Sept. 18, 1956 C. R. ALDEN 2,763,424

PANEL STRUCTURE AND BLANK FOR CONTAINERS

Filed Feb. 4, 1952 2 Sheets-Sheet 1

Fig. 1

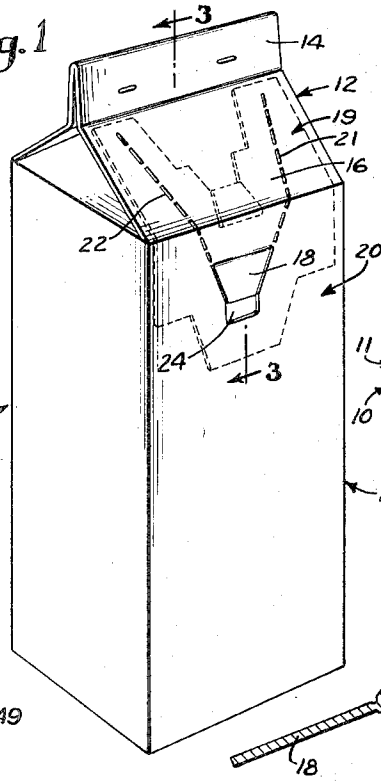


Fig. 2

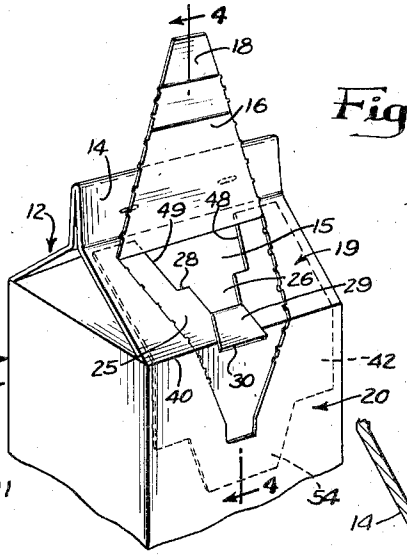


Fig. 4

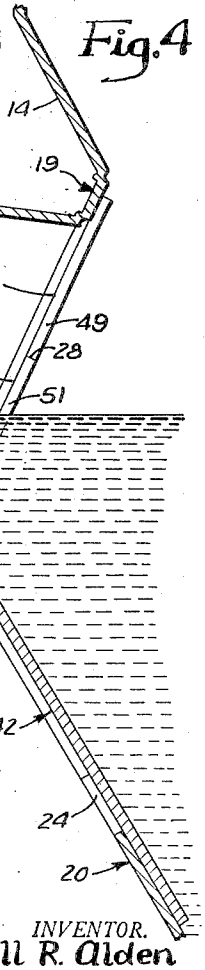


Fig. 6

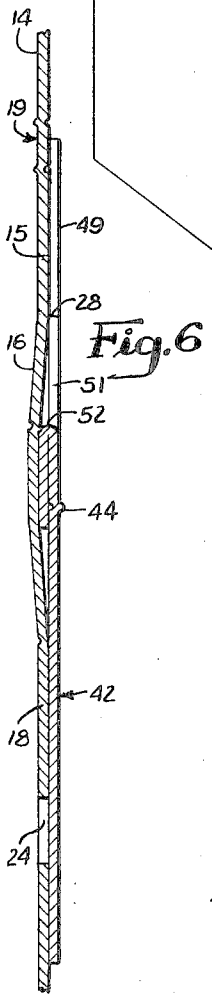
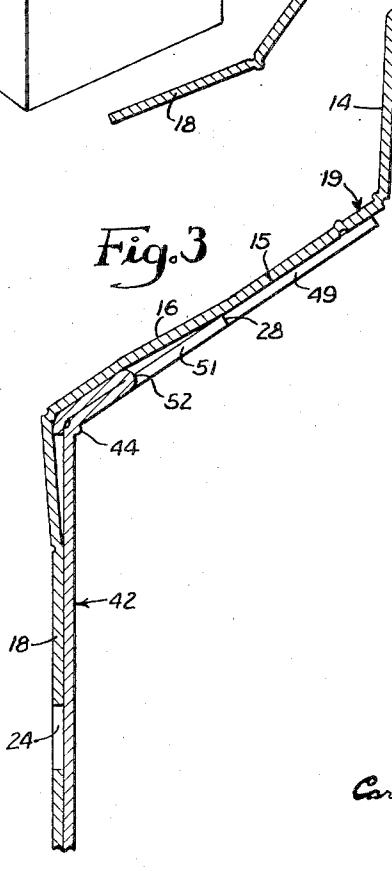


Fig. 3



INVENTOR.
Carroll R. Alden

BY
Carlson, Pitzner, Hubbard & Wolfe
Attys.

Sept. 18, 1956 C. R. ALDEN 2,763,424

PANEL STRUCTURE AND BLANK FOR CONTAINERS

Filed Feb. 4, 1952 2 Sheets-Sheet 2

Fig. 5

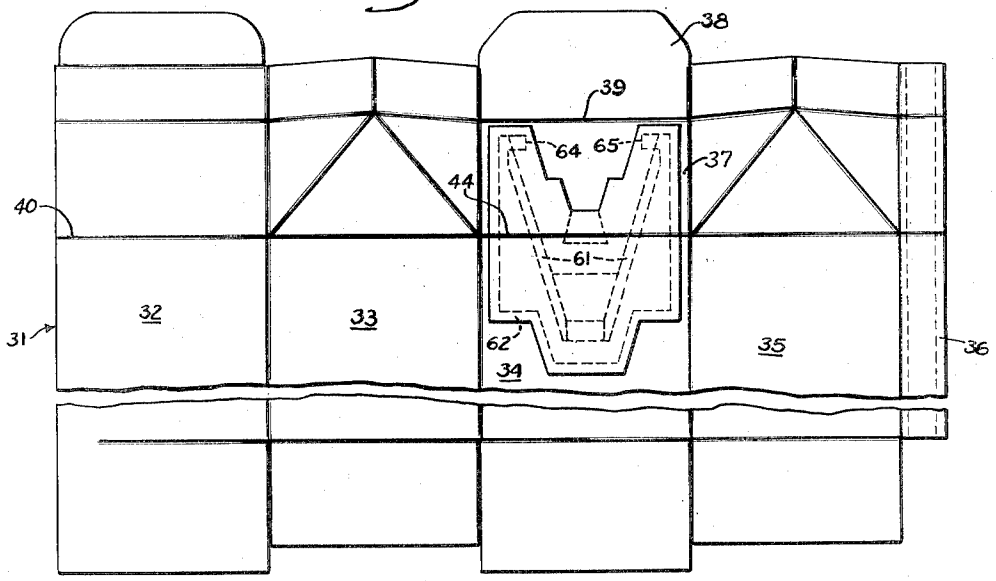


Fig. 8

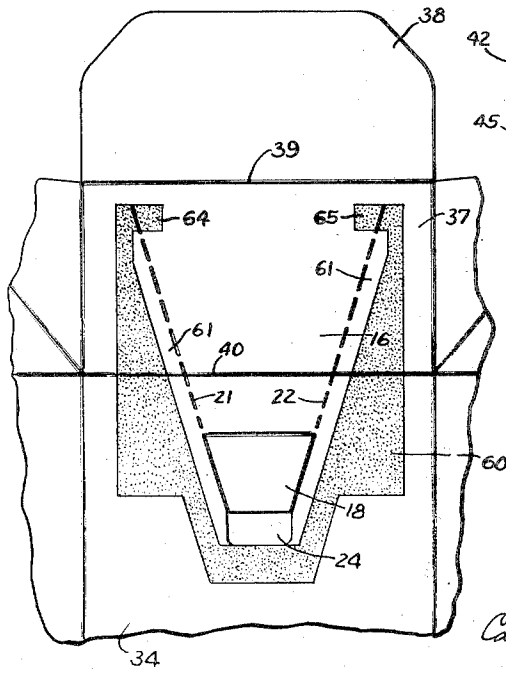
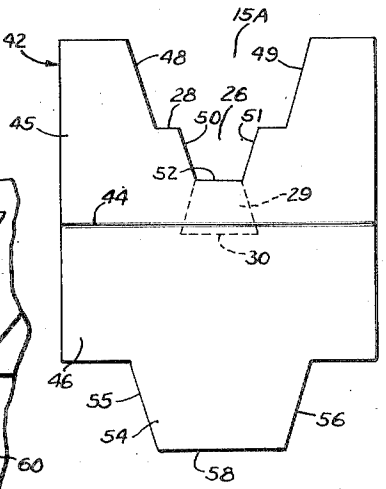


Fig. 7



INVENTOR.
Carroll R. Alden

BY
Carlson, Pitzner, Hubbard & Wolfe
Attys

United States Patent Office 2,763,424
Patented Sept. 18, 1956

2,763,424

PANEL STRUCTURE AND BLANK FOR CONTAINERS

Carroll R. Alden, Detroit, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich., a corporation of Michigan

Application February 4, 1952, Serial No. 269,785

10 Claims. (Cl. 229—17)

The present invention pertains in general to the packaging field. More specifically, the invention concerns a novel panel structure and blank for containers of bendable sheet material such as paperboard, finding particular but not exclusive utility in containers of the kind disclosed in my copending U. S. application Serial No. 266,572, filed January 15, 1952.

The general object of the present invention is to provide a panel structure and blank for containers of the character set forth above and adapted to improve their pouring characteristics while also rendering such containers susceptible of economical manufacture on a mass productive basis.

Another object is to provide a panel structure and blank of the foregoing type and having a pouring opening panel with an inside ply which may be constructed from web or ribbon stock on a mass productive basis without scrap loss, thereby conserving material and eliminating the need for apparatus to separate and dispose of scrap.

Other objects and advantages will become apparent from the following detailed description, taken together with the accompanying drawings, in which:

Figure 1 is a perspective view of an illustrative container embodying the present invention, such container being in an initially filled and sealed condition.

Fig. 2 is a fragmentary perspective view showing the container of Fig. 1 with its lift tab in raised position to expose the pouring opening prior to dispensing therefrom.

Fig. 3 is an enlarged fragmentary vertical sectional view taken through the illustrative container of Fig. 1 in the plane of the line 3—3, the thickness of the container stock being somewhat exaggerated for purposes of illustration.

Fig. 4 is an enlarged fragmentary vertical sectional view taken in the plane of the line 4—4 in Fig. 2 but showing the container in an inclined position for pouring purposes.

Fig. 5 is a fragmentary plan view showing the inside face of the cut and scored blank also embodying the invention and from which the container of Figs. 1 and 2 may be constructed.

Fig. 6 is an enlarged fragmentary vertical sectional view similar to Fig. 3 but showing the pouring opening panel and side panel structure in substantially coplanar position prior to erection of the container.

Fig. 7 is an enlarged plan view showing the inside face of the inner ply of the pouring opening panel utilized in the illustrative container of Figs. 1 and 2.

Fig. 8 is an enlarged fragmentary plan view detailing the area of adhesive juncture between the inner ply of the pouring opening panel and the outer ply of the blank shown in Fig. 5.

While the invention is susceptible of various modifications and alternative constructions, certain preferred embodiments have been shown in the drawings and will be described below in considerable detail. It should be understood, however, that there is no intention to limit the invention to the specific forms disclosed, but on the contrary, the intention is to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Referring in further detail to the drawings, an illustrative container **10** is shown in Figs. 1 and 2 having a panel structure and blank embodying the present invention. The container **10** may be fabricated from paperboard or other bendable sheet material and is self-sustaining in shape, being coated or impregnated with paraffin or some other suitable substance to make it moisture-proof and capable of holding liquids such as milk. The container **10** comprises a tubular body **11** of approximately square or rectangular cross-section and having a top end closure **12** surmounted by a central laminar rib **14**. Such a closure will, of course, be recognized by those skilled in the art as a "gable top." The body **11** also has a bottom end closure (not shown) of any suitable form, the details of which being of no immediate concern here. Included within the top end closure is a sanitarily protected pouring opening **15** initially covered by a lift tab **16**, the latter having an easily loosened gripping tongue **18** at its free end. The pouring opening **15** is located in an upper planar panel or pouring opening panel **19** normally situated above the filling line of the container. Fluid dispensed from the pouring opening **15** is adapted to travel past a lower planar or side panel **20**. The panels **19** and **20** each include a common inner and a common outer ply, such panels together defining an angular corner and inside faces subtending an arc which in this case exceeds 90 degrees.

The lift tab **16** lies in the outer ply of each of the panels **19**, **20**, its lateral edges being defined therein by means of a pair of downwardly converging severance or perforation lines **21**, **22**. These lines may be completely severed in the region of the gripping tongue **18** to facilitate easy opening of the container, the tongue **18** being initially held in place by means of the material with which the container stock is coated or impregnated. Ease of opening is also facilitated by providing a finger recess **24** in the outer ply of the panel **20** immediately below the tongue **18**. The face area of the inner ply of the panels **19**, **20** underlying the lift tab **16**, and exposed upon elevation of the same, defines a sanitary protective margin **25** about the pouring opening **15**. The ply of material defining the margin **25** also serves as a pouring weir adjacent the pouring opening **15**.

As more fully discussed in my copending application Serial No. 266,572, mentioned earlier herein, there are two primary factors affecting the pouring characteristics of containers of the type disclosed herein. The first factor is the velocity of the poured stream at the point of separation from the container. The greater this velocity, the greater the tendency of the pouring fluid to effect clean separation regardless of how large or how small the size of the stream may be. The other factor is the effect of gravity on the poured stream at the separation point as compared with the effect of the adhesion forces tending to make the liquid cling to the container. Where the gravity effect outweighs the adhesion effect, the poured fluid will tend to make a clean separation from the container, both at the initiation and at the conclusion of pouring.

In consonance with the foregoing factors, there has been developed a novel panel structure and blank for enhancing the satisfactory pouring characteristics of the container. As shown particularly in Figures 2, 3 and 4, the foregoing is accomplished by providing a notch **26** in the crest or sill **28** of the pouring weir and by

mounting a pouring lip **29** below the notch **26** so that it will be traversed by the stream of fluid dispensed therethrough. The pouring lip **29** is fixed to the pouring weir by means of its upstream portion and with its downstream portion terminating in a free separation edge **30**. The latter is normally spaced from the plane of the pouring opening panel **19** as well as the underlying side panel **20** when the lift tab **16** is in elevated position.

When the pouring lip **29** and the container **10** are in the position illustrated in Fig. 4, the stream of fluid dispensed from the pouring opening **15** will flow downwardly along the lip **29**, separating from the same at its free downstream edge **30**. Since the edge **30** is disposed in spaced relation with the pouring opening panel **19** and the adjacent underlying side panel **20**, there is no tendency for the poured fluid to wet the side panel **20** because to do so it would have to make an abrupt reversal of flow and move upwardly along the inclined rear face of the pouring lip. Such a possibility is further minimized due to the fact that the relatively deep notch **26** in the sill of the pouring weir tends to produce the highest possible velocity in the poured stream at the time it reaches the separation edge **30**, even at comparatively low rates of flow. Consequently, the container **10** is adapted to pour neatly at any desired rate without dribbling, also being capable of initiating and cutting off pouring with nicety and precision regardless of the dexterity with which the container may be handled.

Referring more specifically to the structure of the panels **19**, **20**, there is shown in Fig. 5 the inside face of a blank **31** from which the container **11** may readily be formed. The face of the blank **31** carries a pattern of score lines dividing it into a plurality of panels and areas which are utilized for the walls of the container **10** and the end closure parts of the same when erected. The lower portion of the blank **31** contains the bottom end closure parts, which may be of any appropriate form. The central and major area of the blank is scored to define therein container body side panel areas **32**, **33**, **34** and **35**, together with a glue flap **36**. The side panel area **34** constitutes the outer ply of the container body side panel **20**. The upper ends of the side panel areas **32**, **33**, **34**, **35** and **36** are bounded by a common, laterally extending score line **40** separating them from end panel areas and fractional end panel areas comprising the component parts of the top closure of the container **10**. The score line **40** also defines the angular corner along which the pouring opening panel **19** and the container side panel **20** are connected. Those areas of the blank situated above the score line **40** and worthy of note are the end panel area **37**, which forms the outer ply of the pouring opening panel **19**, and the panel area **38**, which constitutes the outer ply of the laminar rib **14** at the top of the container. The areas **37** and **38** are separated by a transverse score line **39**.

For the purpose of rendering the container **10** susceptible of economical manufacture on a mass productive basis, resort is had to a novel inner ply for the panels **19**, **20**. Referring in particular to Fig. 7, it will be perceived that such inner ply in this instance comprises a pouring opening patch **42** of paperboard or other suitable sheet material. The patch **42** has a somewhat U-shaped outer perimeter and its inside face has a score line **44** running transversely thereof. The score line **44** separates the patch into an upper region **45** which is included in the pouring opening panel **19** and a lower region **46** which is included in the side panel **20**. Thus when the patch **42** is mounted in place on the blank **31**, as shown in Figs. 1, 2 and 5, the score line **44** of the patch coincides substantially with the angular corner between the panels **19**, **20**.

Incised in the upper region **45** and extending from the top edge of the patch **42** toward the score line **44** is a relatively large notch **15A** of substantially truncated triangular or trapezoidal shape and which forms the pouring opening **15** of the container (Fig. 7). The notch **15A** has downwardly converging lateral edges **48**, **49** which terminate at the bottom edge **28**, the latter forming the sill of the pouring weir of the container. Also incised in the upper region **45** of the patch and extending from the bottom edge or sill **28** of the notch **15A** toward the score line **44** is the somewhat smaller notch **26** defining the relief in the sill **28** for pouring purposes. The notch **26** also has downwardly converging lateral edges **50**, **51** which terminate at a bottom edge **52**, giving the notch **26** a substantially trapezoidal shape generally similar to that of the notch **15A**. The patch stock initially bounded by the edges **28**, **50**, **51** and **52** is utilized to form the pouring lip **29**, being reversely folded about the edge **52** and against the outside face of the patch **42** so that its free edge **30** extends below the score line **44**. Extending from the bottom edge of the lower region **46** of the patch is a projection **54** which serves to stiffen the panel **20** in the region of the tongue **18** of the lift tab and also to mask off the finger hole **24**.

For the purpose of rendering the patch **42** susceptible of exceptionally economical manufacture on a mass productive basis, the patch is constructed so that it may be cut from a continuous ribbon or web of stock without scrap loss. In furtherance of such objective, the projection **54** is given a substantially trapezoidal or truncated triangular form complementary to that of the pouring opening notch **15A**, such projection having downwardly converging lateral edges **55**, **56** terminating in a bottom edge **58**. Thus, when the patches **42** are formed in a continuous procession, the area of the projection **54** bounded by these edges constitutes the stock removed from the adjacent patch in the procession to define its pouring opening notch **15A**. Any limitations on the depth of the pouring opening notch **15A** resulting from limitations on the length of the projection **54** incident to use of the path **42** in small capacity containers are well compensated for by the supplemental pouring area added by the notch **26**. Since the pouring lip **29** is complementary to the notch **26**, it will be appreciated that there is no scrap loss whatever involved in the manufacture of patches as just described.

Turning now to Figs. 5 and 8, it will be noted that the patch **42** is secured to the side and end panel areas **34**, **37** of the blank **31** by a substantially U-shaped adhesive juncture **60**. The latter may be formed by coating a selected area of the blank **31** or the patch **42**, or both, with a suitable adhesive. Such an adhesive may, for example, be of a type which responds to heat and pressure, becoming activated as the patch **42** is pressed into position against the inside face of the blank **31**. In this instance, the adhesive is applied selectively to the inside faces of the panel areas **34**, **37**. As shown in Figs. 5 and 8, the adhesive juncture **60** is for the most part confined to a region lying between the side and lower edges of the patch **42** and the area of the lift flap **16** and finger recess **24**.

In order to avoid the possibility of accidental adhesion of the lift tab **16** to the patch **42**, precluding elevation of the same without tearing or other difficulty, a safety margin **61** on either side of the lift tab is left clear of adhesive. Such margin extends along the severance lines **21**, **22** which define the lateral edges of the lift tab, also extending through the finger recess **24**. In addition to the margin **61**, an adhesive-free margin **62** may also be left along the side and lower edges of the patch **42**.

Near the top of the patch **42**, the ends **64**, **65** of the juncture **60** may be extended inwardly across the upper ends of the severance lines **21**, **22** and toward the pouring opening notch **15A** (see Figs. 5 and 8). This fixes the patch stock defining the upper end of the pouring opening notch flat against the panel area **37** of the pouring opening panel **19**. It also provides reinforcement for the hinged end of the lift tab **16**.

When the patch **42** is secured in place against the inside face of the blank **31**, as shown in Figs. 5 and 6, the

pouring lip 29 is sandwiched snugly between the lift tab 16 and the abutting face of the patch 42. While the thickness of the patch, lip, and blank stock is considerably exaggerated in Fig. 6 and the other sectional views for purposes of illustration, it should be borne in mind that these parts actually lie almost in the same plane with each other and that there is scarcely a perceptible bulge in the outer surface of the container due to the presence of the pouring lip 29. The separation edge 30 of the pouring lip 29 in this instance extends below the coincident score lines 40, 44. The rear face of the lip 29 abutting the patch is, of course, maintained so that it will not be bound down by adhesive or moistureproofing material, particularly in the region of its downstream or separation edge 30. As the blank 31 is erected into a finished container, the pouring lip 29 deforms from the flat condition shown in Fig. 6 to the fixed condition shown in Fig. 3. When the lift tab 16 is elevated, however, the natural resiliency of the pouring lip stock permits the lip 29 to spring into a substantially unflexed condition wherein the separation edge 30 is well clear of the exposed underlying portion of the patch face.

Although the inner ply of the pouring opening panel 19 is preferably fashioned as a separate patch, such as the patch 42 described above, it will be appreciated by those skilled in the art that this ply may also be made as an extra panel area integral with the main ply of the blank 31. Such an extension may have a height corresponding to that of the blank 42 and a width comparable to that of the panel areas 34, 37, being fixed to the latter by an adhesive juncture similar to the juncture 60.

I claim as my invention:

1. In a blank for a moistureproof paper container, the combination comprising a main ply having a side panel area and an end panel area connected thereto along a common transverse score line, a severable lift tab in said main ply and common to both said panel areas, an inner ply having an upper edge with a substantially trapezoidal pouring opening notch incised therein, a pouring lip incised in said inner ply adjacent said pouring opening notch and reversely bent so that its free edge extends beyond said common score line, said pouring lip being substantially similar in shape to the pouring opening notch, and a projection on said inner ply situated at the edge thereof remote from said pouring opening notch, said projection being substantially complementary in shape with said pouring opening notch prior to incision of said pouring lip, and an adhesive juncture between said inner ply and said panel areas, said inner ply being disposed with said pouring opening notch underlying said lift tab and with said pouring lip sandwiched between said lift tab and said inner ply but free of said adhesive juncture.

2. In a blank for a moistureproof paper container, the combination comprising a side panel area and an end panel area connected with each other along a common transverse score line, a severable lift tab common to both said panel areas, an inner ply bonded to said panel areas, said inner ply having a generally trapezoidal pouring opening notch adjacent one edge thereof, a pouring lip incised in said inner ply adjacent said pouring opening notch and reversely bent so that its free edge extends beyond said common score line, said pouring lip also having a general trapezoidal shape similar to that of the pouring opening notch, said inner ply being disposed with the trapezoidal pouring opening notch underlying said lift tab and with said trapezoidal pouring lip sandwiched between said lift tab and said inner ply.

3. In a blank for a moistureproof paper container, the combination comprising a main ply having a side panel area and an end panel area separated from each other by a common transverse score line, a severable lift tab in said main ply and common to both said panel areas, an inner ply bonded to said panel areas, said inner ply having a pouring opening notch adjacent one end thereof, a pouring lip incised in said inner ply adjacent said pouring opening notch and reversely bent so that its free edge extends beyond said common score line, said pouring lip being substantially similar in shape to the pouring opening notch, said inner ply being disposed with the pouring opening notch underlying said lift tab and with said pouring lip sandwiched between said lift tab and said inner ply.

4. In a blank for a moistureproof paper container, the combination comprising a main ply having a side panel area and an end panel area connected thereto along a common transverse score line, a lift tab common to both said panel areas and defined in said main ply by a pair of spaced apart severance lines and a finger recess, an inner ply having an upper edge with a substantially trapezoidal pouring opening notch incised therein, said notch having inwardly converging lateral edges, a pouring lip incised in said inner ply adjacent said pouring opening notch and reversely bent so that its free edge extends beyond said common score line, said pouring lip leaving in the inside edge of the pouring opening notch a generally trapezoidal notch also having inwardly converging lateral edges, and a substantially trapezoidal projection on said inner ply situated at the edge thereof remote from said pouring opening notch, said projection being complementary in shape with said pouring opening notch prior to incision of said pouring lip, and an adhesive juncture between said inner ply and said panel areas, said juncture being situated so as to leave an adhesive-free safety margin adjacent said lift tab severance lines and extending through said finger recess, said inner ply being disposed with said pouring opening notch underlying said lift tab and with said pouring lip sandwiched between said lift tab and said inner ply but free of said adhesive juncture.

5. In a blank for a fluid-tight paper container, the combination comprising a pouring opening ply having a pouring opening notch incised in the upper edge thereof, a pouring lip incised in said ply adjacent the inner edge of said notch, said pouring lip being similar in shape to said notch and reversely bent against the face of said ply, and a projection extending from the edge of said ply remote from said notch, said projection being complementary in shape to said notch.

6. In a blank for a fluid-tight paper container, the combination of a pouring opening ply having a generally trapezoidal pouring opening notch incised in the upper edge thereof, a substantially trapezoidal pouring lip incised in said ply adjacent the inner end of said notch, said pouring lip being reversely bent and terminating in a free separation edge, and a generally trapezoidal tongue extending from the lower edge of said ply, the shape of said tongue being complementary to that of said pouring opening notch.

7. In a blank for a container of paperboard or the like, a pouring opening patch comprising, in combination, a ply of sheet stock having a substantially trapezoidal recess adjacent one edge thereof, said ply having a transverse score line therein, a pouring lip also of substantially trapezoidal shape incised in said ply adjacent the inner edge of said recess, said pouring lip being reversely bent so that its free edge lies beyond said transverse score line with a notch left in the inside edge of said recess, and a projection located at the edge of said ply opposite said recess, said projection also being of substantially trapezoidal shape and complementary to said recess prior to formation of said notch.

8. A panel structure for moistureproof paper containers and blanks therefor, said panel structure comprising the combination of a main ply having a side panel area and an end panel area connected with each other along a common transverse score line, a severable lift tab common to both said panel areas, an inner ply bonded to said panel areas, said inner ply having a generally trapezoidal pouring opening notch adjacent one edge thereof

with inwardly converging lateral edges, a pouring lip incised in said inner ply adjacent said pouring opening notch and reversely bent so that its free edge extends beyond said common score line, said pouring lip also having a general trapezoidal shape similar to that of the pouring opening notch, a sanitarily protected marginal area adjacent said pouring opening notch and defining a pouring weir, said inner ply being disposed with said lift tab masking off said sanitarily protected area and said trapezoidal pouring lip.

9. A panel structure for paperboard containers and the blanks therefor, said structure comprising the combination of two adjacent planar panels separated from each other by a common score line, one being a container body side panel, the other said panel being a pouring opening panel, a pouring weir in said other panel having a substantially trapezoidal pouring opening with spaced apart lateral edges converging toward a sill, said sill having a relatively deep and substantially trapezoidal notch therein with spaced apart lateral edges converging toward a bottom edge, a pouring lip fixed to said other panel in proximity to said weir and adapted to be traversed by the flow of fluid over the latter, said pouring lip being defined by a reversely bent portion of said other panel incised to form said trapezoidal notch, and a free downstream edge on said pouring lip disposed in spaced relation with both said sidewall panel and said other panel.

10. A container panel structure of paperboard or the like and comprising, in combination, a pair of adjacent planar panels defined at least in part by an inner ply and an outer ply common to both, one said panel being a sidewall panel, the other said panel being a pouring opening panel with a generally trapezoidal pouring opening incised in the inner ply thereof, said pouring opening having upwardly diverging lateral edges, a pouring weir in said inner ply of said pouring opening panel, a relatively resilient pouring lip of generally trapezoidal form incised in the inner ply of said pouring opening panel and reversely bent so as to project its free edge into spaced relation with both said sidewall panel and said pouring opening panel, said pouring lip defining a generally trapezoidal notch in the sill of said pouring weir and said notch having upwardly diverging lateral edges, and a lift tab hinged to said outer ply of said pouring opening panel, said lift tab being initially disposed in overlying sanitarily protective relation with said pouring opening and said pouring lip.

References Cited in the file of this patent

UNITED STATES PATENTS

1,610,759	Downing	Dec. 14, 1926
2,218,670	Bennett	Oct. 22, 1940
2,263,957	Sooy	Nov. 25, 1941
2,531,630	Jones	Nov. 28, 1950