

[54] FREE-STANDING BLISTER PACKAGE

3,203,542 8/1965 Lightner et al..... 206/78 B UX
2,779,462 1/1957 Hoag..... 206/45.34 X

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[21] Appl. No.: 220,594

[57] ABSTRACT

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[51] Int. Cl. B65d 25/54, B65d 73/00

[58] Field of Search..... 206/45.14, 45.34,
206/46 FR, 78 R, 78 B, 80 A; 220/4 E, 31 S;
229/2.5; 248/152

A free-standing package of the blister type includes an article containing enclosure formed of a single piece of self-supporting plastic material. The enclosure is in two mating sections integrally joined along a fold line traversing what becomes the base of the completed package. The free edges of the sections have flanges which meet when the sections are closed to envelop the article and the sections are sealed together along the flanges. At the same time, the initially folded base portion is flattened out to provide a support for maintaining the package article in an upright position. The plastic enclosure may be used with or without a display card.

[56] References Cited

UNITED STATES PATENTS

3,127,993	4/1964	Phipps.....	206/78 B
D222,580	11/1971	Nakakuma	206/78 B UX
D222,581	11/1971	Nakakuma	206/78 B UX
3,375,921	4/1968	Ligon.....	206/80 A
3,554,367	1/1971	Hoover	206/80 A X

11 Claims, 17 Drawing Figures

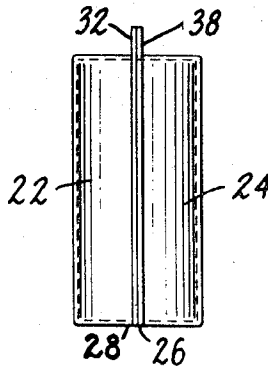
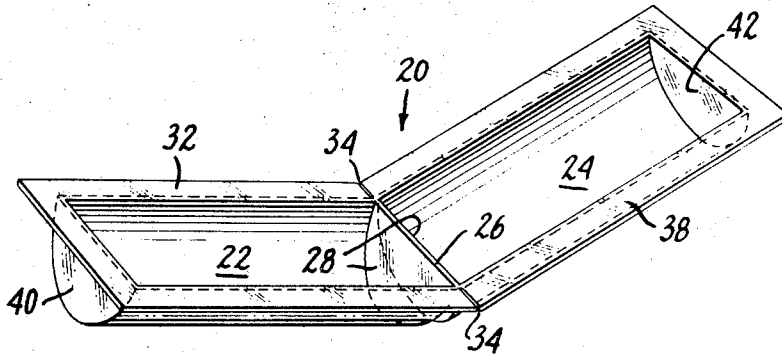


FIG. 1

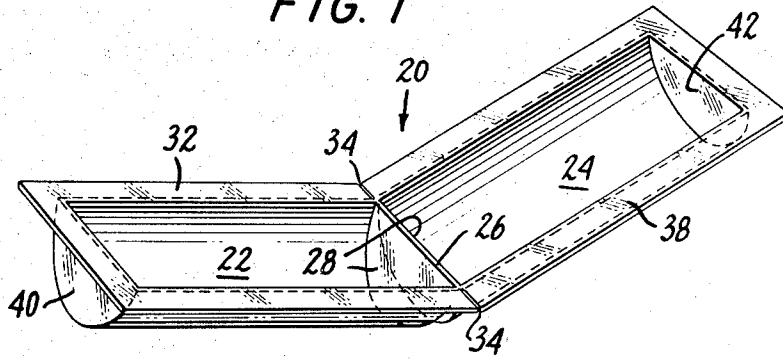


FIG. 2

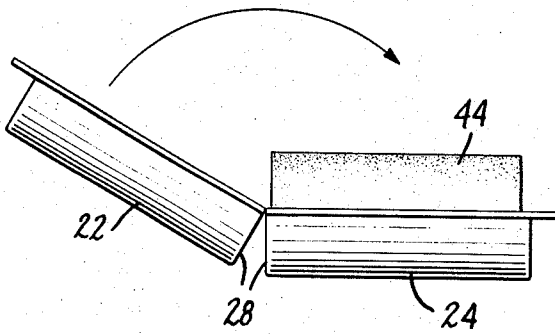


FIG. 3

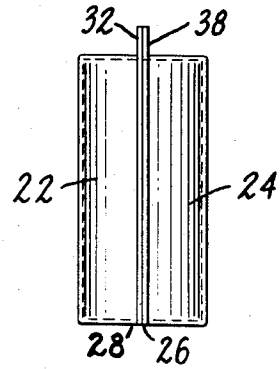


FIG. 4

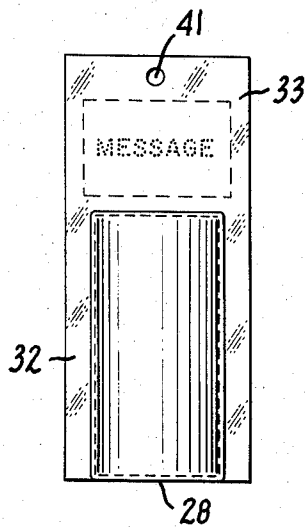


FIG. 5

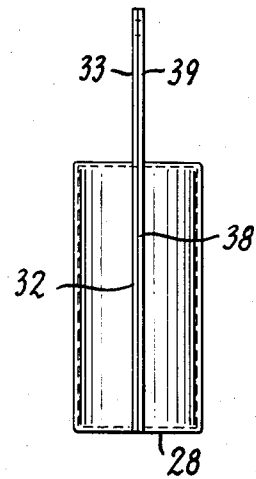


FIG. 6

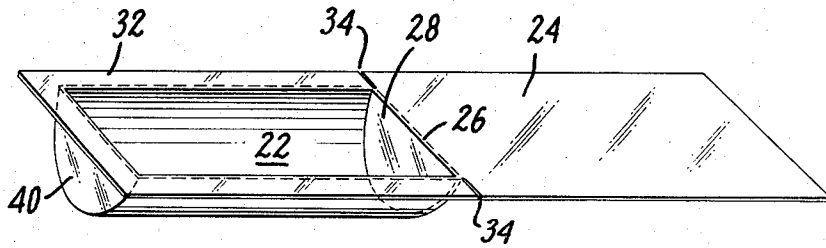


FIG. 7

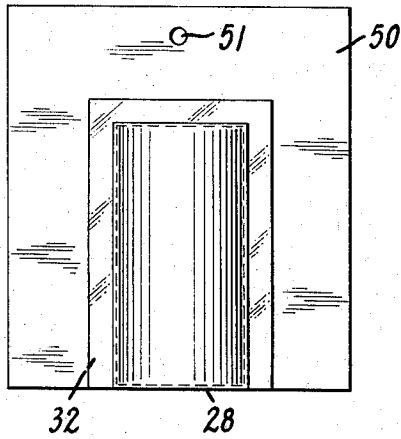


FIG. 8



FIG. 9

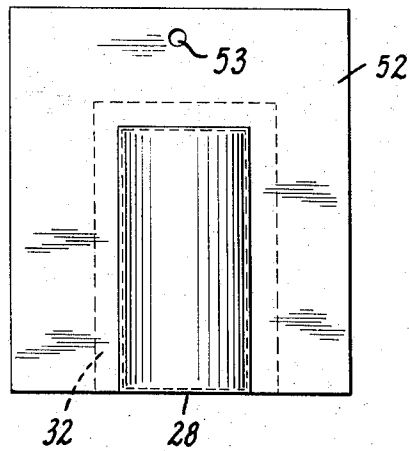


FIG. 10

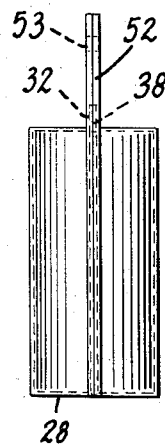


FIG. 11

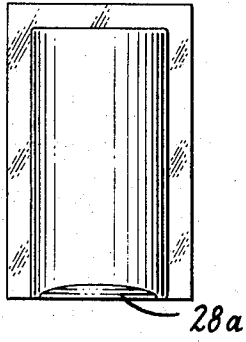


FIG. 12

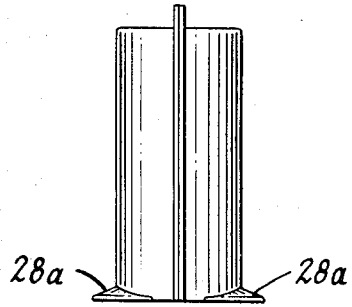


FIG. 13

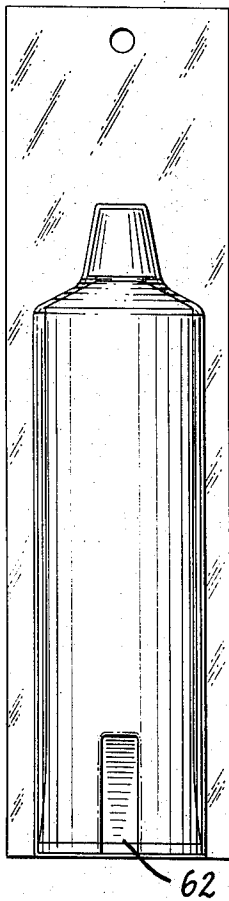


FIG. 14

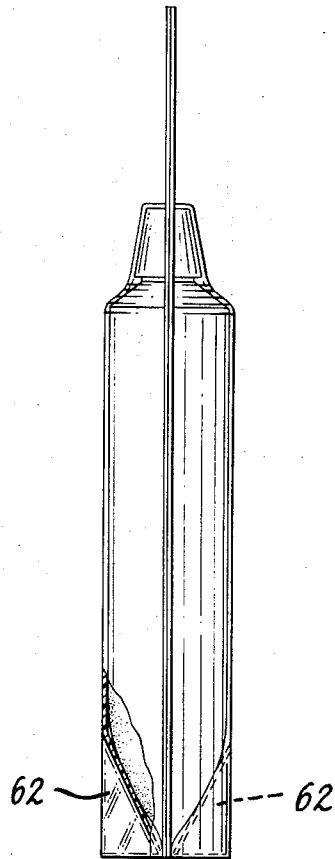


FIG. 15

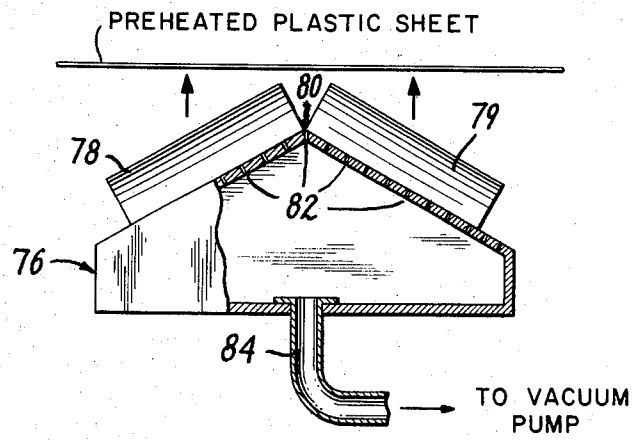


FIG. 16

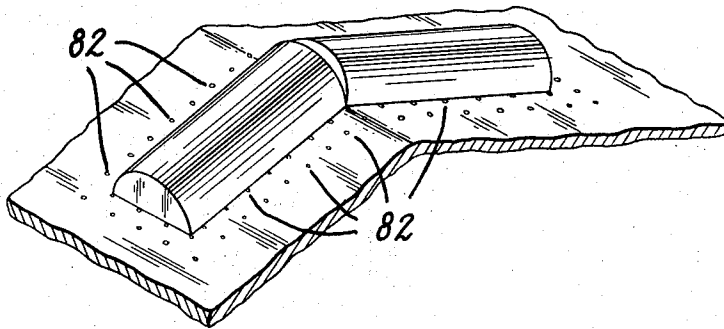
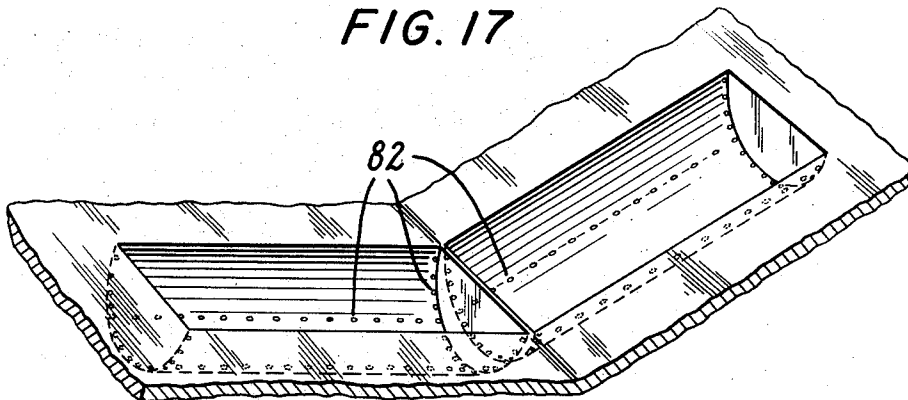


FIG. 17



FREE-STANDING BLISTER PACKAGE

BACKGROUND OF THE INVENTION

This invention relates to the packaging of goods and, more particularly, to a novel, free-standing package of the blister type and its method of manufacture.

In recent years, the marketing of consumer goods has been facilitated by pre-packaging of individual articles or predetermined amounts of bulk material in plastic containers. Such containers are inexpensive yet sturdy and capable of being imprinted with colorful, attractive labels that simplify identification and promote sales.

One type of such packaging that has become popular is that in which the article is enveloped in a transparent plastic skin conforming to its shape and supported by a display card bearing suitable promotional information. This package is produced by first securing a thin film of suitable plastic over an opening, or window, cut in each half of a pre-printed card, forming pockets in the transparent material, inserting the product, folding the card in half with the goods appropriately located between sections of the plastic film, sealing, and applying heat to the plastic to cause it to closely conform to the contours of the enclosed article.

A similar, but somewhat different form of packaging, employing preformed plastic blisters, has also come into wide use. This technique differs from the skin packaging discussed above in that the plastic enclosure for the article is preformed of a plastic sheet material having sufficient thickness to be self-supporting. The preformed blister, with the article enclosed, is then secured to a display card or to a mating blister to completely enclose the article. In either case, it is necessary to provide flanges completely around the periphery of the blister so that the article may be completely sealed against removal and contaminants.

Conventionally, preformed blister packages are made available to the consumer either by hanging them on a hook by means of holes punched in the display card, stacking them in special counter-top racks designed to support the cards, or by loosely piling them in a tray or other receptacle. None of these are entirely satisfactory from a merchandising point of view; it being preferable that the package be capable of standing by itself in an upright position on a flat surface such as a shelf or counter-top. In the case of the type of skin packaging described, this has been accomplished to a certain extent, but only in connection with products having base portions of sufficient extent so that they themselves are free-standing independent of the packaging. Obviously, articles not having the requisite base portion could not provide free-standing skin packages.

Although this limited stand-up capability of the skin package offers this advantage over known blister packages, the blister package is superior in other respects. Firstly, since it is self-supporting, it can retain its shape independently of the article to be packaged and thus is more suitable for packaging groups of small parts, such as screws, nails, etc. Secondly, the blister type of package is easier to form, being readily adaptable to mass production on existing plastic forming machinery, and when assembled on a card, it does not require the intermediate step of securing the film over the window in the card as is required with said skin packaging. Thirdly, since the blister packages are preformed, and attachment to the display card is effected only along the peripheral flange, no heat is required to be directly

applied to the blister adjacent the article contained therein, as is the case in skin packaging.

In addition, the plastic memory characteristic of the films ordinarily used for skin packaging tends to shrink the film after formation of the package when the packages are subjected to heat, such as sunlight in a shop window, radiators, etc., stressing the skin to a point where it tears, or tends to separate the halves of the card within which it is secured. Since the preformed blisters are not so stressed during formation, plastic memory effects are not a factor. From an esthetic point of view, skin packaging techniques are inherently incapable of conforming the film precisely to the product being packaged, especially adjacent interior corners, while blister packages may be molded to the exact contours of many products.

SUMMARY OF THE INVENTION

The present invention overcomes the above discussed shortcomings of both skin and blister packaging and provides a free-standing package, having the structural, esthetic and economic advantages of the blister package yet at the same time, enabling products of a wide variety of shapes to be packaged in a manner permitting stand-up display, without reliance on the inherent stand-up capability of the product. These advantages are realized by preforming the blister enclosure from a unitary piece of plastic sheet material, of sufficient thickness to be self-supporting, in such a manner to provide an unbroken base portion which becomes a substantially flat surface when the package is completed. In accordance with the invention, this enclosure is obtained by forming it in two opposed mating sections integrally joined along a fold line which traverses the base portion. Flanges are formed along the free edges of each of the two sections to provide means for securing them together around the product to be packaged. When the package is completed, the two opposed sections are brought together about the product leaving the base in flat condition.

The package of the invention is formed by a novel technique in which a preheated segment of plastic sheet is positioned over a molding tool which consists of two segments angularly disposed with respect to each other and meeting in substantially a line contact. Each half of the molding tool corresponds in shape to one of the two sections of the finished package enclosure. By disposing the mold sections at an angle to each other and joining them along a line, mold surfaces are presented for creating the unbroken base portion of the package.

According to a preferred embodiment of the invention, the preheated plastic sheet is conformed to shape of the molding tool by creating a pressure differential, such as by creating a lower than atmospheric pressure below the mold, to force the softened sheet into close contact with the mold surfaces. After cooling, the formed sheet is removed and trimmed to provide the required flanges. Thus completed, the sections of the enclosure may be readily folded towards each other along the fold line traversing the base portion, which acts as a hinge. This facilitates automatic filling of the enclosure and the subsequent closing and sealing.

The present invention thereby provides a package having all of the positive attributes of blister packaging and yet provides the free-standing package which heretofore has been available only by applying skin packaging.

ing techniques to articles which were inherently self-standing. Thus, while with presently known free-standing packaging techniques, the product has supported the package and the display card, the present invention provides a package which itself is free standing and which can retain in an upright position a product which itself is not self-standing. As will be appreciated, this enables application of blister packaging to a wider variety of products than other techniques, including both rigid articles and bulk products, e.g., powders, liquids, or small parts, e.g., screws, nails, all of which can be displayed in a free standing, upright position.

Other objects, features and advantages of the invention will become apparent from the following detailed description thereof when taken in conjunction with the appended drawings, in which:

FIG. 1 is a perspective of a preformed enclosure according to the present invention;

FIG. 2 is a schematic representation of the manner in which a product to be packaged is inserted in the preformed enclosure of FIG. 1;

FIG. 3 is a side elevation of the enclosure completed according to FIG. 2;

FIGS. 4 and 5 are respectively front and side elevations of a modification of the enclosure of the invention wherein the upper flanges are extended to provide a display surface;

FIG. 6 is a perspective view of a preformed enclosure according to the invention in which the two sections are of different shape;

FIGS. 7 and 8 are respectively front and side elevations of a modification of the package of the present invention in which the basic enclosure is secured to a display card;

FIGS. 9 and 10 are respectively front and side elevations of a variation of the package of FIGS. 7 and 8 in which a double or folded card is employed;

FIGS. 11 and 12 are respectively front and side elevations of a modification of the basic enclosure of the invention in which the base portions are provided with lateral extensions to increase stability;

FIGS. 13 and 14 are respectively front and side elevations of modifications of the basic package showing applications of the invention to containment of products which are not of themselves capable of standing upright;

FIG. 15 is a partial section through a molding tool illustrating the method of the invention; and

FIGS. 16 and 17 represent respectively male and female molding tools capable of use in the method of the invention.

DETAILED DESCRIPTION

Turning now to FIG. 1, the basic package according to the present invention comprises an enclosure 20 preferably formed of a plastic sheet material of sufficient thickness to be relatively rigid and self-supporting, as contrasted with the films employed in skin packaging. Although by no means intended as limiting, ordinarily such materials would have a minimum thickness of from 5 to 6 mils, although it may be possible in some applications to use even thinner sheets. Suitable plastics may be selected, for example, from among the polystyrenes, acetates, butyrates, propionates and vinyls, as well as others. If desired for added

rigidity, the plastic sheet material may be ribbed or otherwise configured.

The enclosure 20 is formed from a unitary piece of plastic sheet material into sections 22, 24 which are integrally joined along a fold line 26 traversing the base portion 28. The sections 22 and 24 are formed with a shape most appropriate to the goods to be packaged therein and for purposes of example only, are shown as being cylindrical. It will be understood that an almost infinite number of shapes may be applied to the sections 22, 24, either closely conforming to the shape of the package product or completely independent thereof. Moreover, as will be discussed hereafter, it is quite practical to have the two sections differ in shape from one another if required by the particular packaging problem.

Each of the sections 22, 24 is provided with respective flanges 32, 38 extending continuously along the free edges of the respective section. As will be explained hereinafter, these flanges provide sealing surfaces by means of which the enclosure may be completed about the product to form the finished package. To facilitate flexing of the hinge line of the two sections, the flanges may be punched, cut, perforated, or slit in the vicinity of the ends of fold line 26, as indicated at 34. The upper ends of the cylindrical enclosure sections illustrated are designated by the numerals 40, 42, respectively.

FIGS. 2 and 3 illustrate the manner in which the enclosure is assembled to form the finished package. The article to be packaged, designated by the numeral 44, is first inserted in one of the sections, such as 24, which normally would be retained in a jig having an opening for supporting the enclosure. Once inserted, the other section 22 is closed upon the section 24 by rotating it about the fold line 26 in the base portion 28 as indicated by the arrow. Closure of the two sections brings respective flanges 32 and 38 into contact with each other over the entire periphery of the enclosure. To finish the package, the flanges are secured to each other such as by adhesives or heat sealing. This completely seals the product since the base portion 28 is unbroken. As shown in FIG. 3, the completed enclosure is capable of free-standing in the upright position on its now substantially flat base portion 28.

In packaging of the type described herein, it is often desirable to incorporate in the package an advertising or display message calculated both to catch the eye of and inform the consumer. In accordance with one aspect of the present invention, this may be simply accomplished by merely extending the respective flanges 32 and 38 outwardly of the article-enclosing portions thereof.

In FIGS. 4 and 5, the upper ends of the flanges are extended as indicated at 33 and 39, respectively, to provide the display surfaces. Suitable printing or art work may be applied directly to the plastic surfaces or alternatively, a printed card or paper sheet may be inserted between the flanges before sealing to provide the required information. Although the package of FIGS. 4 and 5 is free-standing on its base portion 28, a hole 41 may be provided in the flange extensions to enable hanging of the package when circumstances require.

FIG. 6 illustrates a modification of the invention in which the section 24 of the enclosure differs in shape from the section 22; in this case being a flat surface. In the illustrated example, this provides a semi-cylindrical

finished package when completed, with the fold line 26 traversing the base portion along the straight edge thereof. As indicated hereinabove, the invention is susceptible of application to a virtually infinite number of shapes of articles to be contained and the shapes of the sections 22 and 24 may be varied accordingly. It is required only that suitable flanges be provided along the free edges of each of the two sections which will contact each other when the two sections are folded to complete the package. In the case of the example of FIG. 6, the flange on the section 24 is formed by the peripheral portion of the planar section 24.

If it is desired to secure the basic enclosure of the present invention to a display card, this may be readily accomplished in several ways. Referring to FIGS. 7 and 8, the completed enclosure 20 is secured on one side of a single thickness card 50 by cementing or heat sealing it to the card along its flanges 32, 38. As in the embodiment of FIG. 4, a hole 51 for hanging the completed package may be provided.

In the embodiment of FIGS. 9 and 10, a double thickness card 52 is employed to enable concealment of the flanges between the layers which may be formed either by two individual card sections or a single folded card. This provides a somewhat more pleasing appearance, since the flanges are hidden from view. Again a hole 53 may be provided in the card to enable hanging of the completed package. In both embodiments employing display cards, the card edges extending in the plane of the base 28 serve to enhance stability of the package.

To increase the intrinsic stability of the basic enclosure itself, the base portion may be formed with lateral extensions as shown at 28a in FIGS. 11 and 12. As will be appreciated, these extensions effectively increase the base area to provide greater support for the package. The extensions may be of any appropriate shape to suit particular applications and, if adequate for a given package requirement, a single extension may be formed on one side only of the base.

As indicated hereinabove, a particular advantage of the free-standing capability of the present package is that it can support, in upright position, articles which inherently are not capable of standing upright. This capability is illustrated in FIGS. 13 and 14 wherein the enclosure is shown adapted to support a product such as a tube of toothpaste. Such articles normally have a relatively sharp edge at their lower ends which are obviously incapable of supporting the tube in an upright position. When, however, it is supported in the basic enclosure of the present invention, the enclosure itself, being free-standing, serves to maintain the tube in an upright position, thus enabling it to be displayed on a countertop or shelf surface. Where necessary, to increase the rigidity of the enclosure or to retain an article securely positioned within the enclosure, ribs may be formed interiorly of the enclosure sections, as indicated at 62 in FIGS. 13 and 14. Such ribs would be of particular advantage where the article to be packaged is relatively heavy.

The foregoing represents but a few of the many variations of packages that may be provided in accordance with the present invention. In many cases, the blisters may be formed to closely conform to the shape of the article to be contained therein and may be of a clear plastic to permit direct viewing of the product. However, in some applications, such as in the packaging of bulk materials, it may be desirable to prevent direct

viewing of the contents. In such cases, an opaque plastic may be used, and if desired, printing or other graphics may be applied directly to the plastic of the enclosure, eliminating the need for a display card. Moreover, it may be generally desirable, in the packaging of single, rigid articles, to dimension the enclosure such that it firmly holds the article against twisting or movement. This would insure, for example, that a label on the article is always properly presented to view where the package enclosure is transparent.

As will be understood by those skilled in the art, the manufacture of the basic enclosure described above presents a difficult problem to the plastic packaging fabricator. Specifically, the base portion 28 must be formed so that it is substantially flat in the completed package and it must be of sufficient strength and rigidity to contain the article to be packaged without rupture. A method for forming such a package enclosure according to the present invention is illustrated schematically in FIG. 15.

A supply of suitable thermoplastic sheet material is heated and the softened sheet is then fed to a position adjacent the molding tool 76.

The molding tool comprises a pair of segments 78, 79 which, in the case of a male tool, are reversed in shape from the sections 22, 24 of the enclosure to be formed. These segments are axially aligned with respect to one another but angularly disposed in the plane perpendicular to the plane of the sheet material adjacent it. As indicated, the two segments meet each other substantially in a line contact 80.

To conform the plastic sheet material to the shape of the molding tool, a pressure differential across the plastic sheet is created, such as by establishing a partial vacuum beneath the mold elements. This may be accomplished by providing distributed holes 82 in the molding tool along the edges of the mold elements 78, 79 as well as along the line 80, and coupling the lower ends of the holes to a vacuum source. In the illustrated tool 76, the mold elements are mounted on the surface of a hollow chamber which is coupled by conduit 84 to a suitable vacuum pump. When the sheet material is properly positioned adjacent the molding tool, the vacuum pump is energized to draw the softened material onto the mold elements and to conform it with the shape thereof.

Once allowed to cool, the plastic sheet will set in the shape provided by the molding tool and then may be removed and trimmed, if necessary, to provide the desired flanges. By providing means to draw the web in towards the line 80 of the mold elements, a fold line is formed in the plastic sheet material across what becomes the base 28 of the package, without creating a flange or parting line which would interrupt its flatness. It has been found, moreover, that the described technique does not unduly stress or thin out the sheet material in the vicinity of the base and the resulting package retains its structural rigidity. Once trimmed, the preformed enclosures may be nested and stacked in preparation for the filling and closure operation.

The shapes of the mold elements 78 and 79, to create a cylindrical enclosure, are illustrated more clearly in FIG. 16. FIG. 17 illustrates a female version of the mold elements, showing the disposition of the vacuum holes 82 for drawing the plastic sheet into conformity with the two mold elements. Similar holes are provided in the male mold of FIG. 16.

Although described only schematically, it will be understood that the process is readily adaptable to mass production in accordance with modern automatic techniques available to the packaging industry.

Moreover, it will be apparent that many modifications and variations within the spirit of the present invention will occur to those skilled in the art and the scope of the invention is to be limited only by the appended claims.

I claim:

1. A free-standing package for containing goods comprising an enclosure having a substantially flat base portion and upstanding wall portions for enveloping said goods, said enclosure being preformed from a unitary segment of self-supporting plastic sheet material in two opposed mating sections integrally joined along a fold line traversing said base portion, each of said sections comprising a part of said wall portions and having outwardly extending flanges formed along free edges thereof, said enclosure being preformed with said sections opened outwardly of each other along said fold line and adapted to be closed about the goods by bringing the sections into contact with each other along their respective flanges and sealing them therealong, said base portion, including the fold line, becoming substantially flat and devoid of projections extending exteriorly of the plane of said base portion when said sections are closed, said enclosure being capable of supporting the finished package upright with said base portion resting on a flat surface.

2. The package of claim 1 wherein said flanges extend continuously along all of the free edges of each section and are cut adjacent the ends of said fold line to facilitate closing of said sections.

3. The package of claim 1 wherein at least one pair of mating flange portions is laterally extended to pro-

vide means for displaying visual information.

4. The package of claim 1 wherein said flanges are adapted to be continuously sealed together when said sections are closed about the goods to complete the enclosure.

5. The package of claim 1 wherein said base portion is preformed with at least one lateral extension in the plane of the base, thereby increasing stability of the package when standing in its upright position.

6. The package of claim 1 wherein the goods to be received by said enclosure consists of a single article having a predetermined shape and wherein said sections are preformed with said shape to closely envelope the outer surfaces of said article with said flanges meeting in a plane substantially perpendicular to said base and intersecting said article longitudinally thereof.

7. The package of claim 1 wherein said enclosure is formed from transparent plastic sheet material.

8. The package of claim 1 wherein said plastic sheet material is formed with ribs to increase its rigidity.

9. The package of claim 1 further comprising a display card having a cutout extending through to an edge thereof and shaped to receive the completed enclosure with said flanges overlaying the card along the periphery of said opening and said base portion lying along said edge, said card being secured to said enclosure along said flanges.

10. The package of claim 9 wherein said card is formed of a single sheet of material and said flanges are secured to said card on one side thereof.

11. The package of claim 9 wherein said card is formed of a sheet of material folded upon itself to provide two layers and said flanges are secured to said card between said layers.

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