3 with the contents omitted;
FIG. 5 is an enlarged fragmentary sectional view taken along the line 5—5 of FIG. 3;
FIG. 6 is an enlarged fragmentary view of the lower portion of the package of FIG. 2;
FIG. 7 is a perspective view showing the package being opened;
FIG. 8 is another perspective view showing the package in the process of being opened; and
FIG. 9 is a side elevational view showing the blister top separated from the base along three sides thereof and being hingedly rotated about the fourth side to expose the contents of the package.

Referring now to FIGS. 1—5, the numeral 10 designates generally a blister-type package which is particularly suitable for enclosing articles having highly-fragile surfaces such as embossed butter pads and the like. The package includes a top or blister part 11 which is conventionally formed of plastic, and a bottom or base part 12 which is conventionally formed of fiberboard, plastic, or the like.

The blister part 11 includes a raised dome or cover portion 13 and a generally planar edge portion 14 which extends outwardly from the cover portion of which terminates in a plurality of straight outer or side edges to provide the outer edge portion 14 of the blister part with a generally polygonal outer periphery. The base 12 also includes planar outer edge portions 15 which are provided with straight side edges which provide the base with a polygonal outer periphery. The central portion of the particular base illustrated is coplanar with the outer edge portion 15 thereof, but it will be understood that the central portion of the base could be raised or lowered from the outer edge portion to decrease or increase the size of the enclosure 16 which is formed by the package.

The outer peripheries of the blister part 11 and the base part 12 have the same configuration so that the side edges thereof can be aligned when the blister part is superposed on the base to bring the planar edge portions 14 and 15 into superposed, parallel, mating relationship. After the two parts are superposed and the edges thereof aligned, a strip 17 of pressure-sensitive adhesive tape is applied along each of the mating sides of the package so that the tape extends from the outside, or upper, surface of the outer edge portion 14 of the top, around the outer side edges of the top and base, and over the outside, or lower, surface of the base 15 (FIG. 4). It will be appreciated that no matter how firmly the outer edge portions of the top and base are pressed together when the tape is applied, a fine line or hair line will be present at the outer side edges where the inside surfaces of the outer edge portions come together. The tape has nothing to seal against where this hair line occurs and a skip seal is thereby provided between the inside surfaces of the top and bottom.

The tape is applied along each of the outer side edges of the package and extends between adjacent corners or edge junctions of the polygonal or polyangular configuration. Thereafter, one or more of these corners is cut off as shown at 18 (FIG. 3) to expose the outer edge portions 14 and 15. The cut is made through the upper and lower layers of tape which overlie the outer surfaces of the edge portions 14 and 15 and through the outer edge portions themselves to provide the outer edge portions with exposed cut edges 19 and 20 (FIG. 5). The particular package illustrated has a rectangular outer configuration, and each of the four corners are cut off. It will be understood, however, that other configurations could be used, and that more or less cuts could be made.

Even though portions of the tape and the outer edge portions of the top and base are cut off, the enclosure 16 of the package is maintained in a substantially sealed condition by virtue of the substantial extent of the mating planar edge portions which are held together by the tape. Accordingly, the package may be used to enclose food products such as butter and the like with little or no probability of spoilation of contamination.

When it is desired to open the package, the consumer can insert a fingernail between the cut outer edges 19 and 20 of the outer edge portions 14 and 15 to separate the inside surfaces of these outer edge portions. A fingernail of the other hand can then also be inserted and a separating force can be exerted on the outer edge portions of the top and base as shown in FIG. 7. The skip seal along the hair line between the top and base provides a very thin straight-line area along which a line of least resistance is provided for easy tearing and severing of the tape, and the relatively rigid straight side edges of the top and base provide positive, tape-cutting guide lines for predictable-directed shearing and severing of the tape. The tape is easily severed along a substantially straight line 21 (FIGS. 7 and 8) as the edge portions are pulled apart to separate the tape strip 17 into an upper half 17a which remains bonded to the outer edge portion 14 of the top and a bottom half 17b which remains bonded to the outer edge portion of the base.

The top and base can be continued to be pulled apart until the tape strips are severed along enough of the side edges to permit the contents of the package to be removed, or the tape can be severed around the entire periphery of the package to permit complete removal of the top from the base. Referring to FIG. 9, the tape strips 17 along three of the outer side edges of the package have been separated, and the tape strip 17' along the fourth edge is maintained substantially intact to permit the top to be hingedly swung away from the
base about the hinge line 22 provided by the tape to expose the embossed butter pat 23. A desired portion of the package contents can be removed, and the top can thereafter be swung about the hinge line 22 to recover the contents. Since the top and bottom are separated along the tear line 21 which is made in the tape, both the top and the base remain intact to perform their sealing functions. Even if the blister top is completely removed from the base, the top remains intact and can be replaced on the base to reenclose the contents or can be used in combination with a saucer or plate to reenclose the contents.

The ease with which the package can be opened permits instruction of the consumer with a minimum of direction. For example, merely the words "peel back" or "peel back corner" or the like need be imprinted on the package adjacent one of the cut areas.

While in the foregoing specification, a detailed description of a specific embodiment of my invention was set forth for the purpose of illustration, it will be understood that many of the details hereinafore may be varied considerably by those skilled in the art without departing from the spirit and scope of the invention.

I claim:

1. A method for packaging items in a blister-type two-part package providing a product enclosure, said two parts including mating, matching, peripherally contiguous, multiple-cornered, straight edge portions extending outwardly from said enclosure, comprising superposing the two parts with an item to be packaged therebetween and aligning said straight edge portions in unsealed relationship whereby a hairline opening is provided between the edge portions, bonding said edge portions together around the entire periphery of the package with an adhesive-coated tearable tape over around and under the edge portions in a continuous manner whereby a skip-seal is provided between the superposed edge portions, cutting off at least one of the corners of said taped edge portions to provide an easy-starting tear point for severing said tape and separating said edge portions and said parts, said tape-sealed edge portions acting as positive predictable guidelines along which said tape will shear when said two parts are pulled apart.

2. A method of packaging and unpackaging an item packaged in a preformed blister-type package wherein said package is constructed from two pieces forming an enclosure area for said item and has straight-sided, polyangular edge portions extending outwardly from said enclosure area of both pieces comprising superposing the two pieces with said item therebetween so that the edge portions thereof face each other in a mating, matching, peripherally-contiguous, but unsealed relationship, whereby a hairline opening is provided between the edge portions and bonding said edge portions together around the entire periphery of the package with an adhesive-coated tearable tape, said tape continuously covering said edge portions over, around and under thereof in a skip-sealed relationship, cutting through said taped skip-sealed edge portions at their original corners to change their relationship from one that is sealed together to one that is simply bonded together and thus providing cuts in the formerly taped corners for easy-starting tear-points at which to tear said tape apart, and then pulling said edge portions and said pieces apart beginning at one of the cuts and along the two-way directioned line of tear along said skip-seals of said bonded edge portions.

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