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C. E. PALMER

3,249,286

REINFORCED PLASTIC BAG

Filed Sept. 28, 1964

FIG. 1

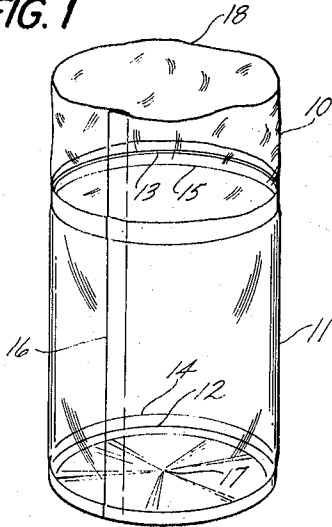


FIG. 3

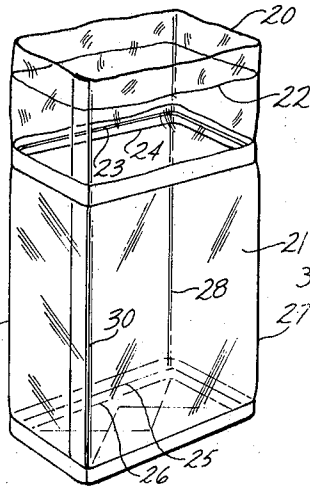


FIG. 7

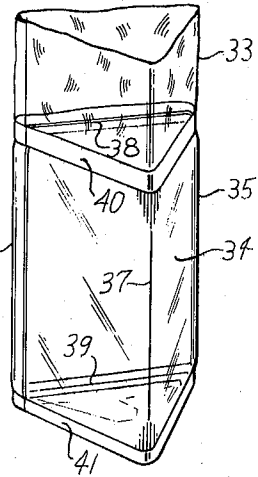


FIG. 2

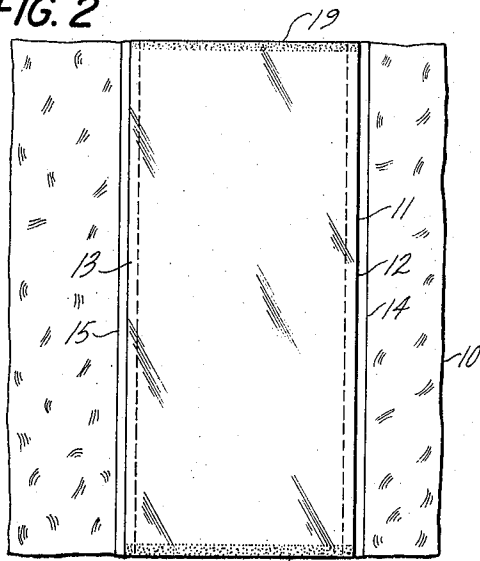


FIG. 4

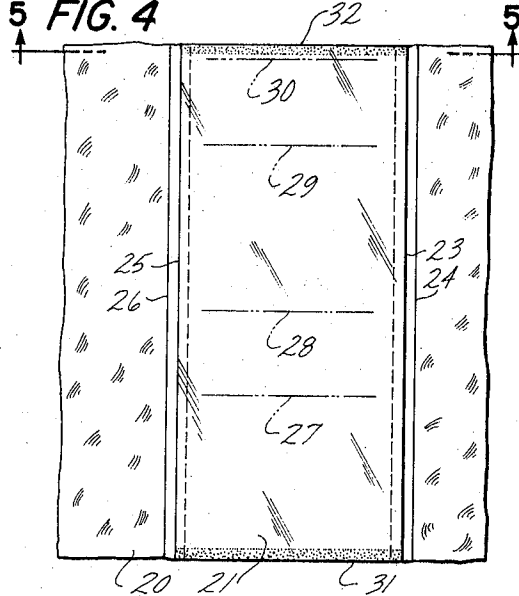
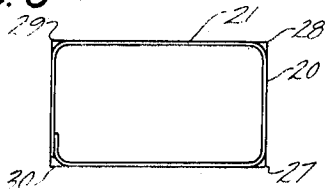


FIG. 5



FIG. 6



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3,249,286

REINFORCED PLASTIC BAG

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 8 Claims. (Cl. 229-55)

This invention relates to improvements in plastic bags and methods of fabricating such containers and, more particularly, a reinforced plastic bag providing highly desirable qualities.

An important object of the present invention is to provide a plastic bag which uniquely embodies and combines the most desirable qualities of semi-rigid plastic and flexible plastic film.

Another object of the present invention is to provide a plastic bag which has sufficient rigidity to stand up on a shelf for display purposes and to resist damage from normal impact or shock in handling and distribution.

Yet another object of the present invention is to provide an all-plastic bag which affords excellent visual display of the product within, yet is sufficiently rigid that a number of such containers may be stacked for display or for shipping purposes, without damage to the goods contained within the bag.

Another most important object of the present invention is to prevent the semi-rigid element of a container from cutting through or damaging the plastic film in which it is enclosed.

These and other features and objects of the present invention will be more readily understood from a reading of the description of several embodiments of the present invention which follows, taken together with the drawings in which:

FIGURE 1 is a perspective view of one embodiment of the present invention;

FIGURE 2 is a top elevational view of a blank used to form the container illustrated in FIGURE 1;

FIGURE 3 is a perspective view of an embodiment of the present invention including an inner container of flexible plastic film;

FIGURE 4 is a top elevational view of a blank used for forming the container shown in FIGURE 3;

FIGURE 5 is a cross-sectional view of the blank of FIGURE 4 taken through section 5-5;

FIGURE 6 is a cross-sectional view of the blank of FIGURE 4 in its permanently folded and erected state; and

FIGURE 7 is a perspective view of yet another embodiment of the present invention.

The all plastic bag or container of the present invention basically comprises an inner liner which is of semi-rigid synthetic plastic sheet material and an outer container of flexible synthetic plastic film enclosing the inner liner and having portions which extend beyond the top and bottom of the inner liner, which are adapted to be folded to form the bottom and the top closures of the bag. The outer container of flexible synthetic plastic film has reinforcing strips affixed to its inner side so as to overlap the top and bottom free edges of the inner liner which defines the sidewalls of the container. The inner liner is of semi-rigid synthetic plastic sheet material and is secured to the flexible film along common edges lying between the top and bottom reinforcing strips and the edges of the resulting assembly are bonded in a common overlapping closure leaving top and bottom extending portions of the flexible film. As mentioned previously, the bottom portion of the flexible synthetic plastic film extending beyond the edges of the semi-rigid inner liner is approximately folded into a closure and bonded, and after the bag has been filled with the

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product to be contained therein, the top portion of the flexible synthetic plastic film is similarly folded and secured to complete the final closure of the bag.

In the method of fabricating the reinforced plastic bag of the present invention, the spaced reinforcing strips are affixed to a substantially rectangular sheet of flexible synthetic plastic film, the reinforcing strips being positioned parallel to and inwardly from opposing edges of the sheet. Then a substantially rectangular sheet of semi-rigid plastic sheet material is placed in overlying relationship upon the sheet of flexible film with two of its edges overlapping the reinforcing strips and its remaining two edges coincident with portions of two edges of the flexible film. The two sheets of plastic are then secured along the latter coincident edges lying between the spaced, parallel reinforcing strips. This composite is then further assembled by bonding the previously secured edges of the two sheets in overlapping relationship and securing the top and bottom extending portions of the flexible film to provide top and bottom enclosures for the container.

The reinforced plastic bag of the present invention may take the form of a number of different embodiments, including a substantially tubular container as is described above, or a container of substantially polygonal cross-section which may include sidewalls of substantially rectangular shape as defined by the semi-rigid synthetic plastic sheet material which forms the inner lining of the bag. In fabricating the latter embodiment of the present invention, the assembly of the inner liner and outer sheet undergo the further step of being folded substantially in accordance with the method and means described in my Patent No. 2,954,725, issued October 4, 1960, for "Method and Apparatus for Folding Sheet Stock."

In accordance with the concept of the present invention, the further step of folding the blank comprised of the assembled elements as described hereinbefore, includes supporting the assembly between a die pad underlying a plurality of parallel lines which are normal to the free edges of the semi-rigid liner sheet, but terminate short of the free edges. The spaced parallel lines are then folded with folding blades as described in my previously noted patent to establish permanent folds in the semi-rigid material so that the bag takes the shape of substantially rectangular sidewalls but the free edges defining rounded corners due to the fact that the folds in the semi-rigid sheet liner terminate short of the free edges of the semi-rigid material. This rounded corner configuration affords a particular advantage and desirable feature of the present invention as will be explained more fully hereinafter.

Referring now to FIGURE 1, there is shown an embodiment of the present invention having an outer container 10 of flexible synthetic plastic film enveloping an inner liner 11 of semi-rigid plastic sheet material which extends from its bottom edge 12 to its upper edge 13. Reinforcing strips 14 and 15 are affixed to the inner surface of the outer container 10 of flexible synthetic plastic film and are positioned to overlap the respective bottom and top free edges 12 and 13 of the inner liner 11 of semi-rigid plastic material. The outer container 10 is secured to the inner sleeve 11 of semi-rigid material along the marginal edges 16 between the top and bottom edges 13 and 12 of the semi-rigid inner liner. The entire assembly is further secured in an overlapping closure along the entire length 16 of the edges of the composite structure, including the edges of the flexible synthetic plastic film extending at the bottom and the top beyond the liner 11 of semi-rigid material. The portion of the flexible synthetic plastic film extending beyond the bottom of the semi-rigid liner 11 is appropriately folded and secured as shown generally at 17 to form the bottom of the con-

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tainer and the portion 18 of the same plastic film extending beyond the top of the semi-rigid liner 11 affords a means of making a final closure of the package after it has been filled with the product to be contained therein. The bag illustrated in FIGURE 1 is formed from a blank such as is illustrated in FIGURE 2 wherein like elements bear the same numerical designations as in FIGURE 1. A sheet of flexible synthetic plastic sheet material 10 of substantially rectangular shape has affixed to it two spaced, parallel reinforcing strips 14 and 15 which are positioned inwardly from one pair of opposed edges of the sheet 10 and extend from one of the other edges to the remaining opposed and parallel edge. A smaller sheet of semi-rigid plastic sheet material 11 of substantially rectangular form and having a length equal to that of the reinforcing strips 14 and 15 is positioned over the film sheet 10 with parallel free edges 12 and 13 partially overlapping the reinforcing strips 14 and 15, and the semi-rigid sheet 11 is secured to the film sheet 10 along the overlying coincident edges 19 lying between the parallel reinforcing strips 14 and 15. The blank assembly is further formed by closing the secured overlapping edges 19 upon themselves and bonding those edges in closure, including the edges of the film sheet 10 extending beyond the free edges of the semi-rigid liner 11.

FIGURE 3 illustrates another embodiment of the present invention, including an outer container of flexible synthetic plastic film 20 and inner sleeve 21 of semi-rigid plastic sheet material which defines substantially rectangular sidewalls of the bag, and an inner container 22 of flexible synthetic sheet material which may be added to the basic assembly as desired for the purpose of preventing a granular or powder-like product from tending to work between the outer film container 20 and the inner sleeve 21. As is the case of the embodiment illustrated in FIGURE 1, the inner sleeve 21 extends to its free edges at the top 23 which partially overlap the upper reinforcing strip 24 affixed to the inner side of the film outer container 20 and similarly its bottom edges 25 partially overlap the lower reinforcing strip 26. The inner sleeve 21 of semi-rigid plastic material is permanently folded along spaced parallel lines 27, 28, 29 and 30 to form the corners of the bag and define its sidewalls.

The particular manner in which the folds along lines 27, 28, 29 and 30 are made in the semi-rigid sheet 21 can perhaps be best seen in FIGURE 4 wherein like elements bear the same numerical designations as in FIGURE 3. In the top elevational view of FIGURE 4 there is shown a substantially rectangular sheet 20 of flexible synthetic plastic film such as cellulose acetate, polyethylene, rubber hydro-chloride, polyvinylidene chloride, or polyvinyl-chloride-acetate copolymer, for example. Spaced parallel reinforcing strips 24 and 26 are positioned inwardly from opposed edges of the flexible sheet 20, which strip areas may be reinforced by adhesively secured tape, a deposited additional plastic coating, or a layer of heat sealed plastic, for instance. A semi-rigid sheet 21 of synthetic plastic material overlies the flexible sheet material 20, two of its edges 23 and 25 partially overlapping the reinforced strip areas 24 and 26, respectively, and the margins of its two remaining edges 31 and 32 being bonded to the flexible sheet 20 along its coincident underlying edges. The semi-rigid sheet 21 may be any one of a number of suitable materials such as biaxially oriented polystyrene, polyethylene, polypropylene, cellulose acetate, cellulose acetate-butyrate or polyvinyl chloride-acetate copolymer.

As most clearly seen from FIGURE 5, a typical composite blank as conceived by the present invention appears in cross-sectional view as a number of overlying elements. Exaggerated somewhat in relative proportions and actual dimensions for emphasis and clarity of illustration, FIGURE 5 shows the large underlying thin sheet of plastic film 20 with reinforcing strip areas 24 and 26 overlying and affixed to the plastic film 20 inwardly from two of

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its opposed edges; the semi-rigid sheet 21 of synthetic plastic material in turn overlies both the larger sheet of plastic film 20 and the reinforced strip areas 24 and 26, overlapping the latter only partially so that the free edges 23 and 25 are positioned preferably near the middle of the reinforced strips 24 and 26, respectively.

The folds 27, 28, 29 and 30 are made in the composite blank of FIGURE 4 by the method and means described in my Patent No. 2,954,725 and as can be seen most clearly in FIGURE 4 the folds along lines 27, 28, 29 and 30 terminate inwardly of the edges 23 and 25 of the semi-rigid sheet 21. Thus, when the composite blank is erected by securing the overlapping edges 31 and 32 to each other, the bag takes a substantially polygonal cross-sectional form along the permanent folds and the top and bottom portions adjacent the free edges 23 and 25 of the semi-rigid sheet 21 assume a round-cornered polygonal cross-sectional configuration as is best shown in the cross-sectional view of FIGURE 6. The permanent folds 27, 28, 29 and 30 in the inner liner 21 define the sidewalls of the container, but because the folds terminate inwardly of the free edges 23 and 25 of the inner liner 21 there are no acutely angled corners, but rather the round cornered configuration shown in FIGURE 6. The advantage of this feature of the present invention is that the free edges of the semi-rigid inner sheet do not tend to tear or cut through the outer container of thin film. Additionally, the reinforced portions of the thin film outer container are permitted some movement with relation to the free edges of the inner sleeve preventing continuous wear in one place due to handling the container, filling it with the product which it is to contain, shipping it, placing it on shelves for display, and the like. Thus, the present invention combines the most desirable features of a transparent plastic film bag with the advantageous aspects of a transparent semi-rigid container of considerably heavier material.

The same features and advantages may be incorporated in many different shapes and configurations of the present invention, including, for instance, side walls which are tapered in a generally polygonal form and which preferably, though not necessarily, have two substantially parallel sets of edges at top and bottom of the sidewalls defining the basic shape of the container. FIGURE 7 illustrates a variant embodiment of the concept of the present invention in the form of a reinforced bag having a substantially triangular cross-section. An outer container 33 comprised of a sheet of flexible synthetic plastic film encloses a smaller sheet of semi-rigid synthetic plastic material 34 having three folds 35, 36 and 37 which terminate inwardly of its free edges at top and bottom 38 and 39, respectively, thus imparting a rounded corner configuration at the end sections of the semi-rigid inner liner 34. The outer container 33 of flexible synthetic plastic film has two reinforcing strips 40 and 41 affixed to its inner surface and partially overlapping the top and bottom free edges 38 and 39, respectively, of the semi-rigid inner liner 34.

In appearance the bag of the present container gives the visual impression of being fabricated of a single sheet inasmuch as the film sheet conforms closely to the configuration of the inner semi-rigid liner. Additionally, the liner imparts a degree of rigidity which resists rupture or damage to the bag from normal impact or shock. As will be appreciated by those skilled in the art, the present invention may take many different forms and configurations as may be desired to contain and display particular types of goods including generally rectangular but tapered side walls having top edges of its semi-rigid liner disposed in generally parallel relationship to the bottom edges of the liner.

Another advantage of the present invention is that the blank material comprising a continuous length of transparent synthetic plastic film material having reinforced strips may be combined with a continuous length of semi-

rigid material in a single roll to form a multiplicity of blanks for fabricating the present invention as taught and described herein. Such a roll of blank material affords the convenience of being preassembled by a plastic material manufacturer and shipped to the user of the container where it may be cut into appropriate lengths in accordance with the size of the containers which are desired, permanently cold-folded as is taught by the concept of the present invention, assembled and erected, filled with the product to be contained therein and final closure made for shipment. Thus the concept of the present invention permits blank material to be shipped from a manufacturer in most convenient and economical form at a minimum shipping cost. Moreover such rolls of blank material may be easily and conveniently retained in inventory by the bag user because of its minimal space requirements in the roll form of blanks which is made possible within the concept and teaching of the present invention.

As well as being a practical and efficient container which, because of its rigidity, is capable of standing up by itself for display and stocking purposes, the present invention, when embodied in transparent plastic materials, affords a most attractive, clear and virtually undistorted display of the goods or products contained therein. These features are due to the fact that the container of the present invention gives the appearance of a unitary, rigid, plastic material throughout these portions of the container through which the goods are usually viewed, i.e. the erect sidewalls of the container. The plastic film outer container of the bag of the present invention closely conforms to the flat, smooth configuration of the inner liner producing a minimum wrinkled or distortion effect in the display of the goods. The reinforcement strips which are affixed to the inner side of the outer container in partially overlapping relation to the free edges of the semi-rigid inner sleeve, may be colored or carry a brand name thereon to attractively define the top and bottom of the container in its erected form. The portion of the outer container of flexible film which extends beyond the top of the semi-rigid inner liner provides a convenient means of attaching an appropriate label for brand identification, price, content or other information relating to the goods which the bag contains. Such identifying label may of course, as will be evident to those skilled in the art, perform the equally important function of providing final closure of the bag after the goods have been placed therein.

Since many changes could be made in the above construction and many apparent widely different embodiments of the invention could be made without departing from the scope or spirit thereof, it is intended that all matter contained in the above description or the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described the invention, I claim:

1. A reinforced plastic bag comprising a tubular inner liner of semi-rigid synthetic plastic sheet material, said inner liner defining the sidewalls of said bag and having an open top and an open bottom, an outer container of flexible synthetic plastic film enclosing said inner liner and having portions extending beyond the top and bottom of said inner liner adapted to be folded to form top and bottom closures of said bag, and vertically spaced reinforcing strips of flexible material affixed to the inside of said outer container and extending about the top and bottom edges of said inner liner in partial overlapping relationship to said top and bottom edges, said inner liner and outer container being secured to each other along both side edges lying between the top and bottom reinforcing strips and said side edges overlapping each other and being bonded to each other in a common overlapping closure from top to bottom of said flexible film.

2. A reinforced plastic bag comprising a tubular inner liner of semi-rigid synthetic plastic sheet material having

a curvilinear cross section, and outer container of flexible synthetic plastic film enclosing said tubular inner liner and having portions extending beyond the top and bottom of said inner liner adapted to be folded to form top and bottom closures of said bag, and vertically spaced reinforcing strips of flexible material affixed to the inside of said outer container and extending about the top and bottom edges of said inner liner in partial overlapping relationship to said top and bottom edges, said inner liner and outer container being affixed to each other along both side edges lying between the top and bottom reinforcing strips and said side edges overlapping each other and being bonded to each other in a common overlapping closure from top to bottom of said flexible film.

3. A reinforced plastic bag comprising a tubular inner liner of semi-rigid plastic sheet material, said inner liner having a plurality of panels defining the side walls of said bag and having an open top disposed in generally parallel relationship to an open bottom, an outer container of flexible synthetic plastic film enclosing said inner liner and having portions beyond the top and bottom of said liner adapted to be folded to form top and bottom closures of said bag, and vertically spaced reinforcing strips of flexible material affixed to the inside of said outer container and extending about the top and bottom edges of said inner liner in partial overlapping relationship to said top and bottom edges, said inner liner and outer container being affixed to each other along both side edges lying between the top and bottom reinforcing strips and said side edges overlapping each other and being bonded to each other in a common overlapping closure from top to bottom of said flexible film.

4. A reinforced plastic bag comprising a tubular inner liner of semi-rigid synthetic plastic sheet material, said inner liner having a plurality of substantially rectangular panels defining the side walls of said bag and having an open top and an open bottom, an outer container of flexible synthetic plastic film enclosing said inner liner and having portions extending beyond the top and bottom of said inner liner adapted to be folded to form top and bottom closures of said bag, and vertically spaced reinforcing strips of flexible material affixed to the inside of said outer container and extending about the top and bottom edges of said inner liner in partial overlapping relationship to said top and bottom edges, said inner liner and outer container being affixed to each other along both side edges lying between the top and bottom reinforcing strips and said side edges overlapping each other and being bonded to each other in a common overlapping closure from top to bottom of said flexible film.

5. A reinforced plastic bag comprising a tubular inner liner of semi-rigid synthetic plastic sheet material, said inner liner having a plurality of rectangular panels defining three side walls of said bag and having an open top and an open bottom, an outer container of flexible synthetic plastic film enclosing said inner liner and having portions extending beyond the top and the bottom of said bag adapted to be folded to form top and bottom closures of said bag, and vertically spaced reinforcing strips of flexible material affixed to the inside of said outer container and extending about the top and bottom edges of said inner liner in partial overlapping relationship to said top and bottom edges, said inner liner and outer container being affixed to each other along both side edges lying between the top and bottom reinforcing strips and said side edges overlapping each other and being bonded to each other in a common overlapping closure from top to bottom of said flexible film.

6. A reinforced plastic bag comprising a tubular inner liner of semi-rigid synthetic plastic sheet material, said inner liner having a plurality of rectangular panels defining two pairs of substantially identical sidewalls and having an open top and an open bottom, an outer container of flexible synthetic plastic film enclosing said in-

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ner liner and having portions extending beyond the top and bottom of said inner liner adapted to be folded to form a top and bottom of said bag, and vertically spaced reinforcing strips affixed to the inside of said outer container and extending about the top and bottom edges of said inner liner in partial overlapping relationship to said top and bottom edges, said inner liner and outer container being affixed to each other along both side edges lying between the top and bottom reinforcing strips and said side edges overlapping each other and being bonded to each other in a common overlapping closure from top to bottom of said flexible film.

7. The reinforced plastic bag of claim 3 wherein said plurality of rectangular panels define two pairs of opposing sidewalls and the opposing sidewalls of each said pair of substantially identical dimensions.

8. A blank for a reinforced plastic bag comprising a substantially rectangular planar sheet of semi-rigid plastic sheet material, a substantially rectangular sheet of flexible synthetic plastic film of the same width as said sheet to provide side edges in general alignment and of greater length than said sheet to provide portions extending beyond the other edges of said sheet, said sheets being bonded to each other along the generally aligned side margins, and spaced reinforcing strips of flexible material affixed to said film sheet and extending along the other side edges of said semi-rigid sheet in partial overlapping relationship to said other edges of said semi-rigid sheet.

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