Dec. 30, 1958 G. A. MOORE 2,866,586

PAPER, PLASTIC CONTAINER WITH DISPENSING CLOSURE

Filed March 28, 1957 2 Sheets-Sheet 1

FIG. 1

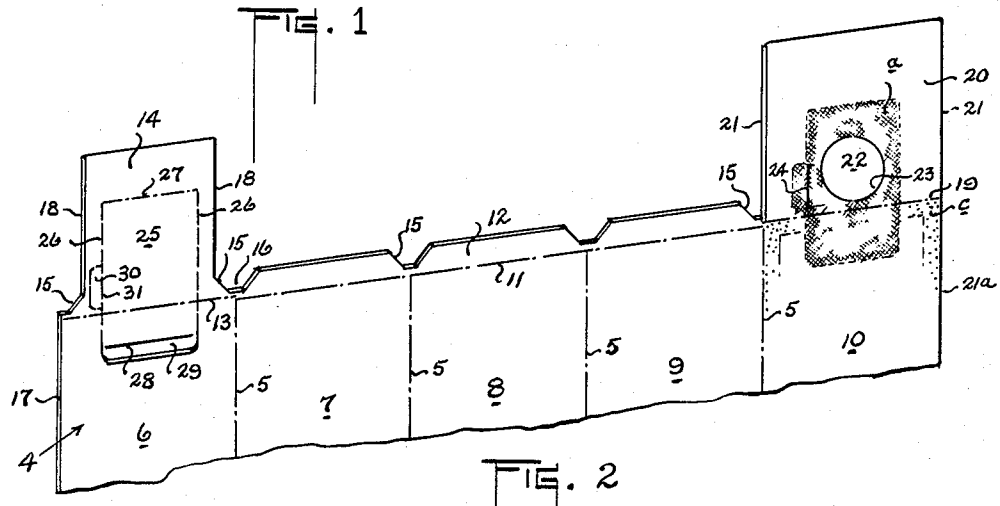


FIG. 2

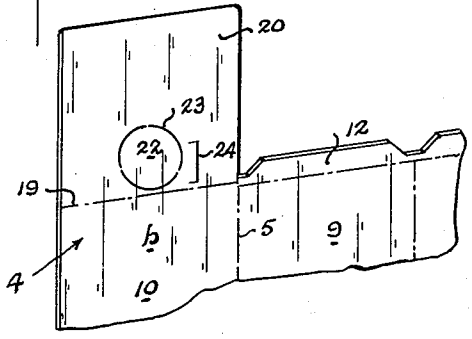


FIG. 3

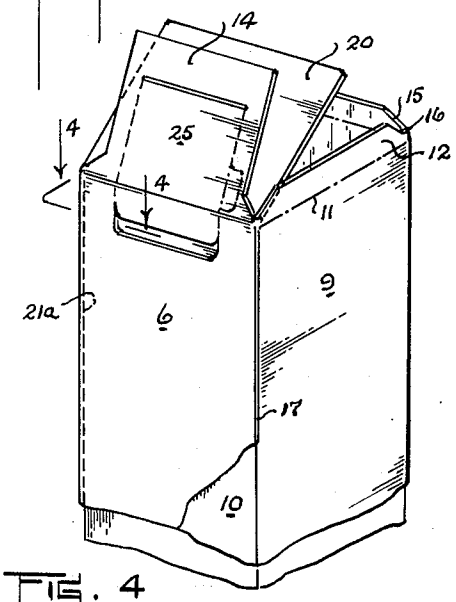


FIG. 5

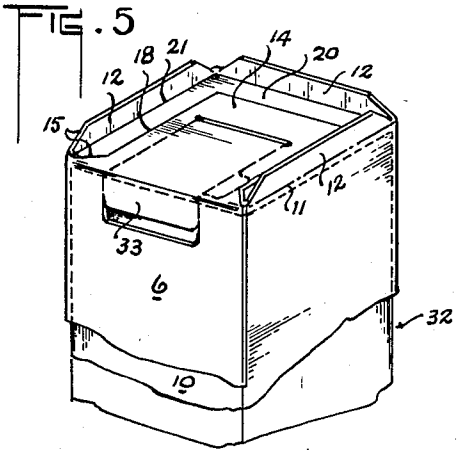
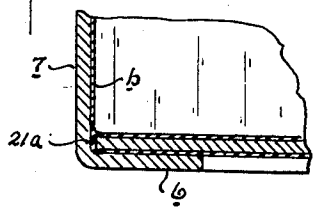


FIG. 4



INVENTOR.

George Arlington Moore

Dec. 30, 1958 G. A. MOORE 2,866,586

PAPER, PLASTIC CONTAINER WITH DISPENSING CLOSURE

Filed March 28, 1957 2 Sheets-Sheet 2

FIG. 6

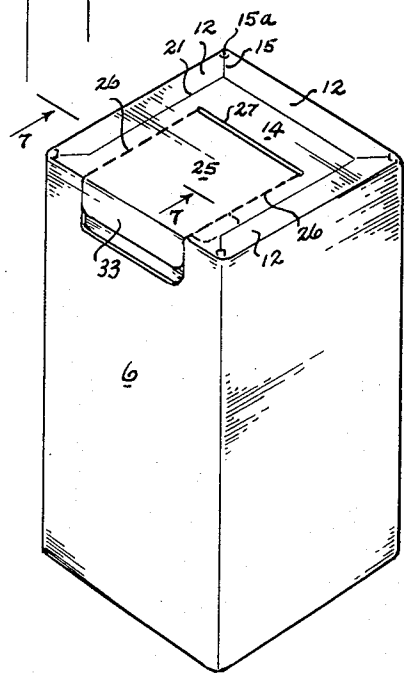


FIG. 8

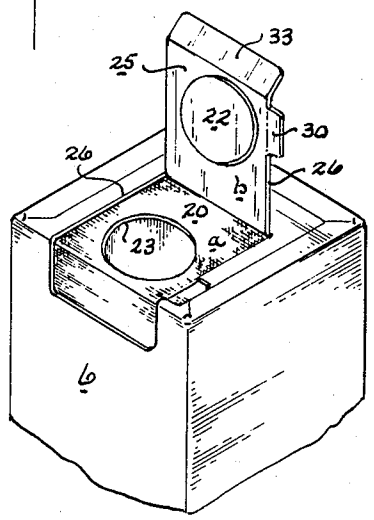


FIG. 9

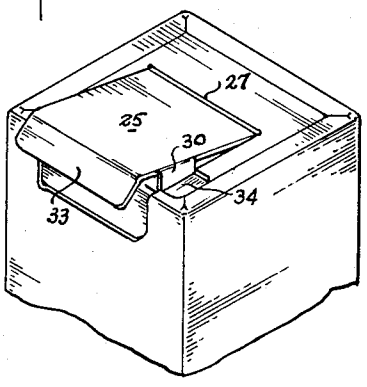


FIG. 7

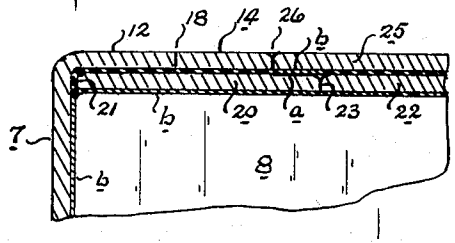
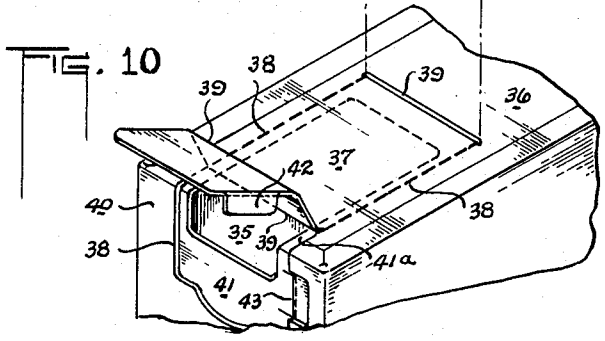


FIG. 10



INVENTOR.

George Arlington Moore

United States Patent Office 2,866,586 Patented Dec. 30, 1958

2,866,586

PAPER, PLASTIC CONTAINER WITH DISPENSING CLOSURE

George Arlington Moore, New York, N. Y.

Application March 28, 1957, Serial No. 649,132

15 Claims. (Cl. 229—17)

This invention relates to sanitary containers of paperboard or other sheet material processed with plastic film materials, and more particularly to novel means and methods of providing bacteriostatic treated interior wall surfaces that are rendered substantially seamless in the structure of the container, including a novel and sanitary dispensing closure construction thereof that may be initially sealed in liquid-tight seam forming relationship, and a particular section of the closure being arranged in a manner that can be manually opened for dispensing purposes of the container without imparting injury or other deleterious effects to the separating plastic surface portions when opening a section of the sealed closure. The arrangement further includes novel means for effecting a sanitary reclosure of the opened section. The invention further contemplates processing thermoplastic film material upon the inner face of the container forming blank and includes a patterned surface deposit of non-thermoplastic lacquer upon a portion of the outer face of the blank to be utilized for the dispensing closure arrangements. Both of the plastic materials utilized for processing the blank being formulated with bacteriostatic treatment.

In my co-pending application, Serial No. 646,986 filed March 19, 1957, for Paper, Plastic Container, a novel arrangement is disclosed wherein a bottom end closure is constructed of an integral panel portion of a wall panel part of one side wall and secured by a series of marginal flanges provided on the ends of the four side walls of the container. Highly desirable results are secured in the prior construction of a closure by providing the end closing panel thereof from the integral portion of the inner disposed panel of a double thickness side wall, the outer disposed panel portion of the side wall providing one of the closure securing flanges surrounding four marginal sides of the closure structure.

The present invention further contemplates a basic closure construction similar to the prior disclosure, but includes a modification thereof having new and novel features of construction that provides an efficient and strictly sanitary dispensing closure for the container wherein particular wall sections of two related closure forming panels are each arranged to co-act in a novel manner in forming and sealing the closure, and when breaking the seal thereof, the wall sections further co-acting to provide a dispensary opening of the container, the exposed opening including its surrounding flat surface areas that are simultaneously exposed, having been bacteriostatic treated and also rendered non-absorbent. The above being one of the primary objects of the present invention.

Another object of the present invention is to provide in a container of the above type wherein the surface structure of the interior walls of the container body including the dispensing closure thereof is rendered substantially seamless by heat-blended meeting surfaces and edges of the thermoplastic film material originally processed upon the container forming blank.

A further object of the invention is to provide a container blank having five wall forming panels, the first and fifth panels adapted to be overlapped and secured to form the body of the container with four side walls rectangular in cross section, the end of the first and fifth wall panels of the blank being extended to provide foldable end closing panels adapted to be folded in shingling relationship from a common corner hinge when forming the closure of the body of the container, the intermediate wall forming panels each being provided with an end foldable flange portion arranged in series adapted for securing the closure when formed.

Another object of the invention is to provide a liquid-tight dispensing closure of the container that utilizes structural portions of one side wall thereof having feature embodiments that co-act with particular transversely disposed wall sections of the closure structure whereby the sealed particular wall sections may be manually separated to open the container for dispensing its intended product and not injure the surfaces of the surface parted wall sections.

A further object of the invention is to provide a novel feature in the structure of the closure wherein the openable section thereof that constitutes the ultimate dispensing orifice is plugged and permanently secured upon the plastic surface of a partially severable wall section of the closure adapted to temporarily remove the plug for container dispensing purposes.

And another object of the invention is to provide novel means whereby the opened orifice may be reclosed in closure retained sanitary relationship periodically during use of the container's intended product.

Other objects and novel features of the invention will appear more fully hereinafter from the following detailed description when considered in connection with the accompanying drawings, wherein a preferred embodiment of the invention is illustrated. It is to be understood, however, that the drawings are utilized for purposes of illustration only, and are not to be construed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawings, wherein similar reference characters refer to similar parts throughout the several views;

Fig. 1 is a partial perspective view of a blank adapted to be formed into a container with dispensing closure of the above type, the view looking upon the exterior surface of the blank;

Fig. 2 is another partial perspective view of the blank of Fig. 1 and looking upon the interior surface thereof;

Fig. 3 is a partial perspective view of the container body formed of the blank of Fig. 1, and showing the novel folding relationship of the closure forming panels of the body portion;

Fig. 4 is a fragmentary portional view of the container body structure shown in cross section taken on line 4—4 of Fig. 3;

Fig. 5 is a partial perspective view of the container showing the closure forming panels in registered end closing position with respect to each other, and with further respect to marginal flange portions of the side walls of the container and prior to being folded, the container body is shown supported upon a mandrel or suitable form;

Fig. 6 is a perspective view of the completed container showing the dispensing closure completely formed and flatly sealed;

Fig. 7 is a fragmentary enlarged view of a section of the closure structure shown in cross section taken on line 7—7 in Fig. 6;

Fig. 8 is a partial perspective view of the container of Fig. 6 and showing a section of the closure after being opened for container dispensing purposes;

Fig. 9 is a partial perspective view of the container of Fig. 8 and showing a partial stage in effecting a reclosure of the container, and

Fig. 10 is a fragmentary perspective view of a container shown elongated in rectangular shape and embodied with a modified dispensing closure construction made suitable for dispensing other than liquid products from the container.

The present invention is particularly directed to a means and method for constructing a container with an initially liquid-tight sealed and sanitary dispensing closure made suitable for handling commercial liquid or viscous products, and/or granular or powdered products such as is intended for the container, and novel means having been provided for finger opening of the sealed closure to expose the dispensary opening without destroying the plastic surface protection provided for the surrounding areas of the opened section of the closure also exposed.

To this end, the blank for forming the container with a closed end is preferably provided with its inner surface covered with bacteriostatic processed plastic film having thermoplastic properties, and thereby provide for efficient interior wall surface protection and seam bonding purposes when constructing the container of the folded blank. The blank is provided with five wall forming panels, two of which panels being adapted to be overlapped with each other when folding the blank, and each associated panel portion providing a closure forming panel, one panel having a partial severable section thereof adapted to co-act in a novel manner with the opening dispensary section when constructing the container of the blank. Each of the above two closure forming panels are adapted to shingle together in relationship from a common corner forming hinge provided by the coincident ends of the side wall forming panel portions adapted to be overlapped with each other. A selective area on the exterior surface of the first closure forming panel having the plugged dispensary opening section thereof and including a surface portion of the corresponding side wall panel portion thereof, being provided with a pattern printed or otherwise applied surface deposit of plastic material that is bacteriostatic treated and completely non-thermoplastic in quality, the pattern plastic coverage of area being substantially coincident with the surface area of the partially severable wall portion that is provided in the second closure forming panel. Upon forming the container and dispensing closure of the folded blank and heat-sealing the inner disposed thermoplastic film surface of the second panel upon the exterior surface of the first panel including an adjacent surface portion of the overlapped side wall by application of heat and pressure, whereby, the meeting surface areas of the closure construction are sealed together in seam forming relationship. The meeting surfaces in the zone of the severable wall section of the closure, wherein the thermoplastic film surface of the second panel meets the patterned non-thermoplastic surface portion on the first panel, are sealed together by surface tension adhesion effected by heat softening of the thermoplastic film portions in engagement and pressing of the panel portions. During this operation however, the cut outlined plug portion of the openable section of the first panel is permanently united with its corresponding surface contacted area of the second panel having the partially severable opening wall section. Hence, when the latter section is manually opened, the cut outlined plug in the first panel is removed by the partially severed section of the second panel thereby exposing an open hole through which to dispense the contents of the container. The surrounding surface area of the opened hole including a transverse portion thereof, being bacteriostatic steril and non-absorbent. After dispensing from the container the opened section may be re-closed and retained in substantially closure forming relationship, the bacteriostatic treated plastic surfaces of the container structure remaining permanently steril.

Referring more particularly to Fig. 1 of the drawings, the present invention is illustrated therein as including a container forming blank **4** which is separated by means of creased lines **5**, into rectangular wall panels **6**, **7**, **8**, **9** and **10** constituting from left to right, five side wall forming panels. The first and fifth wall panels are adapted to be overlapped and secured together to form one double thickness side wall of the body portion of the container and of four side walls arranged in opposing pairs when the blank is folded and secured by the one side wall. The end of the wall panels **7**, **8** and **9**, is defined with a continuous creased line **11** extended longitudinally across the wall panels, one end thereof terminating at the transverse crease line **5** that defines the right boundary of the wall panel **6**, and the opposite end thereof terminating at the crease line **5** that defines the left boundary of the wall panel **10**. Continuous marginal foldable flange portions **12** are disposed on the ends of the wall panels **7**, **8** and **9** articulated thereto along the creased line **11**. The end of the wall panel **6** is defined with a longitudinal creased line **13** that is disposed slightly outwardly of the creased line **11** and the line **13** further defines a corner forming hinge for an outwardly extended foldable closure forming panel **14** of reduced area size. The longitudinally opposed ends of the flanges **12** and the panel **14** are defined with mitred edge portions **15** forming a substantially right angular notch centered on the respective crease lines **5**, the notch having a blunt base **16** disposed short of the creased lines **11** and **13**. A half notch portion is provided at the left boundary edge **17** of the wall panel **6** and at the left boundary creased line **5** of the wall panel **10**. The foldable panel **14** is provided with opposing parallel side edges **18** extended outwardly from the outer ends of mitred edge portions **15** adjacent the base end of the panel. The end of the wall panel **10** is defined with a longitudinal creased line **19** disposed substantially in alignment with the creased line **13** of wall panel **6**, and further defines a corner forming hinge line for an outwardly extended foldable full size end closing panel **20** having parallel straight side edges **21**. The panel **20** is provided with an outline cut severable section **22** thereof constituting an openable portion of the panel having a substantially continuous cut periphery **23**, and a surrounding surface area outwardly of the periphery being coated with a pattern deposit *a* of plastic material having been bacteriostatic treated and the plastic being non-thermoplastic in quality. The deposit coating extends inwardly over the creased line **19** of the panel **20** and upon a surface portion of the wall panel **10**. The deposit *a* preferably covers the periphery defining cut line **23** but does not cover the inner surface area of the cut section. The outer boundary of the coated area *a* is coincident with a severable surface area provided in the panel **14** hereinafter to be defined. A cut line portion **24** is provided in the pattern coated surface area of the panel **20** and disposed outwardly of the cut periphery section **23** and creased line **19** of the panel. The foldable panel **14** of the blank is provided with a partially severable wall portion **25** thereof that is defined with a pair of substantially parallel perforated lines **26** terminating outwardly in the panel in junction with a transversely creased line **27** and lines **26** extending in the opposite direction inwardly into a portion of the wall panel **6** of the blank and terminating at the longitudinal end edge **28** that forms the upper edge of an open cut hole **29** through the wall panel **6**. One of the perforated lines **26** is interrupted with an outwardly extended cut outlined tab portion **30** defined with a base creased line **31** disposed substantially in line with the one perforated line **26**. The surface area of the severable section being coincident with the coated surface portion *a* on the panels **10** and **20** of the blank.

The inner surface of the blank is preferably faced with

specially treated thermoplastic film material *b* as shown in Fig. 2, constituting the opposite face side of the blank to that shown in Fig. 1. The plastic film may consist of polyethylene, vinyls, adhesive treated mylar, or any other suitable plastic film material that may be found desirable for use on the blank. The particular thermoplastic film is preferably formulated with bacteriostatic treatment prior to its embodiment with the structure of the blank. Such film may be applied upon the blank sheet material in the form of extrusion, laminate or coating prior to the cutting and creasing of the blank 4. The blank may be folded to form the body of the container on conventional folding carton machinery equipment. In such event, the wall panel **10** of the blank is folded on its creased line **5** so that the inner face thereof overlaps the inner face of the adjacent wall panel **9**. The wall panel **7** is also folded on its right boundary creased line **5** carrying the wall panel **6** to overlap the folded panel **10** so that the exterior surface thereof meets with the inner surface of the overlapping panel **6**. Heat and pressure is then applied upon the exterior surface of the folded panel **6** thereby activating the thermoplastic engaging surface portion of the overlapping panels and effect the securing of the panel portions together. During the panel securing operation the surfaces of plastic film on the panels **9** and **10** is not activated so that these panels cannot adhere together. In the event the inner surface of the blank is coated with other types of protective plastic material, the exterior surface of the wall panel **10** may be provided with a pattern deposit of thermoplastic adhesive *c* indicated on the panel **10** in Fig. 1 and which may be utilized for securing the folded panels **6** and **10** together. Such adhesive is formulated to be compatible with the protective coated surface of the blank.

Alternatively, the body of the container may be more accurately formed by folding the blank 4 over a mandrel form **32** such as shown in Figs. 3 and 5 whereby the overlapping panels **6** and **10** are secured together in seam forming relationship upon an inner face side of the supporting form. The cut side edge **21***a* of the folded wall panel **10** is brought into abutment with the inner face of the plastic film material *b* adjacent the converging corner formed end of the wall panels **6** and **7** as shown in Fig. 4. Heat and pressure that is applied upon the exterior surface of the panel **6** including an exterior surface portion of the wall panel **7** that is adjacent the corner end thereof, activates the thermoplastic film thereby securing the overlapping panels together in seam forming relationship and blends together the inner disposed surfaces of the plastic film meeting in the edge abutted corner end of the wall panels. The surface abutted edge **21***a* is thereby enclosed by a covering of heat-fused plastic film material of the container body structure in substantially the form illustrated in Fig. 4.

Referring again to Figs. 3 and 5, it will be noted that the blank has been folded to form the container of substantially rectangular cross section, and the end closure about to be formed as illustrated in Fig. 3. In order to effect the closing of the end of the container body and prior to its removal from the form **32**, the closure forming panels **14** and **20** are folded simultaneously together inwardly and downwardly in the same direction from their aligned hinge lines **13**, **19** and while being folded, the panels adjust into shingling relationship upon the end of the mandrel **32** as shown in Fig. 5. The inner plastic face of the folded full end closing panel **20** meeting the end surface of the mandrel for solid support and registered position. The side edges **21** including the end edge of the positioned panel **20** being disposed in close edge to surface abutment upon the corresponding inner plastic film surface portions of the body side walls **7**, **8** and **9** adjacent the creased fold line **11** of the foldable flange portions **12**. It will be noted that a part of the severable wall portion **25** of the simultaneously folded panel **14** is bent on the hinge line **13** at right angles of the panel thereby providing a constituted flange portion **33** of the severable portion **25** in the plane of the wall panel **6**. The extended cut out section **29** of the end of the flange portion is closed by the exterior surface of the inner wall panel portion **10** thereby forming a recess in the panel portion **6** to gain access to the end of the flange portion **33**. The inner thermoplastic film face of the folded panel **14** is engaged flatly upon the corresponding exterior surface of the closure base folded panel **20**. Hence, the thermoplastic film portion upon the inner face of the partially severable wall defined portion **25** of the panel **14** engages upon the patterned surface area *a* of non-thermoplastic material provided upon the exterior surface of the base panel **20** and extended over a portion of the inner disposed wall panel portion **10** of the body of the container. The flanges **12** are each folded on the creased line **11**, inwardly and downwardly so that the thermoplastic film upon the inner face of the folded flanges is disposed upon the corresponding exterior surface portions of the folded base panel **20**, the mitred edges of the closed notch of the flange being brought together and forming a mitre joint by the abutted edges **15** adjacent each of the four converging corner ends of the folded closure structure. The blunt base of the closed notch forms a puckered portion of blank material at the base of the mitred joints inwardly of the outer extremity of the converging corner ends of the closure structure. Heat and pressure is then applied upon the entire exterior surface of the folded closure structure and further upon a marginal exterior surface portion of each side wall downwardly of the corner edges formed by the closure. The heat thereby imposed, activating the meeting surfaces of the thermoplastic film material that is disposed within the closure structure whereby, there is effected a bonded union of the constructed closure in seam forming relationship. The plastic surface abutted edge portions of the closure formed base panel **20** are blended together in heat-fused seamless film surface relationship. The heat activated thermoplastic film portion upon the inner face of the partially severable wall portion **25** of the closure panel **14** being heated and pressed upon the surface area of the non-thermoplastic coated surface area *a* on the surface of the panel **20**, thereby effecting a surface tension adhesion of the incompatible plastic meeting surfaces that is sufficient to initially seal these surfaces areas of the closure and permanently unite the surface area portion **22** of the panel **20** upon a corresponding surface portion of the severable part of the closure panel **14**. The surface tension adhesion is augmented by the outer surrounding permanently bonded surface portions of the closure structure.

The container with its sealed dispensing closure structure is shown in Figs. 6 and 7. It will be noted that the top surface of the completed closure is uniformly flat in coplanar exterior surface relationship, the exterior surfaces of the heat pressed flanges **12** being brought into coplanar surface relationship with the exterior surface of the heat pressed panel **14**. The puckered material at the converging corner ends of the closure formed by the closed notches having been compressed into substantially coplanar surface relationship with the surface of the flanges as shown in Fig. 6 at the corners **15***a*. The base of the folded panel **14** is provided with a pair of mitred edges that form abutment with the mitred edges of the adjacent pair of the opposing folded flanges **12** and thereby forming two of the mitred joints of the closure structure. The hereinbefore described half notch portions of the container blank having been brought together into association that forms a closed full notch and thereby provides one of the two mitred joints with one mitred edge of the panel **14** and a mitred end edge of the adjacent flange.

The sealed structure of the closure is illustrated in cross sectional view in Fig. 7 wherein there is shown the permanently united flange portion **12** upon a correspond-

ing surface portion of the inner disposed base closure panel 20, the side edge 21 thereof being sealed within the corner junctive heat-fused plastic *b* upon the interior surface of the container structure. The cut side edge 18 of the panel 14 is snugly abuted with the longitudinal end edge of the flange 12. The surface portion of the panel 14 extending between its abutted side edge 18 and the perforated cut line 26 therein, is permanently united with a corresponding surface portion of the inner disposed panel 20. The surface portion of the severable portion 25 defined by the perforated lines 26 of the panel 14 is adhered by surface tension effected by the initially heated and pressed plastic film *b* upon the pattern coating *a* extending between the perforate line 26 and the cut line 23 that defines the boundary of the wall section 22 of the panel 20. The cut wall section 22 has been permanently united with a corresponding surface portion of the severable wall portion 25 of the panel 14. It is to be further noted that the outlined cut section 22 of the parent closure forming panel 20 is cut in such manner as to be retained in surface plane with its parent panel during the folding of the blank to form the container and closure as hereinbefore described. The closure panel portion 25 of the parent panel 14 is also retained in planar position with the side wall panel portion 6 and at right angles thereof with the parent panel 14 due to the wall defined connection effected by the perforated lines 26, and further due to the fact that the panels 14 and 20 have been simultaneously folded while in surface contact during their swinging movement through ninety degrees in the same direction and in a manner constituting a shingled two-ply panel non-adhered while forming the closure structure. Therefore, the base closure forming panel portion 20 flatly supports the panel portion 14 during the folding operation thus keeping the defined sections 22 and 25 thereof in flat co-planar surface position prior to the sealing of the closure. For the above reasons advanced, it can be seen that the structure of the closure described has been efficiently heat-sealed in liquid-tight seam forming relationship, effected by the activated thermoplastic film surface *b* that produces the surface tension adhesion to the surface of the patterned plastic *a*, and augmented by surface retaining effects produced by the permanent united wall sectional portion 22 with the corresponding surface portion of the wall 25. The basic seal of the closure is effected by the permanently united surface portions extending outwardly of the pattern coated surface portion *a* thus, further augmenting the surface tension adhesion sealed portion of the closure.

Referring to Fig. 8, the sealed closure may be easily opened by one's fingers lifting and pulling upwardly on the flange portion 33 of the closure thereby severing the wall portion 25 along the perforated lines 26 which removes the wall section 22 from the wall 20 and thereby expose a dispensary opening having a peripheral edge 23. This edge defining periphery has been initially chamfered as shown in Fig. 7 at the cut penetrating line 23, the chamfer edge is substantially covered with the plastic *a* including the exposed surface area of wall portion 20 effected by the severed and raised wall portion 25 of the panel 14 and bent on the hinge line 27. As hereinbefore described, the separated wall surfaces had been heat-sealed together by surface tension adhesion because of the incompatible relationship of the plastic materials *a* and *b*. Therefore, when separating these surface sealed areas, they will part without injury to their respective surfaces. During the dispensing of liquid contents from the opened container, the surface area *a* can not absorb any portions of the pouring liquid nor residual drops thereof, and the surfaces having been bacteriostatic treated, can not become contaminated. Hence, the dispensary areas of the closure is rendered strictly sanitary. After dispensing a portion of the container contents, the opened section may be closed and retained to effectively close the dispensary opening by restoring the plug 22 therein upon closing the initially severed section 25 on the hinge line 27 which will influence the register of the plug to properly fit into the opening substantially as initiated. To retain the reclosure, the tab portion 30 is bent inwardly by the fingers and guided to enter into the slit opening 24 as shown in Fig. 9. Further pressing of the wall portion 25 downwardly, inserts the tab into the slit and the friction imposed by the tab's engagement overcomes the inherent spring of the material of the partially severed wall portion and thereby effectively retains the reclosure in substantially flatly engaged relationship with the permanent wall portions of the closure.

A further modification of the closure is shown in Fig. 10 wherein novel features are employed to provide a closure suitable for dispensing products intended for the container other than liquids. An enlarged opening 35 is cut continuously through a portion of the panel portions 41 and 41*a* and initially sealed by the severable wall portion 37 of the panel 36. The closure is adapted to be opened in stages for convenience of container dispensing purposes. The closure panel 36 is provided with a partially severable wall portion 37 defined with a pair of substantially parallel perforated lines 38 and three openly spaced parallel creased hinging lines 39 extending transversely between the perforate lines 38. The flange end of the panel portion 37 that was initially disposed in planar sealed relationship with the side wall panel portions 40 and 41, is shown in an open position after having been severed from portions of the perforate lines 38, and is bent upwardly on its second hinge line 39. Thereby, exposing the opening 35 provided in an upper portion of the panel wall portion 41 and a portion of the inner disposed folded panel 41*a*. This functional feature of the closure arrangement provides convenient means to pour granular, powdered or other dry products frmo the container. The closure may be further opened by pulling the panel wall portion 37 upwardly to further sever the sides thereof inwardly to the third hinge line 39 and thereby expose the maximum area of opening provided in the closure. The opened section of the closure may be restored in closed position in the same manner hereinbefore described for the reclosure illustrated in Fig. 9. However, the location of the tab locking arrangement has been modified as shown in Fig. 10. Upon reclosing the opened section of the closure, the tab portion 42 of the wall portion 37 is inserted into the slit section 43 provided in a vertical position in the wall panel portion 41 to conveniently lock the reclosure in secured position.

While a modification of the invention has been illustrated and described, it should be obvious by those skilled in the art, that various other modifications may be made due to the facilities afforded by the disclosed structure of the container side walls and closure co-acting arrangements illustrated and described with considerable detail, therefore, it will be expressly understood, by those skilled in the art, that various changes may be made therein without departing from the spirit of the invention. Reference will therefore be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A flat blank of foldable material adapted to be formed into a container having a rectangular cross section and a closed end, said blank comprising a sheet of said material having its inner surface coated with thermoplastic film material and provided with creased lines defining from left to right, five rectangular side wall forming panels and cut to define two foldable closure forming panels and three foldable substantially continuous marginal closure forming flanges all disposed in base longitudinal foldable alignments defined with creased hinge lines, a first said foldable panel of said two panels being integral with the fifth wall panel and provided with a creased hinge line, the second foldable panel being integral with the first wall panel and provided with a

creased hinge line disposed substantially in alignment with the hinge line of said first foldable panel, said foldable continuous flanges being integral with the second, third and fourth wall panels and provided with a substantially continuous creased line disposed slightly outward of said hinge lines defining the end of the first and fifth wall panels, each integral marginal flange having opposite end edges that are mitred to form a substantially right angular notch with the mitred end edge of the adjacent flange, said notch having a blunt base short of said continuous creased line and the notch being centered on the creased line that defines the wall panel, the base of said second foldable panel being provided with a pair of opposed mitred edges outwardly of its creased hinge line to complement a mitred end edge of the marginal flange of the second and fourth wall panels whereby, upon folding the blank to form the container said notches are closed to form mitred joints that extend inwardly of the corner ends of said side wall panels and are in the plane of the closure forming panels thereof.

2. A container of sheet material comprising a tubular body portion of substantially rectangular cross section having side walls and a flat end closure for said body portion, said end closure including two end closing panels folded simultaneously in the same direction inwardly and downwardly in shingled relationship from a common corner hinge formed at coincident ends of two wall panels that provides said end panels, and said wall panels being overlapped and secured together constituting one side wall of the container body portion, each of the other side walls being provided with substantially continuous marginally folded flanges articulated thereto along a continuous fold line that defines the end of said side walls, said flanges having mitred opposite end edges forming mitred joints adjacent each converging corner end of the closure, the inner surface of the folded flanges being secured upon corresponding surface portions of the folded inner disposed end closing panel, the folded outer disposed end closing panel being provided with a pair of opposed mitred edges that complements the mitred edges of a pair of the flanges that are folded in parallel with the extended side edges of said outer panel and from its mitred edge portions, said edge portions forming a pair of said mitred joints, the exterior surface of said outer folded panel and folded flanges being disposed substantially coplanar in surface relationship and the inner meeting surfaces of the closure structure being united together in liquid-tight seam forming relationship.

3. A flat blank of foldable sheet material adapted to be formed into a container having a rectangular cross section and a closed end that is adapted to be formed into a dispensary closure, said blank comprising a sheet of said material being prior processed with inner surface covering of plastic film material having thermoplastic properties, and a selective surface portion of its outer surface being printed or otherwise applied with plastic material not having thermoplastic properties, said sheet of material being provided with creased lines defining from left to right, five rectangular wall panels and cut to define two foldable end closing panels and a series of foldable marginal continuous flanges disposed longitudinally between said foldable panels, one of said foldable panels being integral with the fifth wall panel of the blank and provided with a creased hinge line that defines the end of said wall panel, said foldable panel portion thereof being provided with an outlined cut section of its wall adapted to be periodically removed and restored after the container is formed of the blank, a selective surface area of said one panel extending outwardly from the defined boundary of said cut section therein being covered with said applied non-thermoplastic material and the coverage extending inwardly over a portion of the parent wall panel, the second of said foldable panels being integral with the first wall panel of the blank and being provided with a creased hinge line disposed substantially in alignment with the hinge defining line of the other foldable panel, said second panel having a pair of opposed mitred edge portions extending outwardly of its creased hinge line and joined with further extended straight side edge portions, said series of marginal flanges each having mitred opposite end edges forming a substantially right angular notch with the mitre edge of the adjacent flange and the notch being centered on the creased line that defines the wall panel, a mitred edge portion of said second panel complementing the mitre edge of an adjacent flange in forming one of said notches, the other mitre edge portion of said panel complementing the mitre edge of the flange that is adjacent the foldable panel of the fifth wall panel when folding said blank, said series of flanges having a continuous creased line disposed slightly outward of the aligned hinge defining lines of the two foldable panels, said second panel being provided with a partial severable wall portion thereof that extends inwardly into a portion of its parent wall panel and the transverse cut end thereof defining an outer edge of a cut out opening provided in the parent wall panel, and the surface area of said severable wall portion being substantially coincident with said selective coated surface area on the other foldable panel and its parent wall panel.

4. A flat blank as set forth in claim 3 wherein said plastic materials prior to being processed upon the inner and outer surfaces of the sheet material of the blank, being formulated with bacteriostatic treatment so that when the blank is folded to form the container with dispensary closure, the interior surfaces of the resultant structure formed of the blank is rendered steril.

5. A container of folded sheet material substantially impervious to liquids comprising a tubular body portion rectangular in cross section having side walls arranged in opposing pairs and one of said side walls being formed of two wall panel portions overlapped together in surface secured relationship, the side walls having a closed end provided with a flat dispensary closure, said closure including a full size end closing panel folded from the corner end of the inner disposed wall panel portion of said one side wall, the three side edges of said folded panel being flatly sealed in abutment upon corresponding interior surface portions of the edge opposing side walls of the container, and marginal exterior surface portions of the folded panel adjacent its abutted edges being covered and secured with marginal continuous flanges folded inwardly and downwardly from the corner ends of said edge opposing side walls, the folded flange portion of each side wall being provided with an arrangement of end defining mitred edges that complements the mitred edge of the adjacent folded flange and forming a mitred joint that seals the corner ends of said folded panel, another foldable end closing panel being folded inwardly and downwardly from the corner end of the outer disposed panel portion of said one side wall and being disposed upon a corresponding surface portion of the flange secured inner folded panel, the outer folded panel being provided with a pair of opposed mitred edges that complements the adjacent mitred end edges of one pair of said folded flanges that are transverse of the fold corner end of the outer panel thereby forming two of said corner sealing mitred joints, said outer panel being provided with a partially severable wall portion having a flange formed portion remaining in the plane of the outer disposed panel portion of said one side wall, the inner disposed folded panel having a dispensary openable wall portion permanently secured with the overlapping severable wall portion of the outer panel and being adapted to temporarily remove said openable portion of the inner panel when severing said outer wall portion to open the container for dispensing purposes.

6. A container of sheet material that is provided with its inner surface covered with thermoplastic film material and a pattern portion of its outer surface being coated with non-thermoplastic material, both of said plastic mate-

rials having been originally formulated with bacteriostatic treatment, said container comprising a body portion of substantially rectangular cross section having four side walls arranged in opposing pairs, one of said side walls being formed of two wall panels overlapped and united together effected by heat activation and pressing of the coincident thermoplastic film material, the longitudinal end edge of the inner disposed wall panel portion of overlapped panels being disposed in heat sealed abutment upon a corresponding interior surface portion of said thermoplastic film material adjacent the converging longitudinal corner end of the outer disposed wall panel portion, said inner and outer overlapped panels that forms the one side wall, each being provided with a folded integral panel portion, both of said panels having been folded in shingling relationship from a common corner hinge formed by the coincident related ends of said overlapped wall panels, the inner disposed folded panel entirely closing the end of said body portion and its side and end edges being abutted against the interior thermoplastic film surface of the edge opposing side walls, a portion of the wall of said inner panel being provided with an outlined cut section that initially remains in the plane of the panel and constituting a removable dispensary portion of the panel, a selective surface area outwardly surrounding said outlined cut section being coated with said non-thermoplastic material, the outer disposed folded panel being disposed upon a corresponding surface portion of the inner panel and having a pair of opposed mitred side edges extended inwardly of its folded corner end that covers and aligns with the corner end of the folded inner panel, said mitred edges having extended straight side edge portions terminating short of the end abutted edge portion of the inner panel, the ends of said side walls that oppose the side edges of the inner folded panel being provided with substantially continuous marginally folded flanges, the thermoplastic film surface thereof being disposed downwardly upon corresponding exterior surface portions of said inner panel, said folded flanges having mitred end edges complementing said mitred edges of the outer folded panel and thereby forming mitred corner sealing joints at the four corner ends of the folded closure, the outer folded panel including an adjacent portion of its parent side wall panel portion being provided with a severable wall portion defined with a pair of cut weakened lines extending from a transverse cut end edge disposed in the parent side wall panel and terminating in the wall of the folded panel in junction with opposite ends of a creased hinge forming line extending between the weakened lines, the inner thermoplastic film surface of said severable wall portion being flatly disposed upon said selective surface area of non-thermoplastic material on the inner panel including the surface area of its outlined cut section that is free of said non-thermoplastic material, heat and pressure being applied upon the constructed closure including a marginal surface portion of the adjacent side walls whereby, the interior thermoplastic film meeting surfaces and edges formed in the structure is activated thereby sealing the closure in liquid-tight seam forming relationship, the coincident meeting surfaces of said severable wall portion of the closure with the corresponding surface of the inner panel effecting a permanently bonded union of said outlined cut dispensary section thereof including surface tension adhesion effected by the heated plastic film that initially seals the balance of the defined dispensary surface areas in engagement and augmented by the permanently sealed surface portions of the closure.

7. The container as set forth in claim 6 wherein the dispensary section of the defined closure structure may be opened for container dispensing purposes by partial severing of the outer wall portion that is surface tension adhered upon said non-thermoplastic surface portion of the inner panel, said outlined cut sectional portion of said panel being removed by its permanent attachment upon the inner surface of the severed wall portion thereby exposing an open hole in the inner panel, the parted surfaces of the plastic materials being intact and not injured by the separation effected by the initially applied non-thermoplastic surface material thereof, the surfaces of the opened section exposed being non-absorbent and sterile, said opened section of the closure being provided with means with which to effect a retained reclosure of the opened section.

8. A folded sanitary dispensary closure for a container having side walls arranged in opposing pairs of substantially rectangular cross section and one of said side walls being constructed of two wall panel portions overlapped together and with engaging surfaces secured in seam forming relationship, said dispensary closure including an inner and outer end closing panel being provided by foldable integral wall portions of said two wall panel portions and each end closing panel being folded in the same direction inwardly and downwardly in shingling relationship from the coincident corner ends of said one side wall of the container, the other three adjacent side walls having integrally related flange portions that are folded and with end edges thereof that are in complementing relationship with end edges of said folded outer panel, said folded flange portions providing means for securing the inner end closing panel in sealed position including the four corner ends of the closure structure, said inner and outer panels each being provided with an openable wall portion being arranged to co-act together when being surface separated to provide a reclosable dispensary opened section of the closure to be utilized for dispensing purposes of the container contents.

9. A folding carton-like container having side walls to provide a body portion of substantially rectangular cross section, one of said side walls being formed of two overlapping wall panels surface secured, said body portion having a closed end arranged with dispensary openable wall sections, which comprises an inner and outer end closing panel portion integral with the inner and outer disposed overlapped wall portions respectively of said one side wall, and both of said end closing panels being folded in the same direction inwardly and downwardly of the coincident corner ends of the overlapped wall portions thereof, said panels being sealed in secured seam forming relationship in conjunction with marginally folded flange portions of the other side walls of the container, the inner folded panel being provided with a cut-out section that extends at right angles into a portion of its parent wall panel, the outer folded panel being provided with a severable portion of its wall defined with a pair of weakened cut lines spaced outwardly of the side edges of the cut section of said inner panel and extending across the outer panel from a transverse creased line spaced outwardly of an end edge of said cut out section and disposed between said weakened cut lines, and the lines terminating at right angles downwardly into a portion of its parent wall portion, said defined severable wall portion being further provided with another transverse creased line spaced inwardly of the corner hinge of the outer folded panel, the wall portion of said severable panel portion that is disposed in the plane of its parent wall panel having a finger tab bendable portion extended outwardly of a side edge thereof and further defined with a weakened cut outline, the inner wall panel portion adjacent the overlying tab being slit to provide a yieldable wall portion adapted to receive an insertion of said tab portion when bent and after the initial opening of the dispensary closure is effected for container dispensing purposes.

10. The method of forming a container with a dispensary end closure, the container having four side walls arranged to provide a rectangular cross section from a flat paper board blank having formulated bacteriostatic treated thermoplastic film material upon its inner surface and including a pattern plastic coated surface area

provided upon a particular portion of the outer surface, the latter plastic material being formulated with bacteriostatic treatment but defined as not having thermoplastic properties, the blank being provided with five rectangular wall panels, two of which wall panels are overlapped together and surface secured to form one side wall of said four side walls, the inner wall panel thereof being provided with a foldable end closing panel having an outlined cut section to define a removable wall portion thereof, the surface area of said cut section being disposed within an uncoated sectional portion of said pattern plastic coated surface, the outer wall panel of said one side wall being provided with another foldable end closing panel having a perforated severable wall portion thereof that extends into its parent wall portion and the defining surface area thereof that is coincident with said pattern plastic coated surface area on the blank, said method comprising folding both of the end closing panels in the same direction inwardly and downwardly in shingling relationship from the coincident ends of the parent wall panel portions of said one side wall, and securing the folded position of said folded panels by folding marginal continuous flange portions of the three other side walls into engagement with corresponding exterior marginal surface portions of the folded inner disposed end closing panel, during the folding of said flanges, bringing mitred edges cut on the opposite ends thereof into abutting relationship to form mitred joints that structurally closes the corner ends of the closure structure complemented by mitred edge portions provided on opposite sides of the folded outer disposed end closing panel, a wall portion of the latter folded panel remaining in the plane of its parent wall panel of said one side wall, heating and pressing the surfaces of the closure structure including surface portions of the adjacent side walls to activate the thermoplastic film material in said structure and thereby seal the structure in liquid-tight seam forming relationship, the portion of the thermoplastic film material heat pressed upon the pattern coated plastic surface effecting surface tension adhesion thereby sealing the openable section of the closure in a manner that may be surface separated without imparting injurious or other deleterious effects to the surfaces when separated, and said openable section of the inner panel withdrawing from its established position by the co-acting outer panel portion when effecting said surface separation, the surface portions of the closure exposed by opening being non-absorbent and steril effected by said plastic materials utilized in forming said structure.

11. A flat dispensary closure construction for a container of a foldable sheet material faced on its interior surfaces with thermoplastic covering material and having side walls arranged in opposing pairs to provide a body portion of substantially rectangular cross section comprising one of said side walls being formed of double thickness defining an inner wall and an outer wall adhesively bonded together in overlapping relationship, said inner and outer wall portion being provided with an integral end segment folded at right angles of its dependent wall portion and in shingling relationship defining closure forming panels adhered together, the inner panel having its three side edges disposed in edge to surface abutments adhered upon the interior surface of the other three side walls of said body portion, each of the three walls being provided with a marginal flange portion folded inwardly and downwardly in seam forming relationship upon corresponding surface portions of said inner panel, said flanges each having mitred opposite ends complementary with each other forming mitre joints disposed inwardly of the corner ends of said body portion, the outer panel being provided with a pair of mitred edges extended inwardly from the terminal ends of its fold corner edge in complement with the mitred end of two opposed flanges forming a pair of said mitred joints, said outer panel having three side edges disposed in substantial abutment with the longitudinal edges of said flanges upon the inner panel whereby the exterior surface of the constructed closure is coplanar and both the body and closure being strongly reinforced against distortion by said secured flanges and mitred joints.

12. A flat dispensary closure according to claim 11 wherein said inner panel is provided with a cut section defining an openable portion of the panel and adjacent said cut section a yieldable slit line, said outer panel being provided with a pair of perforated cut lines spaced inwardly of the parallel side edges of the panel and the end of said lines being initiated in junction with a transversely disposed score line spaced inwardly of the end edge of said panel, said cut lines being extended across the panel and into a portion of the outer wall portion of said double thickness side wall of the body portion and terminating into an open slot provided through the outer wall portion thereby constituting a right angle flange portion extended downwardly of the face of the outer panel, one of said perforated lines being cut to outline a bendable tab portion of the panel overlying said yieldable slit line in the inner panel, said tab being adapted to be inserted into said slit line after the outer panel portion defined by said perforated lines is opened by severing the lines and upon restoring the closure, said insertion providing means to retain the reclosure.

13. A flat dispensary closure according to claim 11 wherein the exterior surface portion of said inner panel and dependent inner side wall portion overlapped by the openable wall portion of the outer panel and outer side wall portion being coated with a pattern dry film of material that is substantially incompatible with said thermoplastic covering material upon the inner surface of the outer panel, said pattern defining a surface area inwardly of said perforated lines but excluding the inner surface area portion defined by said cut openable portion of the panel whereby upon sealing the constructed closure by application of heat and pressure the pattern coated surface area in contact with the thermoplastic coating upon the overlying panel will be surface adhered but adapted to be separated in a manner to avoid rupturing the material of each panel when opening the dispensary closure.

14. A flat dispensary closure according to claim 11 wherein the inner panel and its dependent side wall portion may be provided with an extended cut out section thereof with its side edges spaced inwardly of said pair of perforated cut lines of the outer disposed panel and outer wall portion of said side wall, the right angular disposed flange portion of the outer panel extending beyond the end edge of said cut out section disposed in the inner wall portion of the side wall, said flange portion being provided with a bendable tab outlined in one of said perforated cut lines and disposed in a portion of the outer side wall portion, a yieldable slit line being provided in the inner side wall portion overlapped by said tab portion, the outer side wall portion having a cut out section to expose the end edge of the flange portion of the severable part of said outer panel for finger access to said flange.

15. In a container lined with thermoplastic film material and having side walls arranged in opposing pairs to provide a body portion substantially rectangular in cross section and a dispensary end closure for said body portion, said end closure comprising two end closing panels arranged in shingled relationship and folded inwardly and downwardly from a common end of integrally related side wall portions arranged in overlapped relationship constituting one of said side walls of the body portion, the inner panel having its side cut edges firmly abutted and secured upon corresponding inner surface portions of the three other side walls and each of said three walls being provided with a marginal flange portion substantially continuous with the other flanges and having mitred junctions with each other adjacent the corner ends of said body portion, the folded base end of

said outer panel being provided with one pair of opposed mitred edges complementing the mitred end of two opposed flanges, said flanges being folded inwardly and downwardly upon corresponding exterior surface portions of said inner panel in seam forming relationship, said mitred edges forming mitred joints inwardly of the four corners of said body portion also in seam forming relationship, the side edges of said outer panel being substantially abutted upon the longitudinal end edges of said folded flanges, the inner panel being provided with an open cut section constituting an opening for dispensing purposes of the container contents, the surface area of the panel adjacent said opening being covered with non-toxic plastic coating that is substantially incompatible with said thermoplastic covering on the inner surface of the outer overlapping panel, the latter panel being provided with perforated lines extended at right angles into a portion of the outer wall part of said one side wall thereby defining a severable section of the outer panel part of the closure, said body portion being fitted over a mandrel mechanical part giving support upon the inner surface of said inner panel while heat and pressure is

applied upon the exterior surface of the closure including the surface of the transversely disposed flange portion thereof, whereby said thermoplastic film material on the panels and flanges is activated to bond the closure in liquid tight condition, said surface area adjacent the opening in the inner panel being surface adhered adapted to be cleanly separated upon opening the perforated boundary section of the outer panel and adjacent side wall part thereof for container dispensing purpose.

References Cited in the file of this patent

UNITED STATES PATENTS

1,746,006	Metzger	Feb. 4, 1930
1,811,074	Butler	June 23, 1931
1,931,213	Wheeler	Oct. 17, 1933
2,288,914	Monroe	July 7, 1942
2,324,807	Wentz	July 20, 1943
2,390,412	Axberg	Dec. 4, 1945
2,470,388	Ball	May 17, 1949
2,735,604	Zerlin	Feb. 21, 1956
2,737,337	Moore	Mar. 6, 1956