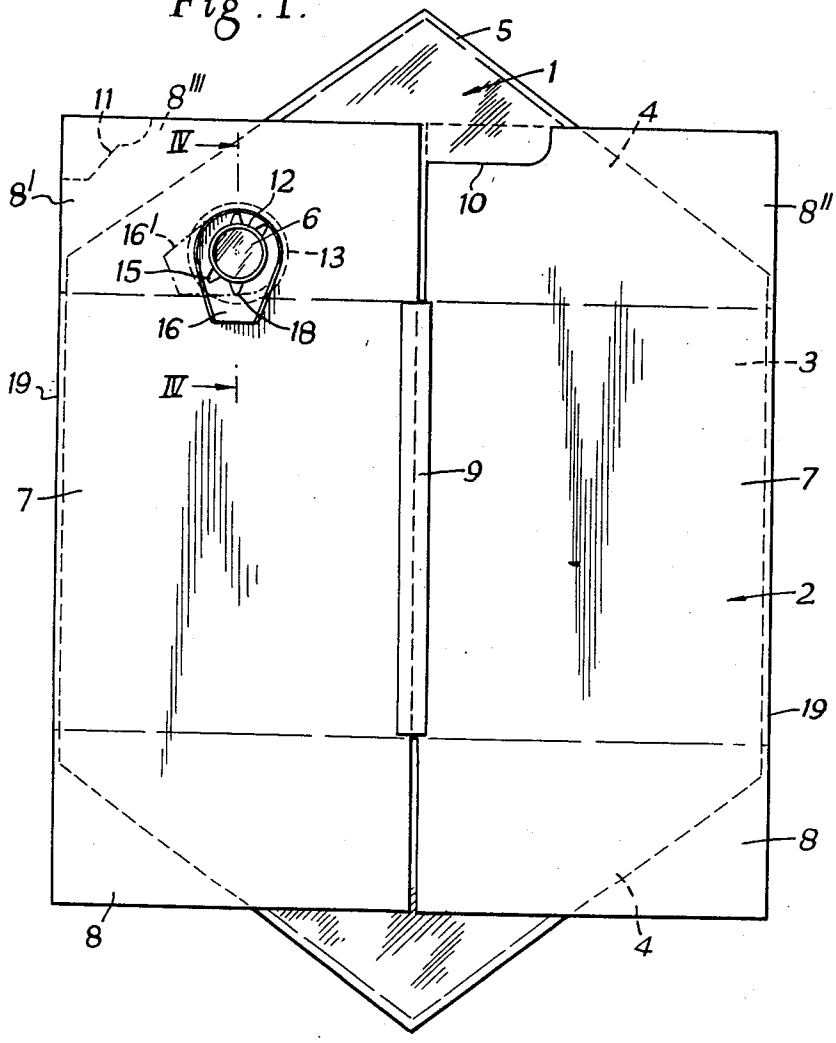
May 12, 1964 G. V. FORREST 3,132,789

PACKAGING CONTAINERS

Filed Oct. 22, 1962 4 Sheets-Sheet 1

Fig. 1.

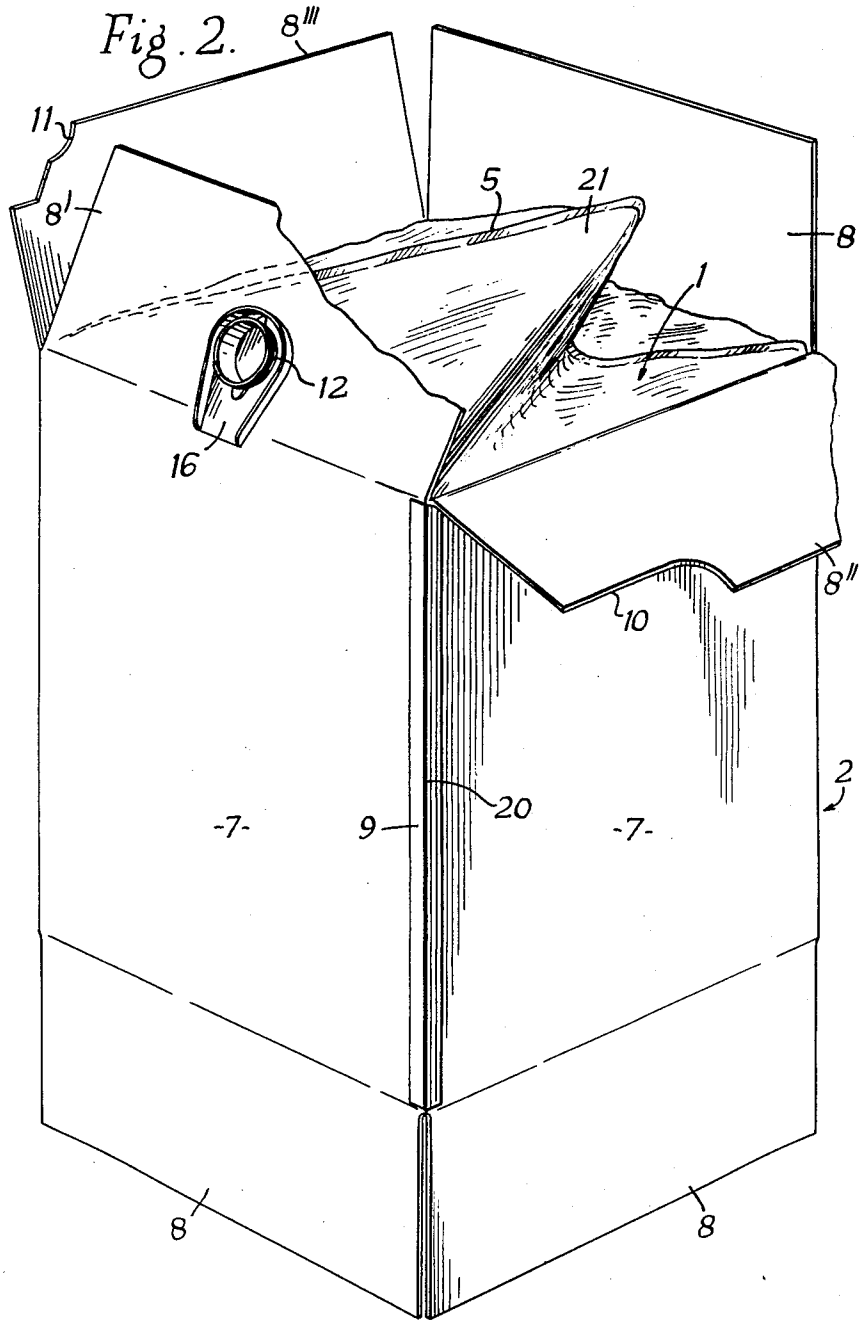


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PACKAGING CONTAINERS

Filed Oct. 22, 1962 4 Sheets-Sheet 2

Fig. 2.



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PACKAGING CONTAINERS

Filed Oct. 22, 1962 4 Sheets-Sheet 3

Fig. 3.

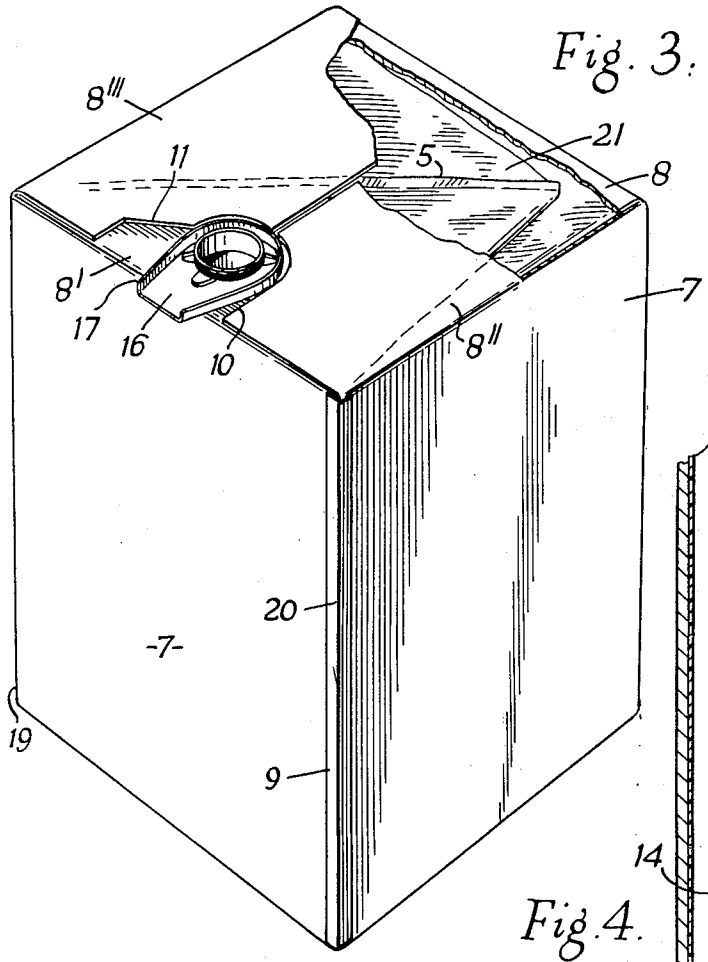
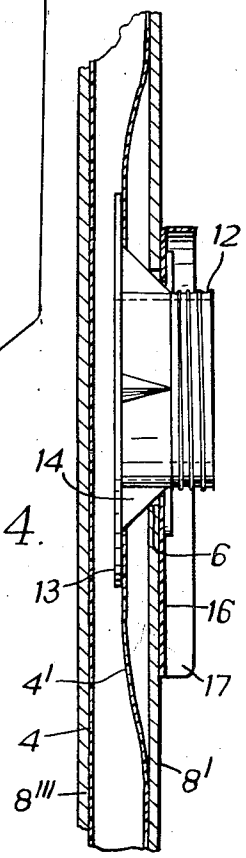


Fig. 4.



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PACKAGING CONTAINERS

Filed Oct. 22, 1962 4 Sheets-Sheet 4

Fig. 5.

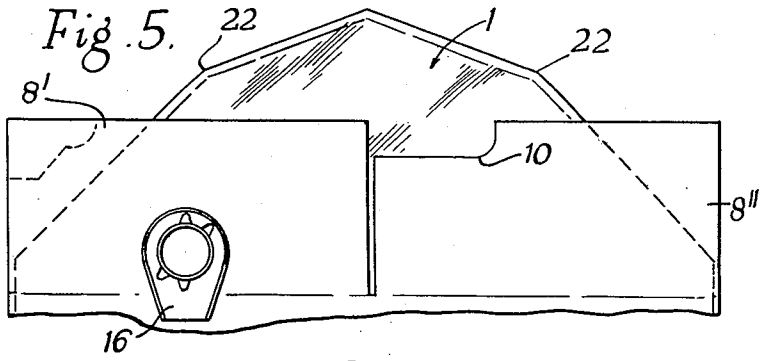


Fig. 6.

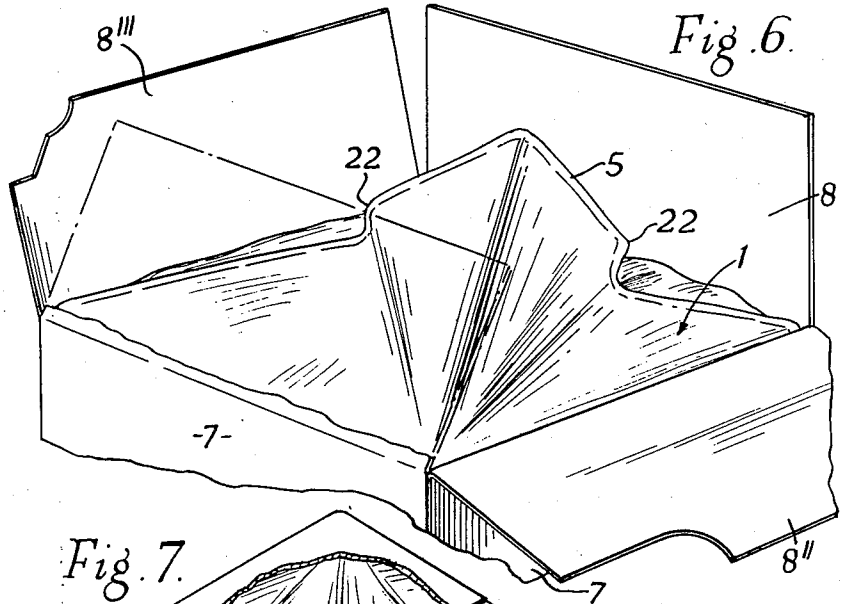
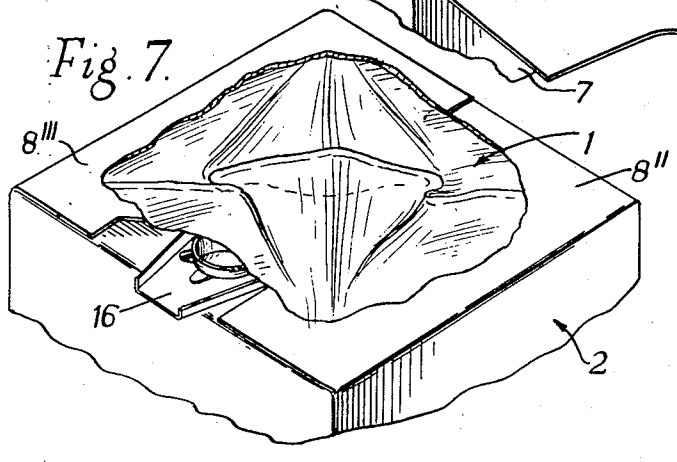


Fig. 7.



United States Patent Office 3,132,789 Patented May 12, 1964

3,132,789

PACKAGING CONTAINERS

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5 Claims. (Cl. 229—14)

This invention relates to containers for the storage and transport of liquids and other loose fluent commodities. More particularly it is concerned with containers of this kind which comprise an inner closed receptacle consisting of a bag, envelope or equivalent of flexible sheet material, and an outer carton of more rigid material forming a protective enclosure for the inner receptacle.

In this kind of container the inner receptacle is, in effect, a self-sufficient container for the liquid or other contents and can be filled and emptied similarly to more rigid types. The outer carton, which primarily has the function of protecting the inner receptacle against mechanical damage, can be of relatively cheap cardboard or like material. Normally the inner receptacle in this kind of container is made separately from, and then disposed within, the outer carton.

The subject of this invention is a form of packaging container which can fulfill the functions of the above kind but which has a number of attributes, viz. that it can be brought to the filling site in a ready-assembled, flat condition, occupying little space, that it can be erected into its usable stage by unskilled labour without requiring any assembly together of the inner receptacle and carton, that it can cater successfully for the storage and conveyance of many and varied types of product despite normal rough handling and stacking, and withal can be inexpensively produced so that it can economically be discarded after use to avoid the expense of "returns."

With these ends in view, the container devised in accordance with this invention comprises an inner receptacle consisting of a closed bag or envelope of a flexible sheet material with a filling and dispensing device, and a rigid or relatively rigid outer carton intimately enclosing said receptacle, the receptacle and carton being collapsible into a flat laminate and side walls of the carton and receptacle which stand face to face in the erected container being attached to one another so that erection of the carton automatically erects the receptacle.

It has been found that on this basis one is able to produce a package of the stated kind which can be erected in impeccable fashion, by a few simple actions on the part even of an unskilled user, and then affords a shape-retaining, and neatly-tailored container which can be readily handled for filling and emptying.

More specifically, in implementing the requirements of this invention the container will advantageously comprise a closed receptacle of flexible sheet material which can be collapsed flat into a double-thickness laminate, and a carton, co-extensive with, surrounding, and secured to the side walls of this receptacle, this carton being collapsible to form, with the collapsed receptacle, a flat, four-layer pack in which the side edges of the body of the carton are parallel and are in substantial register with those of the receptacle, whilst the ends of the layers of the closed ends of the receptacle are tapered outwards beyond the corresponding ends of the carton body.

These tapered ends, it will be appreciated, represent the effective top and bottom of the erected receptacle, and a particular shaping, conducive to simplicity of opening out and neat disposal of surplus sheet material, will be described later in this specification.

In a preferred form the container, in collapsed condition, comprises an inner receptacle made up of two superimposed, registering layers of flexible sheet material united

around their common periphery (defined by a pair of parallel opposite side edges and convex upper and lower edges), and an outer carton of which the main body enfolds the flattened receptacle from the exterior and which is made up of four rectangular, side-by-side panels defined by parallel fold lines, each adjacent pair of these four panels together being of substantially the same width as the adjacent part of a layer of the inner receptacle and being cemented to this part. As will be appreciated, this construction calls for a minimum of fabricating operation and equipment.

Thus, in the collapsed container the flexible inner receptacle is, in effect, sandwiched between two sides of the flattened carton, with the parallel side edges of the flattened receptacle fitting into, and alongside and parallel with, the corresponding folds of the carton. When the package is to be opened up, it is only required to press the folded side edges of the carton towards one another, when the intermediate folds of this carton will move apart in sympathy and, in so doing, draw the opposite sides of the inner receptacle layers apart by virtue of the attachment of the latter to the carton panels. The container will thus be automatically and positively erected by a single action.

During the initial pressing open of the package, the parts of the inner receptacle layers overlapping the upper and lower ends of the side edges of the latter will be folded over automatically and opened out to form top and bottom walls, i.e. the ceiling and floor, of this receptacle. Appropriate convex shaping of the upper and lower end edges can be devised so that the inner receptacle will make virtually the total volume of the final package available for accommodation of the material to be packaged. At the same time it can be devised so as positively to dictate the unfolding of the receptacle and eliminate unsightly, gathered receptacle material in the erected package, and all this without unnecessary cutting operations and waste, complication of sealing tools (see below) and so on.

In this regard an optimum arrangement which has been devised is a symmetrical tapering of the ends of the flattened receptacle to a central tip, e.g. into a V-shape. Thus, in a preferred form the inner receptacle, in its collapsed condition, consists of a double-thickness blank of sheet material comprising a rectangular main body portion with end parts of triangular shape. This V or triangular shape is found to provide an optimum unfolding, leaving only a small outstanding peak which bends over as the receptacle is opened out and, when it is fully opened, lies nearly flat on the remainder so as to present a neat and unobstructive disposal of the surplus material.

The invention also includes an inner receptacle comprising a closed bag which, in collapsed condition, is a two-layer envelope of flexible, heat sealable, sheet material closed around its edges and composed of a rectangular body section with convex, tapered end sections, and a nozzle or spout secured to one of these end sections away from its defining edges for incorporation in a container of the form defined above.

Forms of container constructed on the principles of the present invention are illustrated in the accompanying drawings, in which:

FIGURE 1 is a plan view of one form of container in its assembled but collapsed condition,

FIGURE 2 is a perspective illustration of the container of FIGURE 1, during erection,

FIGURE 3 is similarly a perspective illustration of the container erected and ready for dispensing,

FIGURE 4 is an enlarged cross section on the line IV—IV of FIGURE 1, and

FIGURES 5 to 7 correspond respectively to FIGURES

1 to 3 and show the upper part of a modified form of packaging container in the three stages of erection.

Referring first to FIGURE 1, the collapsed structure there illustrated primarily comprises an inner receptacle which has been denoted 1 and an outer carton indicated by 2. The inner receptacle 1 basically comprises two registering blanks of Melinex sheeting each consisting of a rectangular body portion 3 and symmetrical triangular end parts 4. These two sheets are heat sealed together by a seam 5 which extends around the whole periphery of the two blanks. This leaves the inner receptacle completely closed except for a filling and dispensing opening (which will be referred to below).

The outer carton is of cardboard and completely enfolds the inner receptacle 1 from the exterior. It is cut and scored to form it into four like rectangular panels 7 each of approximately half the width of the body portion 3 of the inner receptacle, and of a length a little less than this body portion. The carton is formed from a single sheet of cardboard and, when enfolded around the inner receptacle, is closed at its abutting ends by a length of adhesive tape indicated at 9.

The panels 7 are secured by adhesive to the walls of the body portion 3 of the inner receptacle with which they are respectively in face-to-face contact. This adhesive must at least be provided at the corner area of each panel, though more extensive application is possible, for example over the whole contact area. In practice it is found most convenient and safest to apply the adhesive in strips around the four margins of each rectangular panel 7.

Attached to each end of each individual panel 7 but free of the inner receptacle is a flap 8 destined to close the ends of the erected container. One of the upper end flaps (8′) is provided with a circular opening 6 for receiving the nozzle of the inner receptacle (see below) and the adjacent flaps 8″ and 8‴ are respectively recessed at 10 and 11. The function of recesses 10 and 11 will become clear hereafter.

One layer 4′ of the upper end part 4 of the inner receptacle has a dispensing opening around which is secured the collar 13 of a tubular nozzle 12 injection moulded from polyethylene. This nozzle is externally threaded, and is strengthened by webs 14. The nozzle 12 is also formed with a pair of lugs 15 which project from diametrically opposite sides thereof and serve to retain the nozzle in engagement with the flap 8′ when it is pushed through the latter (see below). Thus when the container is assembled the nozzle 12 is pushed through the opening 6 in the adjacent end flap 8′ and the lugs 15, being of an appropriate polythylene, can yield and pass through, then recovering and preventing the nozzle being accidentally pulled back through the opening 6.

In addition the nozzle carries a pouring spout 16 which is made as a separate article, conveniently being moulded in polyethylene, and is in the form of a chute or open-ended trough with a marginal flange 17 around its periphery, except at its narrowest pouring end. It is provided with an aperture which enables it to be located with a snug fit around the root of the nozzle 12 but to be turned on the latter when required. It is also provided with a pair of diametrically opposed slots 18 of a size representing a passing fit with the lugs 15 so that, in assembly, the slots 18 can be positioned over these lugs and the spout 16 pressed home and then turned so that it is trapped.

With the parts assembled as so far described, and as indicated in FIGURE 1, the container is ready for use and, being collapsed practically flat and compactly, can be transported in substantial numbers in confined spaces. It can be very quickly erected into the form illustrated in FIGURE 3 for filling. All in fact that is required is that pressure shall be exerted by the hands of a user at the two lateral edges (viz. 19) of the collapsed container. As these edges are pushed towards one another, the two panels 7 flanking each of them swing apart to open the corresponding corners of the carton, whilst the other two corners open in sympathy, about the fold line 20. In consequence of this movement the inner receptacle 1 is also opened up, the side walls thereof exactly following the movement of the side panels of the outer carton.

At the same time, the triangular end parts 4 of receptacle 1 also open and fold to form a peak 21 (see FIGURE 2) and, in the case of the upper end of the inner receptacle, the engagement between the nozzle 12 and the flap 8′ forces this flap to swing downwards and inwards as the container is opened. This has the effect of biassing the peak 21 so that it folds downward in like direction, and the surplus material is neatly tucked in to form two superimposed layers on the top of the finally-erected receptacle (see FIGURE 3). In practice the final formation of the end is best accomplished by completing the folding down of the flap 8′ by hand and then subsequently turning over the end flaps 8, 8″ and 8‴.

It has been found in practice that the apex angle of the triangular end parts 4 can vary to some degree, depending, inter alia, on the dimensions of the erected container, whilst still achieving the folding over of peak 21 in the manner described. However, the angle and proportions indicated in FIGURE 1 of the drawings have proven very successful. Moreover, as also to be seen in FIGURE 1, the main body 3 of the blank is preferably made a little longer than the individual carton panels 7 so as to allow a slight excess of material which relieves strain on the corner connections during the opening-out operation.

The bottom end of the container can be similarly dealt with. In this case the peak 21 is biassed to one side or the other in response to a more powerful thrust by the right hand or left hand of the erecting party.

When erected as described above the jointing edges of the end flaps of the carton can be sealed and held together by strips of adhesive paper or equivalent, and the article is ready for use. After it has been filled through the nozzle 12, this can be closed by a screw-on cap (not shown), and the spout 16 pushed round, if need be, into a retracted position in the recess 11, i.e. that indicated at 16′ in FIGURE 1. This leaves the side walls of the package container free of projections, and it is to be noted that the nozzle 12 is of relatively low height so that even a cap thereon does not stand proud to any substantial degree above the flaps 8″, 8‴. It will be convenient, in applying an adhesive strip referred to above to the upper side of the carton to run this over the cap and down the adjacent side of the latter to ensure that the cap and the spout 16 are held in place when the filled container is to be transported any distance.

The blank of the inner receptacle 1 in the construction illustrated in FIGURES 1 to 4 is of hexagonal shape, but it will be appreciated that the triangular end portions 4 thereof may be modified somewhat if only with an eye to the saving of material. An example of such a modified shape is illustrated in FIGURES 5 to 7, where the apex of the triangle has been foreshortened somewhat by removal of tip material from a point 22 along each of the two edges to define a more obtuse apex angle. In other respects the construction is as indicated in the previous case, and like reference numerals have been used in the drawings for equivalent parts.

When, with this modified construction, the opposed corners of the carton are pushed towards one another, the inner receptacle is again opened out but this time, instead of the apex folding over to one side, two secondary peaks are formed below points 22 and each bends over outwards. This method of folding still leaves the interior of the erected receptacle clear and of full usable volume.

It will be understood that the inner receptacle can be made of many and varied sheet materials but thermoplastic or thermoplastic-coated sheeting or tubing is found extremely practical for many uses, is often of an economic price, can be cut and shaped very easily and, above all,

can be expeditiously and yet most effectively sealed by heated or heat-inducing tools. Thus, for example, Melinex sheet or a polyethylene is advantageously employed except in rare cases where the package is to be used for some acid or other contents having a destructive chemical action.

In one method of forming the individual inner receptacles, two sheets of the chosen thermoplastic are drawn from reels into superposed layers and advanced between heated jaws, which close to join the sheets by peripheral seams of the required shape, i.e. down the side edges and along the top and bottom edges, and cutters which detach the individual blanks. Where layflat tubing is employed the number of sealing seams required is, of course, reduced.

Prior to this closing of the receptacle blank, however, the latter is furnished with the filling and dispensing means. In one arrangement for this purpose, a hole may be punched in one of the sheets and a pouring nozzle, such as 12, is fitted to the receptacle blank at the hole specified, and attached by heat sealing, by adhesive, or in other suitable fashion.

The next stage is to connect the assembled inner receptacle to the pre-cut and scored carton, and for this purpose adhesive is applied to the "inside" surface of the carton body (at the areas indicated above) and the receptacle laid on one pair of the panels, the other pair of panels then being folded over on to the top of it. The abutting free edges of the carton are connected by a strip of adhesive tape, and the pack is then pressed.

I claim:

1. A packaging container comprising an inner receptacle consisting of a closed bag of a flexible sheet material with a filling and dispensing device secured to a wall thereof, and an outer carton intimately enclosing said receptacle, the receptacle and carton being collapsible flat into a laminate, and side walls of the carton and receptacle which stand face to face in the erected container being attached to one another and moving in a common path on erection of the carton.

2. A packaging container comprising a closed bag of flexible sheet material which can be collapsed flat into a double-thickness laminate, and a carton co-extensive with, surrounding, and secured to the side walls of the bag, said carton being collapsible to form, with the collapsed bag, a flat, four-layer pack in which the side edges of the body of the carton are parallel and are in substantial register with those of the bag, whilst the ends of the layers of both of the closed ends of the receptacle are tapered outwards beyond the corresponding ends of the carton body.

3. A collapsible packaging container comprising, as seen in collapsed condition, an inner receptacle consisting of a bag made up of two superimposed, registering layers of flexible sheet material united throughout their common periphery, defined by a pair of parallel side edges and convex upper and lower edges, and an outer carton of which the main body enfolds the flattened receptacle from the exterior and which is made up of four rectangular, side-by-side panels defined by parallel fold lines, each adjacent pair of these four panels together being of substantially the same width as the adjacent part of a layer of the inner receptacle and being cemented to this part.

4. A packaging container comprising a closed bag of flexible sheet material which, collapsed flat, has a rectangular body section with an isosceles triangle extending from each of two opposite sides and having a base of the same length as the side concerned, an outer carton made up of four panels each of a length substantially equal to that of the bag body section and a width substantially equal to one half that of said bag body section, said panels being hingedly connected together along their side edges and secured externally to the faces of said bag body section, end flaps hingedly connected to said panels and of a length less than the height of the respective triangular end sections of the bag, and a filling and dispensing nozzle secured to one of the bag end sections and passing through the adjacent carton flap.

5. A packaging container according to claim 4, in which the nozzle is of tubular form and provided with externally projectnig means for engagement with the associated carton flap, and arranged to trap a pouring chute, rotatable around the nozzle, against this flap.

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