

Oct. 22, 1968

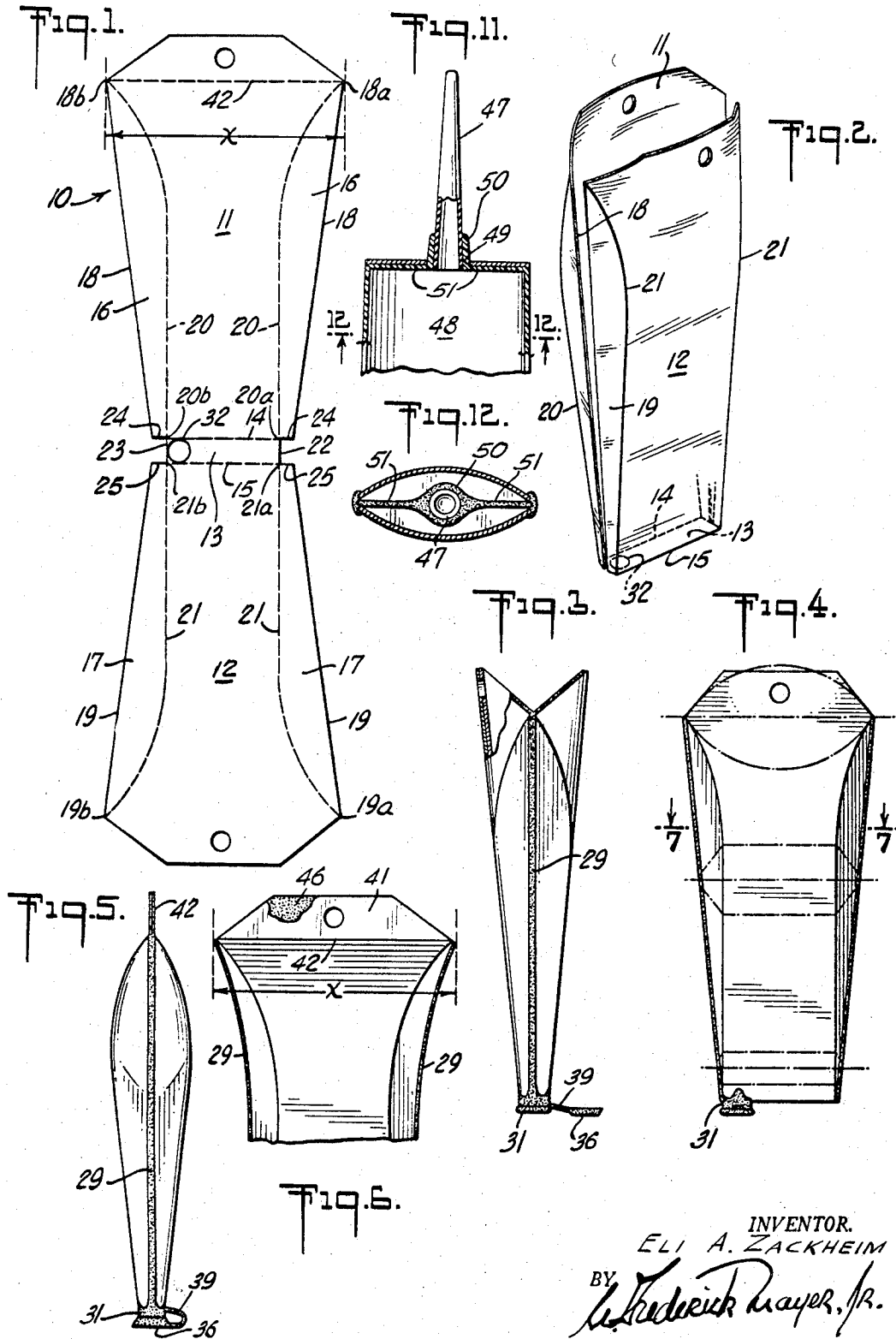
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3,406,873

COLLAPSIBLE CONTAINER

Filed June 15, 1967

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 7.

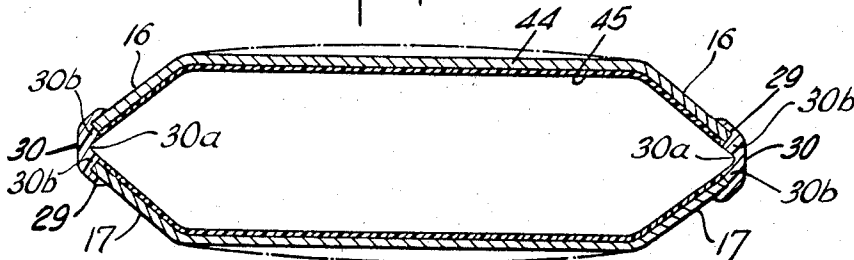


Fig. 8.

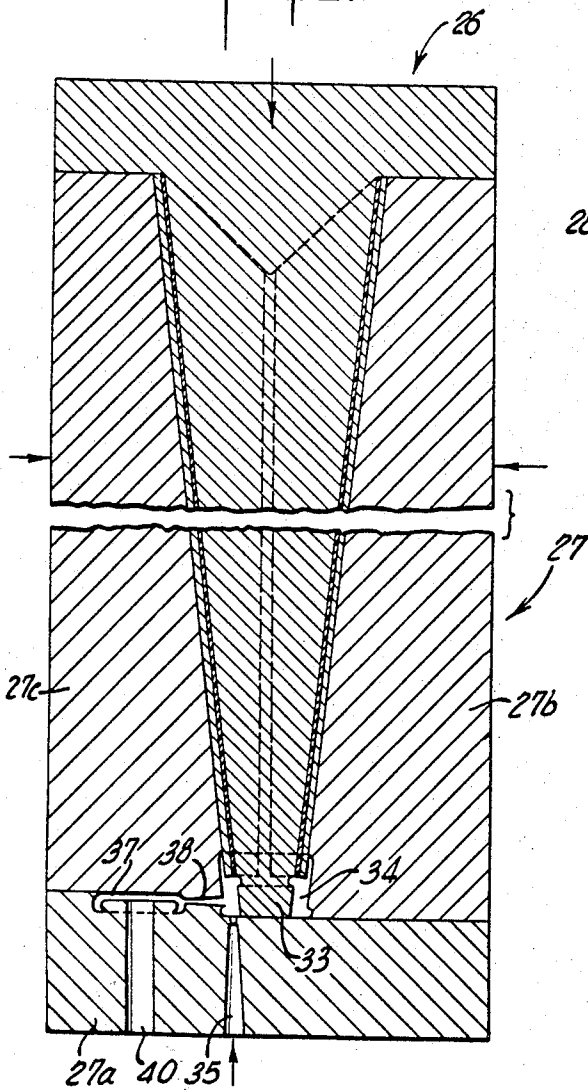


Fig. 9.

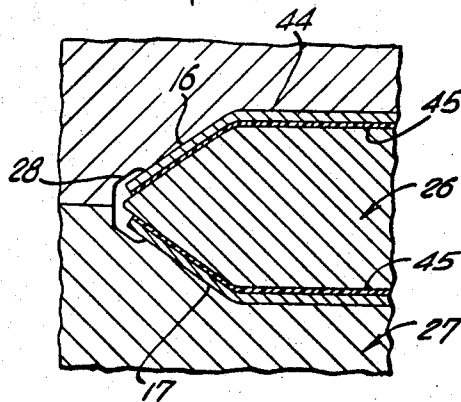
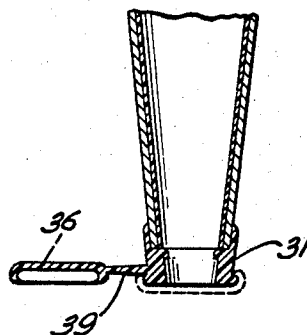


Fig. 10.



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COLLAPSIBLE CONTAINER

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Continuation-in-part of application Ser. No. 503,466, Oct. 23, 1965. This application June 15, 1967, Ser. No. 646,242

10 Claims. (Cl. 222-107)

ABSTRACT OF THE DISCLOSURE

The invention disclosed is a collapsible container formed as a composite of a flat blank of sheet material, folded and joined together into its desired configuration by flexible plastic seams. A dispensing fixture can also be provided which is preferably formed of the same flexible plastic material as the flexible seams.

This application is a continuation-in-part of my co-pending application; now abandoned, Ser. No. 503,466, filed Oct. 23, 1965.

Background of the invention

This invention relates to a collapsible container of the type normally used to dispense toothpaste, shaving cream, and the like and more particularly to one which provides greater economies in the manufacture and greater versatility in the products for which it can be used and in the labeling and decorative effects it can employ.

Summary of the invention

According to the present invention, the improved collapsible container comprises a flat, unitary blank of flexible sheet material folded to present front and rear panels joined together at a first end of the container where preferably a closable dispensing fixture normally is located and plastic interconnecting means joining the front and rear panels along lateral edges thereof, the plastic interconnecting means having thickened web portions extending laterally into secured abutting relationship with the opposed lateral edges of the front and rear panels and a centrally disposed groove extending longitudinally along the juncture of the web portions between the opposed lateral edges of the front and rear panels, the groove permitting flexibility of the plastic interconnecting means in a longitudinal direction to enable facewise displacement of the front and rear panels toward and away from each other, and further, the plastic interconnecting means are sufficiently flexible to permit outward transverse bending thereof to permit face to face sealing of the container at a second end after filling the container with the material to be packaged. Among the advantages the improved container affords are economies in the materials from which the container may be made. Less expensive paperboard may be used instead of more expensive plastic or aluminum sheet. If it is necessary to prevent loss of water vapor or essential oils from the packaged contents, a metallic vapor barrier in the form of foil or plastic film may be coated or laminated on one or both sides. Advantages from a decorative or labeling standpoint or substantial since printing may be accomplished in the flat before the unitary blanks are stamped out. Another advantage resides in the ability of the containers to be shipped in a flat condition prior to filling, thereby decreasing bulk.

In manufacturing the container, a flat blank is stamped out with front and rear panel sections and an intermediate junctional section preferably to comprise the dispensing end of the package. The blank is located in a mold in folded condition in which corresponding lateral edges of the front and rear panels extend into a common cavity

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thereof where they are held in close proximity. The mold may also be provided with cavities at the top to form an appropriate dispensing fixture or to hold an appropriate dispensing fixture in position for inclusion in the container. A thermoplastic material is injected into the mold cavities to form a dispensing fixture or to incorporate a previously formed dispensing fixture and to form also a closing seam interconnecting the front and rear panels along their lateral edges. In accordance with the invention, these lateral seams are designed to enable the interconnected front and rear panels to be pivoted toward and away from each other so that the unfilled container may be flattened for shipment, to be opened at one end for filling, to be sealed at such end for the protection and transportation of the goods and to be moved relatively toward each other to discharge the contents through the dispensing opening.

A better understanding of the invention may be had from the following description read in conjunction with the accompanying drawings in which:

FIG. 1 is a blank of sheet material prior to folding from which a container embodying the invention may be made;

FIG. 2 is a perspective view of the blank of FIG. 1 after folding but prior to the application of the injection molded elements;

FIG. 3 is a side view, partially broken away, of the container of FIG. 2 but after its completion by the injection molding process;

FIG. 4 is a front view of the container shown in FIG. 3;

FIG. 5 is a side view of the container of FIG. 3 with its dispensing fixture closed and after the container has been filled with portions of the face panels at the end of the container opposite the dispensing end sealed in face to face contact to close the container;

FIG. 6 is a fragmentary front view of the container shown in FIG. 5 and with a portion of one of the panels in face to face contact being partially broken away;

FIG. 7 is a transverse sectional view on line 7-7 of FIG. 4;

FIG. 8 is a transverse longitudinal sectional view through a mold suitable for molding the container of the invention;

FIG. 9 is a partial horizontal sectional view through the mold shown in FIG. 8;

FIG. 10 is a fragmentary vertical sectional view through a portion of the container after removal from the mold;

FIG. 11 is a fragmentary vertical sectional view through a container illustrating a different embodiment of the invention;

FIG. 12 is a view looking up at the inner top wall section of FIG. 11.

Referring to the drawings, a blank 10 of appropriate sheet material is stamped from a larger section preferably in form to present two panel sections 11 and 12 of the same shape intended ultimately to form the front and the rear panels of a container (FIG. 1). The blank has a central junctional section 13 of reduced width and which is set off by parallel spaced score lines 14 and 15 along which the blank may be bent to present the front and rear panels 11 and 12 in an opposed face to face relationship, spaced at a first end to a degree indicated by the distance between the parallel score lines 14, 15 (FIG. 2). Each panel 11 and 12 is formed with opposed marginal portions 16 and 17 respectively defined by a lateral edge 18 and 19 which, in the embodiment shown, angle outwardly from the junctional center section 13 of the blank and which terminate at points 18a, 18b and 19a, 19b near the outer ends of the panels. The marginal portions are further defined by score lines 20 and 21 which extend from points 20a, 20b and 21a,

21b where the score lines 14, 15 defining the junctional center section 13 intersect end edges 22 and 23 thereof downwardly, for a distance perpendicular to score lines 14, 15, from whence they curve outwardly to intersect lateral edges 18 and 19 at points 18a, 18b, 19a, and 19b. A definitive boundary of marginal portions 16 and 17 also include edges 24 and 25 which extend for a short distance beyond the ends 22, 23 of the junctional center section 13 and in line with its score lines 14, 15.

In forming the container, the blank is folded along transverse score lines 14, 15 and the panel sections 11, 12, relatively displaced until they extend in the same directions from the intermediate junctional center section 13 which, in the finished container, constitutes its top (FIG. 2). The marginal portions 16, 17, outside score lines 20, 21, are then folded inwardly until their opposed lateral edges 17 and 18 are in juxtaposition. The front and rear panels 11, 12 flare outwardly to provide container space to accommodate the material to be packaged after the longitudinal edges of the blanks have been joined together (FIGS. 3 and 4). In this form the container at the top will have the same dimensions lengthwise and widthwise as the junctional center section 13 between the panels. The widthwise dimension of the container at the bottom between the terminal portions of the longitudinal seams, i.e., between points 18a and 18b and 19a and 19b will be less than the maximum widthwise dimension of the panels due to the curvature of the panels required to provide the volume. In explanation, when the blank has been bent to its final form preparatory to the injection molding operation, the front and rear panel sections 11, 12, adjacent the upper or small end of the container, are flat while the marginal portions of the blank 16, 17, externally of score lines 20, 21, angle inwardly toward each other as shown in the cross section of FIG. 7. Beyond, however, and in the lower areas where the score lines 20, 21 curve outwardly, the panel adjacent its center line continues in a plane of the flat face panel section but outwardly from the center line such panels curve toward each and to the line where the longitudinal edges 18, 19 are in juxtaposition (FIGS. 2, 3, 4).

The bending of the blank to position the parts in their ultimate relative positions prior to molding may be accomplished by or with the aid of male mold section 26 and female mold section 27. The blank may be folded in the manner previously described at least partially about the male section 26 of the mold, prior to its movement into the female section 27, or it may be folded about the male section by the movement of the latter into the female section. When the male mold section is properly located in the female section (FIG. 8) the panel sections for the most part are buttressed at their opposite faces by the walls of the mold sections. In the regions along the juxtaposed edges of the panel marginal sections 16, 17, mold cavities 28 are disposed whose cross section is such as to form a plastic hinge 29 bonded in abutting relationship to the marginal edges of the marginal sections of the container and which will permit such marginal sections and consequently the panels 11, 12 to pivot toward and away from each other (FIGS. 3 and 9). To this end, a longitudinal cavity 28 at opposite sides of the female mold section accommodates the marginal sections 16, 17 along the edges thereof. The mold cavities overlap the marginal panel sections and the injected plastic material in its molten phase upon entering the mold and hardening becomes firmly bonded in abutting relationship to the marginal edges of the marginal panels and to the outer surface of the marginal panels along the extent of such overlap. Then, too, each mold cavity is thinner and in cross section at the juncture 30 between the opposed lateral edges of the panel marginal portions. This reduced cross section forms, in essence, a groove 30a extending longitudinally along the plastic hinge 30 between the opposed lateral edges of the marginal panels 16 and 17.

From the groove 30a, extending laterally, are thickened web portions 30b, which because of their greater thickness, permit securing in abutting relationship the plastic hinge 29 to the lateral edges of the marginal panels 16 and 17. The groove 30a of the plastic hinge 29 permits flexibility thereof in a longitudinal direction to enable facewise displacement of the front and rear panels 11 and 12 toward and away from each other. Thus it is seen, that the plastic hinge structured in this manner, if it is of the appropriate type of plastic, say polypropylene, will readily flex in its longitudinal direction to permit the hinging action.

The container may be molded with a dispensing fixture 31 at the top (FIGS. 3, 4, 8, 10). If this is desired, the blank in one illustrated embodiment, may be stamped with a hole 32 (FIGS. 1 and 2) in the junctional center section 13 through which a portion 33 of the male mold section extends when the mold is closed (FIG. 8). A cavity 34 in the female mold section surrounding this extending section may be in the form of a tube neck and, in small collapsible containers at least, it is preferred that the longitudinal mold cavities 28 along the opposite sides of the container be connected with the neck cavity so that a single gage 35 in one section of the mold can be used to inject thermoplastic material into all the mold cavities. Overlapping of the marginal portions of the dispensing aperture by the mold cavity 34 which forms the dispensing fixture assures a good bond in this region so that the completed container will be tight throughout.

If it is desired the container be provided with a plastic cap 36 molded as an integral part of the dispensing fixture, this may be done by forming the female section of the mold with a lower fixed section 27a, and two upper sections 27b, and 27c movable laterally in manner well known (FIG. 8). In this lower mold section there is a cavity 37 serving as a matrix for the cap 36 and having a connecting cavity portion 38 between the cavity for the cap and the cavity for the dispensing fixture. In this way, a cap 37 which at all times has an anchor 39 with the container and which can be moved to open and close position (FIG. 10) may be molded in one operation. A stripping pin 40 in the lower section of the mold may be provided to displace the molded cap 37 out of the mold cavity as the mold is opened.

The container is ready for filling upon removal from the mold and after the dispensing opening 32 has been closed by moving cap 37 to dot and dash positions shown in FIG. 10. If the container is to be transported from manufacturer to user, substantial savings may be effected by collapsing it, i.e., displacing front and rear panels 11 and 12 toward each other until in substantial face to face engagement. The hinged joint 29 along the lateral edges of the container facilitates this operation in the manner described above.

The container is filled through the end opposite the dispensing opening and with the front and rear panels in their spaced apart positions as molded. The filled container is sealed by bringing the front and rear panels 11, 12 into facewise engagement over an appropriate area 41 beyond line 42 (FIG. 1) at the filling end and sealing. This operation provides a flat flange at the lower end of the tube whose dimension from one lateral seam to the other equals the greatest width x of the blank. As the lower sections of the front and rear panels are moved into facewise engagement to effect the sealing operation, the container automatically shortens as it assumes a convex form 43 between the otherwise flat sections of paneling in the upper region of the container and the sections 41 of the paneling in facewise engagement in the lower region of the container. This shortening of the container requires that the lateral plastic elements 29 flex in the plane of symmetry of the container which is defined by such plastic elements. To state it differently, the lateral plastic elements 29 of the container should be capable of bending outwardly in a transverse direction to accom-

modate face to face secured engagement of the front and rear panels at the lower sections 41 thereof. Such outward transverse bending of the hinge 29 is assured if appropriate plastic material is selected, say again polypropylene, for example.

The blank 10 may be a laminate of paperboard 44 on the outside and foil or plastic 45 on the inside if a vapor block is desired (FIGS. 7 and 9). If the inner laminate is a thermoplastic material and is extended into the areas of the flange 41, closing of the tube by sealing along the bottom can be accomplished by pressure and heat. If the laminate uses foil as the barrier coat, an adhesive 46 may be used on those sections of the container which are to be sealed together (FIG. 6).

A different embodiment of the invention is illustrated in FIGS. 11 and 12. Here a preformed dispensing fixture 47 is associated with the container by locating it, together with a folded blank, in appropriate relative disposition in a mold prior to the injection molding operation. For this purpose, the blank is provided with an aperture 49 somewhat larger than the peripheral dimensions of the base of fixture 47, and through which the fixture extends when in the mold. The shape of the mold cavity and its disposition with respect to the blank's aperture 49 and the dispensing fixture 47 are such that thermoplastic material injected into the mold cavity forms a collar 50 around the fixture with a firm bond between the two. A channel in the mold and which forms a runner 51 permits the collar 50 and lateral seams 52, and 53 to be molded in one operation. The container otherwise may be the same as that in the embodiment previously described.

From what has been said, it is apparent that the invention provides a collapsible container made of a material having all the benefits of paperboard insofar as concerns its ability to accept decorative effects, and which may be printed in large sheets and die cut to provide a plurality of blanks. The paperboard may be laminated or coated with foil or film on one or both side to enhance its utility where a barrier is desirable to prevent loss of water vapor or essential oils. The economical advantages of the improved collapsible container will also permit extension of its use to dispensing packages for such products as jelly, peanut butter, cheese, margarine and the like.

The invention has been illustrated in connection with preferred embodiments thereof but many modifications are included within its spirit. Accordingly, it is to be limited only by the appended claims.

I claim:

1. A composite collapsible container comprising flat blank means of flexible sheet material presenting front and rear panels connected together by a top panel at a first end of said container and plastic hinge means extending longitudinally of said container secured to and interconnecting said front and rear panels along both opposed lateral edges thereof, said interconnecting plastic hinge means having thickened web portions extending laterally into secured abutting relationship with both opposed lateral edges of said front and rear panels and a centrally disposed groove extending longitudinally along the juncture of said web portions between the opposed lateral edges of said front and rear panels, said groove permitting flexibility of said interconnecting plastic hinge means in a longitudinal direction to enable facewise dis-

placement of said front and rear panels toward and away from each other, said interconnecting plastic hinge means further being sufficiently flexible to permit outward transverse bending thereof to accommodate face to face secured engagement of the front and rear panels at a second end of said container permitting closing thereof subsequent to being filled.

2. A composite collapsible container according to claim 1 wherein said plastic hinge means are injection molded into abutting and securing relationship with the opposed lateral edges of said front and rear panels.

3. A composite collapsible container according to claim 1 having a plastic dispensing fixture protruding from and secured to said top panel.

4. A composite collapsible container according to claim 3 in which said plastic dispensing fixture is provided with an openable plastic closure cap.

5. A composite collapsible container according to claim 4 wherein said dispensing fixture and said closure cap are injection molded into secured relationship with said top panel.

6. A composite collapsible container comprising a blank of flexible sheet material presenting a front panel, a rear panel, and an intermediate junctional section, said blank being folded to present said front and rear panels in face to face spaced relationship and with corresponding lateral portions thereof presented with their lateral edges in juxtaposition, and thermoplastic seams extending longitudinally of said container secured to and interconnecting said lateral edges, said thermoplastic seams including thickened web portions extending laterally into secured abutting relationship with said lateral edges and a centrally disposed groove extending longitudinally along the juncture of said web portions between said lateral edges of said lateral portions of said front and rear panels, said groove permitting flexibility of said thermoplastic seams in a longitudinal direction therealong to enable facewise displacement of said front and rear panels toward and away from each other, said thermoplastic seams further being sufficiently flexible to permit outward transverse bending thereof to accommodate face to face secured engagement of end portions of said front and rear panels of said container permitting closing thereof subsequent to being filled.

7. A composite collapsible container according to claim 6 wherein said thermoplastic seams are injection molded into abutting and securing relationship with the lateral edges of said lateral portions of said front and rear panels.

8. A composite collapsible container according to claim 7 wherein said intermediate junctional section is provided with a dispensing aperture.

9. A composite collapsible container according to claim 8 wherein a thermoplastic dispensing fixture is secured to said intermediate junctional section within said dispensing aperture.

10. A composite collapsible container according to claim 9 wherein said thermoplastic dispensing fixture is injection molded into secured relationship with said intermediate junctional section.

No references cited.

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