

Sept. 11, 1962

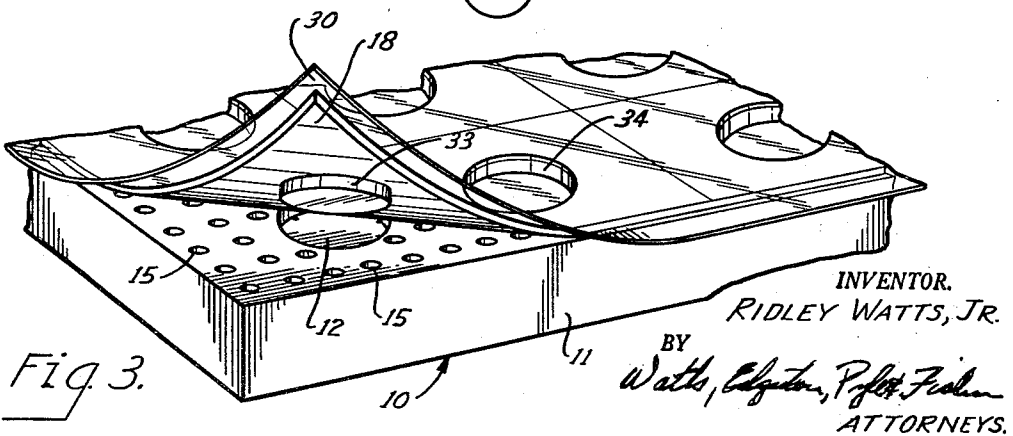
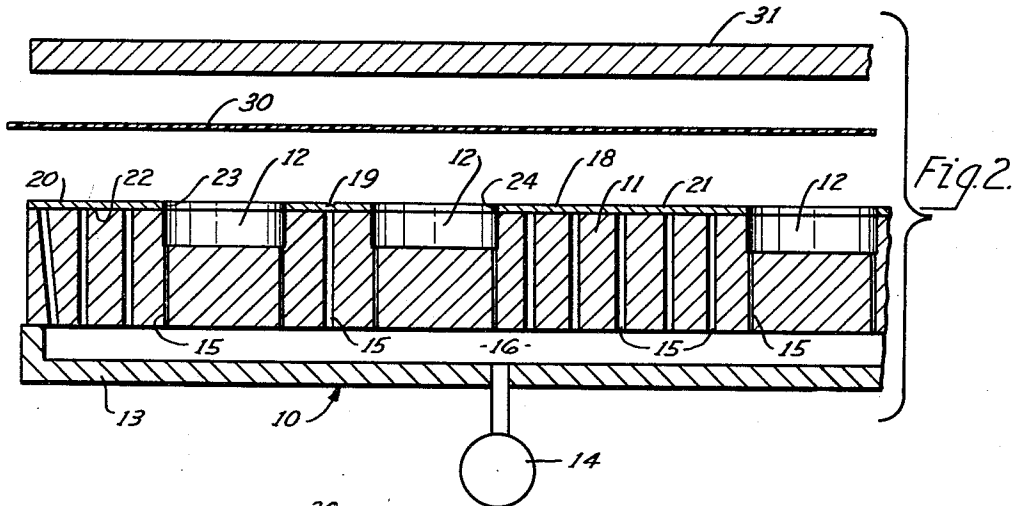
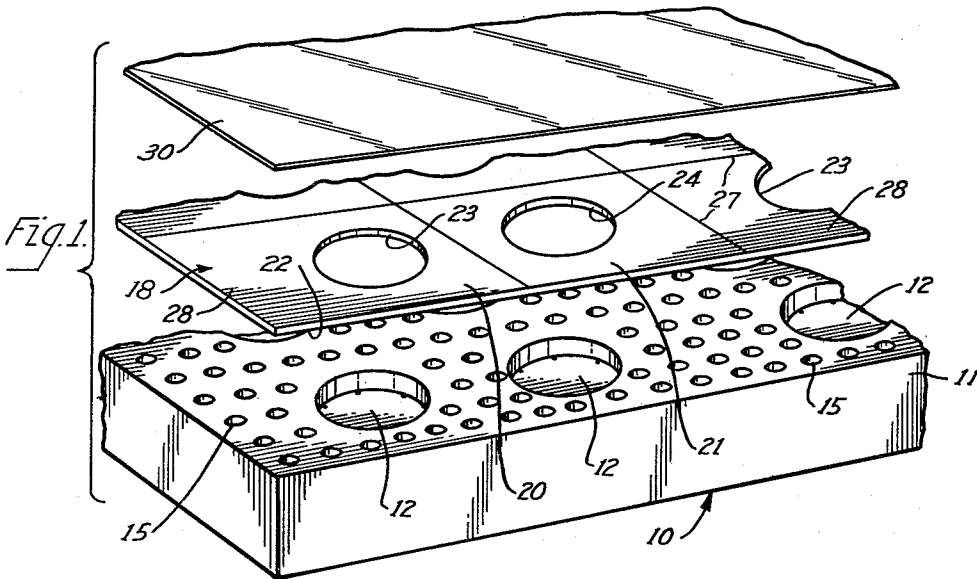
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3,053,023

PACKAGE AND METHOD OF MAKING SAME

Filed March 23, 1961

2 Sheets-Sheet 1



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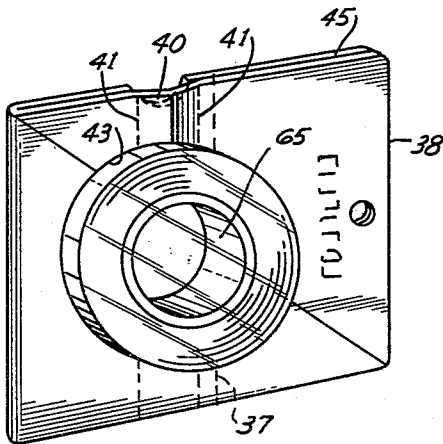
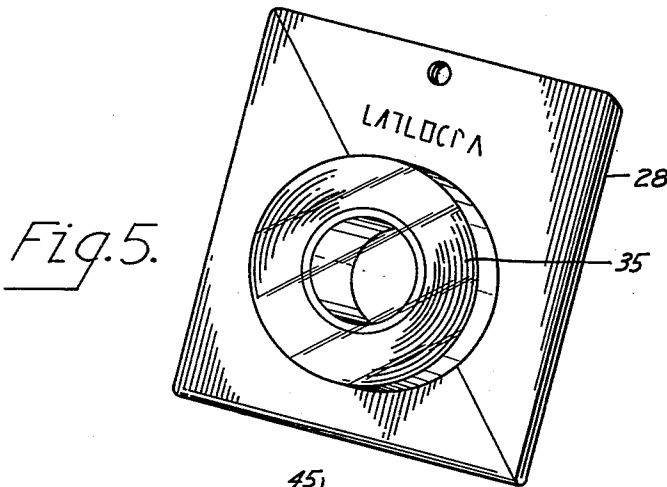
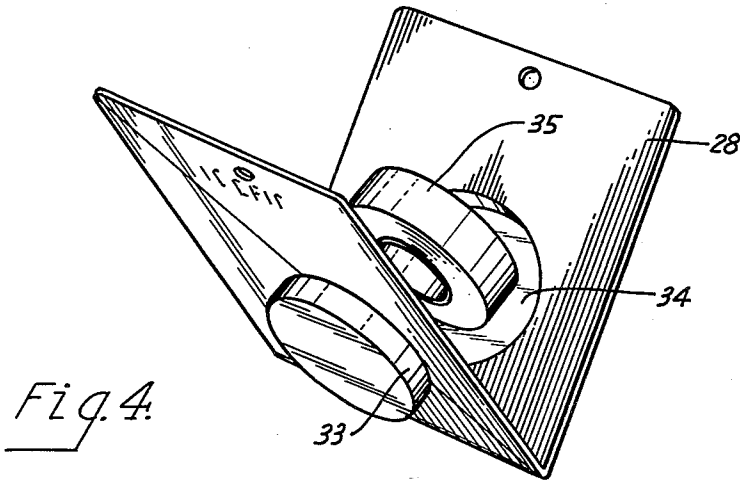
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PACKAGE AND METHOD OF MAKING SAME

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2 Sheets-Sheet 2



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PACKAGE AND METHOD OF MAKING SAME
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13 Claims. (Cl. 53—30)

This invention pertains to packaging articles and more particularly to a display package and a method of making such a package.

In present day merchandizing, many articles are packaged in separate units. Retail products are often packaged in separate units in order to show the products attractively against a display background, which can contain art-work, illustrations of use, trademark, and price. Packages for separate units facilitate self service sales, serve as protection in shipment and deter pilferage.

In packages which accomplish this type of display, each unit of articles to be sold is mounted on an individual display card. This unit is covered with a transparent plastic material which fixes it to the display card. A number of types of packages have been developed which fall in this general class of display package. Presently, the two most popular types are known as "skin" packaging and "bubble" packaging (sometimes referred to as blister packaging). Shrink packages are another type falling within this general class.

In "bubble" packaging a cup, contoured to the shape of the product, is molded from relatively heavy plastic film. This cup, known as a bubble or blister, provides a cavity of sufficient size to receive the product to be displayed. The bubble is formed with a peripheral flange so that it can be attached to a display card, either by heat sealing to the face of an adhesive treated card or by being held within a folding card containing an aperture which permits the bubble to protrude from the face of the card while gripping it by its flange.

Bubble packaging is costly for several reasons. One of these is that a rather high-grade and heavy gauge transparent plastic material is required because the bubble must be relatively rigid. Another reason is that bubbles are bulky and, thus, expensive to ship and store because of the excessive space required. In addition, the process of packaging a product in a bubble package is relatively slow and time-consuming.

The more recently developed skin packaging is more economical than bubble packaging for many products but it, too, has certain inherent drawbacks. With the most common form of skin packaging, an adhesive is applied to the front of a card. The adhesive, after it has dried, is perforated. The article to be packaged is then positioned on the card. A heat softened plastic film is then vacuum drawn down over the article and onto the card to simultaneously form a protective covering over the article and bond the plastic sheet to the face of the display card.

Since, in skin packaging, the heat softened film is drawn down over the article itself, an article which has sharp corners, projections, or undercuts will cause the film to puncture. For this reason it is only possible to skin package relatively smoothly contoured products. Another disadvantage of skin packaging is that a rather substantial amount of processing equipment is required. A manufacturer wishing to skin package its product must either make an inordinant investment in packaging equipment or he must ship his products to a custom packager. Thus, the product manufacturer is faced with the rather distasteful choice of selecting either the expense of putting in packaging equipment or the expense of shipping his product to a custom packager.

Skin packaging is also a difficult operation. Slight variations in temperature, humidity, porosity of board,

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oven heat, and film can cause package failures. Many manufactureres have abandoned skin packaging or refused to use it because of the difficulty of making dependable packages.

5 Shrink packaging is accomplished by stretching a plastic film, while hot and soft, to form a relatively large cavity to accommodate an article. After the article has been positioned in the cavity the film is heated to shrink it into tight abutment with the product. Cost, susceptibility to puncturing, and the complexity of manufacturing, loading, and assembly are all drawbacks which limit the use of shrink packages.

10 The products which can be packaged with skin and shrink packages are limited because the product is contacted, in each case, by the film when it is hot and soft. The product must, then, be a composition which will not be bonded to the film under these conditions. For example, attempts have been made to manufacture skin packages with polyethylene film. The use of polyethylene films has been limited because of its highly adhesive characteristics. Many products cannot be skin packaged with polyethylene because the polyethylene would become bonded to the product itself. There are other reasons why 15 these attempts to use polyethylene have never been fully satisfactory. One is that polyethylene tends to cause the display board to curl. Another is that polyethylene film is relatively highly susceptible to tearing when heat softened and drawn over a product.

20 The present invention provides a new package in which the advantages of skin, bubble, and shrink packaging are incorporated into a single package. In addition, several very positive and additional advantages not provided in any prior package are obtained. With this invention the simplicity and economies even greater than those of skin packaging are obtained. As in bubble packaging, the product manufacturer can package his own merchandise without first making a substantial investment in packaging equipment. In addition, a package of superior appearance is obtained.

25 This package is one in which the product may selectively project from and be visible from either one or both faces of the finished package and yet covered completely by a protective pocket of plastic film. The product is snugly gripped peripherally by the card for support additive to the pocket or pockets. A double-face package is obtained in which both faces are firmly united together over the entire interface to obtain a stronger and more durable package.

30 With the package in which the product projects from both faces, each face can be the front. With this arrangement and the product offset to one side, it is possible to nest the packages in display fixtures and thereby realize substantial space savings.

35 Another advantage of the present invention is that it is possible for the first time to utilize polyethylene film in a manner which overcomes all of the previous drawbacks and in a manner which obtains the advantages of this film. These advantages include cost of the film itself, its chemical stability and the elimination of adhesives.

40 The package of this invention uses a display card of the foldover type. A foldover card is one which is normally printed on its outer face. It is scored for folding. When finished it is folded in half along the score so that the printed outer face forms both the front and the back faces of the finished package.

45 In the double pocket arrangement of this invention a product-receiving aperture is formed in each half of the foldable card. The card is positioned in a mold, face down, with each of the product-receiving apertures positioned over a mold cavity. These cavities are each shaped to define a portion of the contour of a product

to be packaged. A heat softenable plastic film is positioned over the card and heated. The softened plastic film is sealed to the exposed inner face of the card and portions of the film are brought through the product apertures and against the surfaces of the mold cavities. The portions of the film brought against the surfaces of the cavities form pockets which together define a chamber of the contour of the product to be packaged.

The described process and resulting product provide several outstanding advantages. One advantage is that some products which cannot be skin packaged are readily packageable by a package made in accordance with this invention. Products which would become adhered to the package film if skin packaged fall in this category. So, too, do products which have sharp projections or corners which are apt to puncture a skin packaging film.

In addition, some products, such as flash light batteries, are difficult to skin package because each such product has a relatively high surface which projects from the supporting card. A film drawn over a dry cell battery during packaging may be stretched past the breaking point. With the double pocket package of this invention, on the other hand, it is possible to package a product which is substantially twice as thick as the maximum size which can be accommodated with skin packaging. This is true because the product projects from both sides of the supporting card and is encased within two pockets, each of which may be made of film drawn to the maximum safe amount.

Sharp corners, projections, and the like, may be further accommodated in this invention by modifying the mold so that the cavities do not exactly conform to the shape of the product to be packaged. Rather, the cavities are rounded at all sharp corners and the like so that the product will, in the area of protrusions or sharp corners, be loosely accommodated in the blisters. With a cavity rounded in this way, punctures caused by difficult shapes are avoided.

It should also be noted that in the described product and process the product is characterized by the absence of adhesives. This is obtained by utilizing a film, such as polyethylene, which will bond both directly to the supporting card and to itself. It is possible to use this package with a wide variety of products because the film never contacts the product when the film is in a hot and heat softened condition. It is also possible to do this and still provide a superior package because a folded card is used which overcomes the tendency a film of this nature might have to cause curling or buckling of the supporting card.

After the film has been applied to the board, the pockets have been formed, and the card stripped from the mold, the product is placed in one of the pockets, and finally, whether the card has been made in two separate halves or in one foldable unit composed of two halves, the inside faces of the two halves are then brought together and heat sealed to one another to complete the package.

One of the unique features of this invention is that it is possible to provide a tear strip to facilitate removal of the product from the package. This is not possible with any of the described prior packages. Here the card has parallel perforations from one side edge to the aperture. The interface between the card halves is not sealed in the region of the tear strip. To remove the product one simply grasps the tear strip and pulls, simultaneously removing the tear strip and tearing the film. The tearing of the film is continued until the pocket is sufficiently separated to release the product.

This new package and the method of making it have a number of advantages in addition to those which have been described. The manufacturer of a product to be packaged can purchase a complete package which is ready for enclosure of his product. The printed card and the plastic cavity for receiving the product, or pocket, as it

may be referred to, are one integral unit. There is no complicated packaging assembly and no requirement for complex sealing equipment. The loading of the package is simplified as is the sealing to facilitate efficient packaging. The packages can be stored compactly and neatly in a minimum amount of space. They require a minimum amount of handling.

One of the greatest practical advantages of this invention is that the inventory of the products to be packaged can be reduced. With prior packaging techniques, it was important to package large groups of products at one time to obtain economies and efficiencies. The present package, on the other hand, readily lends itself well to both the packaging of a few units at a time and to packaging large numbers of units with a completely automated packaging line. If products are packaged differently for different channels of distribution, they can be packaged quickly and efficiently as orders are received as opposed to the prior practice of prepacking relatively large numbers of units for each channel of market distribution. Similarly, since there is no need to ship products to a custom packager, the inventory requirements are reduced. The ability to package in small quantities just prior to shipment is also very important in the case of products with poor shelf life. Such products can often not be run in large quantities and held for several weeks or months.

As the preceding discussion suggests, the objects of this invention are to provide a novel and improved package and method of package manufacture.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is an exploded schematic view showing a mold, the sheet stock used to make the packages of this invention, and a sheet of thermoplastic film;

FIGURE 2 is a sectioned exploded view showing sheet stock positioned on the mold, a heater element, and the thermoplastic film positioned for heat softening and connection to the sheet stock;

FIGURE 3 is a perspective view showing the mold with plastic film connected to a plurality of positioned cards and the stripping of the sheet commencing;

FIGURE 4 is a perspective view of the completed card showing the product being inserted;

FIGURE 5 is a perspective view of a finished package; and,

FIGURE 6 is a perspective view of a package with a tear strip.

Referring now to the drawings and to FIGURE 1 in particular, a mold is shown generally at 10. The mold includes sheet supporting platen 11. The platen 11 has spaced pocket forming cavities 12. The cavities 12 are, in the disclosed arrangement, mold forms which are arranged in pairs. A vacuum manifold 13 is connected to the underside of the mold 10. A vacuum source 14 is connected to the manifold 13. A plurality of vacuum passages 15 connect the platen 11 including the mold cavities 12 to a manifold defined chamber 16 which is in communication with the vacuum pump.

In the drawings, the article being packaged is a roll of tape. As is customary, this roll is an annular member of cylindrical configuration. Since the overall configuration of the tape is a cylinder, each of the cavities 12 is substantially the same as that of the roll of tape. The depth of each of the cavities 12 is equal to one-half of the thickness of the roll of tape less the thickness of the card stock 18 and film 30.

The provision of a cavity of a dimension equal to that of the product assures a tight finished package even though there may be some variation in the dimension of rolls of tape. The finished package will be appropriately sized to receive the minimum size roll of tape. A roll of tape of the largest size permissible

within the range of tolerances will rely on the inherent resiliency of the plastic film to permit insertion in the formed pocket.

The card stock 18 is separable along cut lines 27 to provide a plurality of cards 28. Each card 28 has a central transverse score 19 which divides it into halves 20 and 21. The scores 19 of the type disclosed are formed on the inner face of the card stock 18 opposite an outer or message bearing face 22. This message bearing face 22 has decorative and informative printing on it.

The card stock 18 has pairs of product-receiving apertures 23, 24 formed respectively in the first and second halves 20, 21 of the card. These apertures 23, 24 are positioned on opposite sides of the central score 19.

When a package is to be formed, the card stock 18 is positioned on the platen 11. The sheet stock is positioned with its outer or printed face 22 down and against the mold. The card stock is also positioned so that each of the apertures 23, 24 is oriented over a corresponding one of the cavities 12.

Next, the heat softenable plastic film 30 is positioned above the mold. The film 30 is softened by heaters 31, FIGURE 2. After the plastic film 30 has been exposed to the heaters 31 for a predetermined period of time it is draped over the card stock 18. Then, the source 14 is actuated to create a pressure differential. The pressure differential presses the plastic film down tightly against the positioned card stock 18 and against the walls of the cavities 12. This firmly bonds the film 30 to the card stock 18. Simultaneously, portions of the film are drawn through each of the apertures 23, 24 to form corresponding pockets 33, 34 in the cavities 12. A pair of these pockets 33, 34 together define the contour of the unit to be packaged.

This simultaneous bonding of the film to the card and formation of the pockets is an outstanding advantage which has not previously been obtained. Clearly, less expensive materials and less steps are required than with bubble packaging. At the same time, the versatility, appearance, and strength equal or superior to other packaging are obtained at cost less than all prior packages of this class.

After the pocket forming step of FIGURE 3 has been completed, the film 30 and the positioned sheet are stripped from the mold. The sheet is then die cut into individual cards. The score 19 may be formed by this die cutting operation rather than at the time the apertures 23, 24 are formed. The cards may be prefolded and partially sealed. The packages (either flat or folded) are stacked, collapsing the pockets, packed in suitable containers, and shipped to the product manufacturer.

As his first step in packaging, the product manufacturer will press his unit consisting of one or more products sold into one of the pockets. The unit, again a roll of tape in the drawings, is designated by the numeral 35, in FIGURE 4. In the example shown, the roll 35 is first positioned in the product-receiving aperture 23, and as the roll 35 is pressed through the aperture 23 and into the pocket 33, the product will shift the pocket outwardly from its flattened condition to reassume its molded shape. Next, as is suggested by FIGURE 4 and the preceding description, the fold along the score 19 is completed to bring the inner faces of the halves 20, 21 into abutment with one another. This positions the product in the second pocket 34, distending it to its original and molded shape. The abutting inner faces of the two halves are then heated and pressed to seal the two together. This heat seal will be over the entire interface between the abutting two halves of the film so that the card is firmly and integrally bonded together. When the heat seal of the film to itself is performed, the seal of the film to the card will be improved simultaneously and any defects along the film-card interface will be corrected.

One of the outstanding advantages of the invention is best understood when one considers that polyethylene film may be used without any of its prior drawbacks. The package produced is stronger, more attractive, and more versatile than previous packages and yet less expensive and simpler to make. In addition, the packaging of products is obtained more economically and expeditiously than with prior packaging techniques. Further, because the film is drawn into a mold rather than against the product it is possible to package soft products.

Because the product never comes into contact with the film when the film is hot, it is possible to utilize a film which has heat bonding characteristics. The polyethylene film is directly bonded to the supporting card without the use of any adhesive at the interface of the film and the card. In addition, the film is bonded to itself to seal the folded halves of the card together, again without the use of an adhesive. Thus, both interfaces, the interface between the film and the card and the interface between the two folded halves of the film are characterized by this absence of adhesive.

The preferred film is, then, a transparent, flexible, inexpensive thermoplastic film, capable of bonding both to itself and to the card without any adhesive. Polyethylene film has all of these and the other desirable characteristics.

In FIGURE 6, the tear strip of the invention is shown with a single pocket card. There are two halves of the card 18 shown bonded together only from a location approximately designated by phantom line 37 outwardly to outer edge 38 of the finished package. The interface between the fold at the left hand side of the drawing in FIGURE 6, and the phantom line 37 is not bonded together.

In the example shown in FIGURE 6, only a single pocket 65 is provided. It should be noted the package may be one in which the product projects from both faces of the card into a pair of complementary pockets corresponding to the pockets 33, 34.

A tear strip 40 is defined by a pair of perforation lines 41. These perforation lines 41 extend from one edge, the upper edge in FIGURE 6, to the product aperture designated by the numeral 43 in FIGURE 6. The perforations 41 are formed in one half of the card, the half designated by the numeral 45 in FIGURE 6 and corresponding to the half 20 of the other figures.

When one wishes to remove the tape 35 from the package, the tab 40 is grasped and torn free from the remainder of the card. This simultaneously separates the tab 40 from the card and tears the plastic film. A continued pulling of the tab 40 will separate the pocket, allowing the product 35 (a roll of tape) to be readily removed from the package.

While the invention has been described with a great deal of detail, it is believed that it essentially comprises a novel and improved package utilizing a fold-over card. The package includes a sheet of plastic bonded to itself to form a firm bonding connection of one-half of the card to the other. The package also includes a plastic pocket which, together with the card, completely surrounds the product in all directions while permitting the product to be visible from one or both faces of the package. The invention also includes a novel and improved tear strip and a process of making packages.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:

1. The method of packaging at least one article as a

unit comprising, providing a card with inner and outer faces and at least one product aperture, positioning the outer face against a mold with the aperture aligned with a mold cavity contoured to the shape of at least a portion of the unit to be packaged, bringing a heat softened thermoplastic film into abutment with the inner face of the card, bringing a portion of the film through each such aperture and against each such cavity thereby simultaneously bonding the film to the card and forming at least one pocket in the film defining at least a portion of the contour of a unit to be packaged, cooling the film to set the pocket in its distended shape, stripping the card from the mold and allowing the pocket to at least partially collapse, redistending the pocket and forcing the pocket to at least partially assume the contour of the unit being packaged by passing the unit into and at least partially through the aperture and inserting the unit in the pocket, and thereafter closing the back of the aperture to maintain the unit in the pocket.

2. The method of claim 1 wherein the film is directly bonded to the inner face of the card and sealed to the card over the entire interface without an adhesive.

3. The method of packaging at least one article as a unit comprising, providing a card with inner and outer faces and spaced matable apertures, positioning the outer face against a mold with each aperture aligned with a mold cavity contoured to the shape of a portion of the unit to be packaged, bringing a heat softened thermoplastic film into abutment with the inner face of the card to bond the film to the card, bringing a portion of the film through each such aperture and against said cavity to form a plurality of pockets in the film with the pockets together substantially defining the contour of a unit to be packaged, cooling the film sufficiently to permanently set the film in its formed shape, stripping the card from the mold and allowing each such pocket to partially collapse, folding the card to bring portions of the inner face into abutment and register the pockets with the unit encased snugly therein and thereby redistending each such pocket and force the pockets to at least partially assume the contour of the unit being packaged, and securing the card to itself to maintain it in the folded condition.

4. The method of claim 3 wherein the film is directly bonded to the inner face and the card is secured to itself by heat sealing the film to itself over substantially the entire film interface.

5. The method of packaging a unit of at least one article comprising, printing a message on one face of a card, scoring the card, die cutting the card to form a spaced pair of apertures symmetrically disposed on opposite sides of the score, positioning the card on a porous platen with each aperture registered with one of a pair of platen cavities together defining the contour of the unit, heat softening a plastic film, creating a pressure differential on opposite sides of the film to bond the film to the card and move portions of the film through the apertures and against the walls of the cavities to form pockets together generating the contour of the unit, cooling the film sufficiently to permanently set the film in its formed shape, stripping the card from the platen and allowing the pocket to at least partially collapse, positioning a unit in one pocket, folding the card along the score to bring portions of said other face together into abutment and bring the other pocket over the unit to snugly encase the unit in the pockets and thereby redistend the pockets to force the pockets to at least partially assume the contour of the unit being packaged, and securing the card to itself to maintain the abutting portions of said other faces together to complete the package.

6. The method of packaging a plurality of units wherein each unit includes at least one article comprising; forming each package of a plurality of packages by providing a card with inner and outer faces and spaced matable apertures, positioning the outer face against a mold with each aperture aligned with a mold cavity contoured to

substantially the shape of a portion of the unit to be packaged, bringing a heat softened thermoplastic film into abutment with the inner face and a portion of the film through each such aperture and against said cavity thereby simultaneously bonding the film to the card and forming a plurality of pockets in the film with the pockets together substantially defining the contour of the unit to be packaged, cooling the film sufficiently to permanently set the film in its formed shape, stripping the card from the mold, flattening the pockets of each package, placing said packages in a container, transporting the container to another location, removing the cards from the container, and packaging a unit in each package by inserting a unit in one pocket of each card and redistending the pocket to return the pocket to its molded shape, redistending the other pocket to its molded shape by inserting the unit in the other pocket and bringing two parts of the film bonded to such card into abutment with itself, and bonding the abutting film to itself to complete the package.

7. The method of packaging at least one article as a unit comprising, providing a card with inner and outer faces and at least one product aperture, positioning the one face against a mold with the aperture aligned with a mold form contoured to the shape of at least a portion of the unit to be packaged, and bringing a heat softened thermoplastic film into bonding abutment with the other face of the card against each such form thereby simultaneously bonding the film to the card and forming at least one pocket in the film defining at least a portion of the contour of a unit to be packaged, cooling the film to set the pocket in its distended shape, stripping the card from the mold and allowing the pocket to at least partially collapse, redistending the pocket and forcing the pocket to at least partially assume the contour of the unit being packaged by passing the unit into and at least partially through the aperture and inserting the unit in the pocket, and thereafter closing the back of the aperture to maintain the unit in the pocket.

8. The method of claim 4 wherein the film is heated for the heat sealing by passing heat through the card to the film.

9. The method of packaging a unit with a flexible film and a card having at least one aperture adapted to be registered with a mold portion at least partially contoured to the shape of the unit to be packaged comprising;

- (a) heating at least a portion of the film;
- (b) distending the film to form a pocket by forcing the heated portion while hot against the surface of the contoured mold portion;
- (c) cooling the film to set it in its distend condition while maintaining the film against the mold surface;
- (d) bonding the film to the back of a portion of the card;
- (e) thereafter stripping the film and card from the mold and allowing the pocket to partially collapse;
- (f) redistending the pocket and forcing the pocket to at least partially assume the contour of a unit being packaged by passing the unit into and at least partially through the aperture and inserting the unit in the pocket; and,
- (g) thereafter closing the back of the aperture to maintain the unit in the pocket.

10. The method of claim 9 wherein the pocket is redistended and tensioned by the insertion of the unit.

11. The method of packaging a unit with a flexible film and a card having an aperture adapted to be registered with a mold portion at least partially contoured to the shape of the unit to be packaged comprising;

- (a) heating at least a portion of the film;
- (b) distending the film to form a pocket by forcing the heated portion while hot against the surface of the contoured mold portion;
- (c) cooling the film to set it in its distended condition while maintaining the film against the mold surface;

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- (d) bonding the film to the back of the first portion of the card;
- (e) thereafter stripping the film and card from the mold and allowing the pocket to partially collapse;
- (f) redistending the pocket and forcing the pocket to at least partially assume the contour of a unit being packaged by passing the unit into and at least partially through the aperture and inserting the unit in the pocket; and,
- (g) thereafter bonding another card portion to the back of the first card portion to close the aperture and maintain the unit in the pocket.

12. The process of packaging a unit in a package formed from a flexible, pliable film and a card having a face comprising;

- (a) forming an aperture in the card contoured to the silhouette of a unit to be packaged;
- (b) providing a mold of the contour of at least a portion of the unit to be packaged;
- (c) positioning the card on a mold;
- (d) heating the film;
- (e) forming a flexible and collapsible pocket by distending a portion of the film when hot against the mold when the card is against the mold and another portion of the film is against the back of the card;
- (f) cooling the film while the pocket is distended against

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- the mold to permanently set the flexible pocket in the distended condition;
- (g) bonding said other film portion to the back of said card prior to the completion of step f;
- (h) stripping the card and bonded film from the mold and allowing the pocket to partially collapse;
- (i) redistending the pocket and forcing the pocket to at least partially assume the contour of a unit being packaged by passing the unit into and at least partially through the aperture and inserting the unit in the pocket; and
- (j) closing the back of the aperture to maintain the unit in the pocket.

13. The method of claim 12 wherein the pocket is redistended and tensioned by the insertion of the unit.

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