March 17, 1964 J. A. ZINN 3,125,274

BLANK FOR DOUBLE WALLED CARTON

Original Filed March 16, 1960

Fig. 1

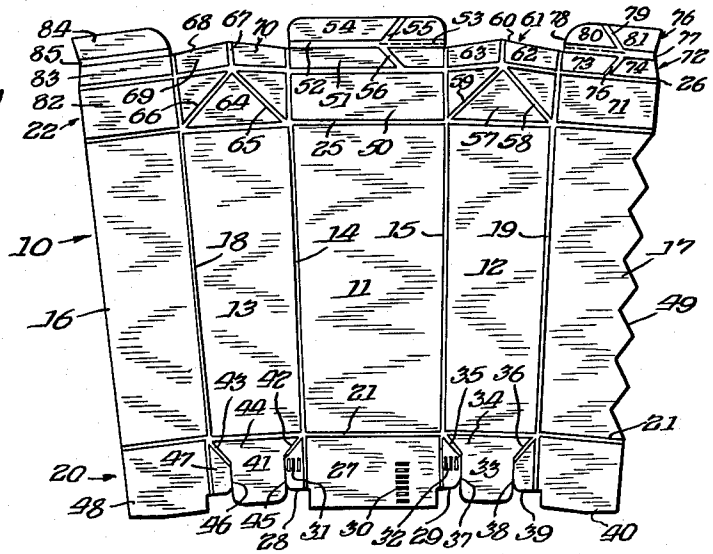


Fig. 2.

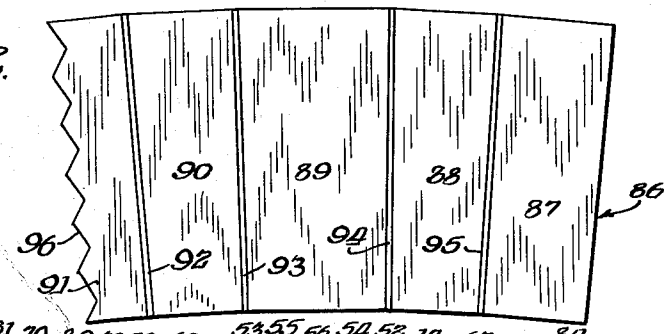
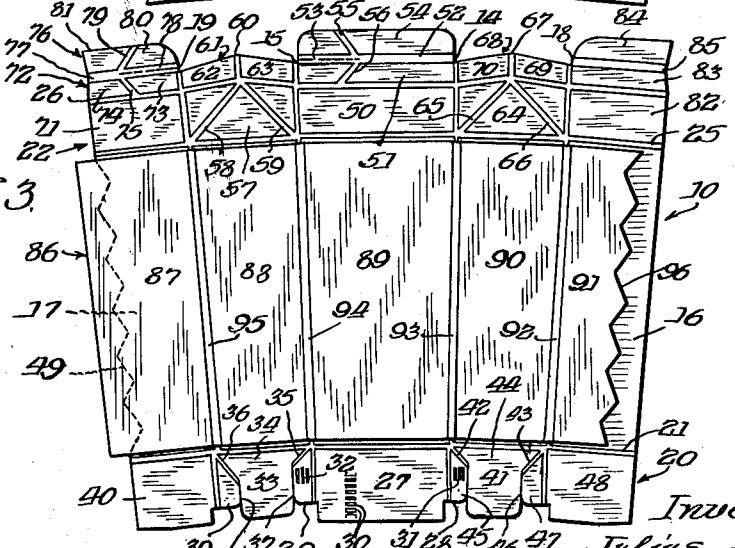


Fig. 3.



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BLANK FOR DOUBLE WALLED CARTON

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2 Claims. (Cl. 229—14)

My invention relates to a carton blank made of paper or the like having double side walls and is a division of my co-pending application Serial No. 15,224 filed March 16, 1960, and is intended for the production of cartons or containers for various use and purposes including milk and other liquid packages for transportation as units, and also, is designed for various kinds of frozen foods as well as powdered and desiccated substances of various types and kinds and may also be used for the packaging of small hardware materials such as nails, screws or the like.

Another and further object of my invention is the provision of a carton blank and a second blank secured thereto throughout the wall portion thereof so that the blank can be fashioned into a carton by folding the two blanks together so the carton is smoothly fashioned and possesses a double side walled thickness which will sustain a heavy load of fluid or other material without fracturing the walls or the bulging outward of the walls due to pressure of the liquid therein which would interfere with the proper packing and shipment of packages of this size and also in which the liner forms a breaker member over which the end portions of the carton can readily be folded.

Another and further object of my invention is the provision of a double walled carton blank in which one of the blanks is so fashioned that the grain of the paper extends transversely thereof while the other blank or liner therefor has the grain extending vertically of the blank, thus providing a double walled structure having the grain of the paper at right angles to each other in the double walls of the carton, thereby adding materially to the strength of the carton and enabling the carton to be more cheaply constructed. By combining the carton materials in this manner an exceedingly strong walled carton is provided which otherwise could only be accomplished through the use of exceedingly heavy material which would be difficult to work and to fashion into a proper structure.

These and other objects of my invention will be more fully and better understood by reference to the accompanying sheet of drawings and in which:

FIGURE 1 is an elevational view of the outer face of a carton blank for use as the outer wall of the carton;

FIGURE 2 is an elevational view of a reinforcing blank adapted to be fitted against the inner face of the blank shown in FIGURE 1 to produce a double walled carton structure; and

FIGURE 3 is an elevational view taken of the inner face of a carton blank in which the blank illustrated in FIGURE 1 is combined with the blank shown in FIGURE 2.

Referring now specifically to the drawings and in which like reference characters refer to like parts throughout, the outer shell of a carton blank designated as a whole as **10** is shown which consists of a front panel **11** and a pair of side panels **12** and **13** connected to the front

panel **11** by crease lines **14** and **15** extending vertically of the blank **10** on each side of the front panel **11**. A pair of narrow panels **16** and **17** are provided at each side of the blank **10** which are secured to the side panels **12** and **13** by crease lines **18** and **19** extending vertically of the blank **10**, the side panel **17** being serrated along its outer free edge for a double walled carton as hereinafter described, but should be straight for a single walled carton. When the blank **10** is folded into carton form the panels **16** and **17** overlap each other at their outer edges a sufficient amount to form a strong joint and are glued together thereby forming a rear panel having the same width and contour as the front panel **11** in the final assembly of the carton, and providing a seam which extends centrally of the carton throughout its entire length.

The lower end portion of the blank **10**, designated as a whole as **20**, is an extension of each of the panels hereinabove described and has a crease line **21** extending across the blank **20** and across the vertical crease lines **14**, **15**, **18** and **19** defining a plurality of flaps and tabs hereinafter described and which when folded inward in superimposed relation with each other along the crease line **21**, after the blank **10** has been folded along the vertical crease lines and glued together, forms the bottom of the carton.

An upper portion of the blank **10** designated as a whole as **22**, is provided and has a crease line **25** extending transversely of the blank **10** which also marks the division of extensions of the panels **11**, **12**, **13**, **16**, and **17** and forms a top closure for the carton when fashioned into form and also a pour spout for the carton after the carton has been opened for use. A second transverse crease line **26** extends across the blank **10** which is spaced outward from the crease line **25** and defines a plurality of tabs (hereinafter described) extending outward from the flaps defined by the crease line **25** and the vertical score lines **14**, **15**, **18** and **19** which form a portion of the top closure for the carton. The crease lines **21**, **25** and **26** are slightly curved with respect to a base line substantially horizontal to each of these crease lines as they cross the front panel **11** at its top and bottom because the panels **11**, **12**, **13**, **16**, and **17** as shown are slightly narrower at their lower ends than at their upper ends, thereby producing a carton which is slightly greater in cross-sectional area at its top than at the bottom and therefore the carton is slightly tapered for easy shipment and handling, although the panels may be straight sided if desired thereby producing a straight sided carton.

The vertical crease lines **14**, **15**, **18**, and **19** and the horizontal crease lines **21**, **25**, and **26** are secured by the use of scoring or crease rules applied edgewise to the outside surface of the blank **10** on selected lines over slots or shallow grooves in a die supporting the blank on its under side and applying pressure to the rules which results in narrow shallow crease lines being formed on the outer face of the blank **10** with corresponding very slight elevated ribs being formed on the inner face of the blank **10**. The blank **10** is thereafter folded inward to ultimate form by pressure applied to the outside of this blank thereby folding it around the ribs which produces sharp right outside angled corners on the carton with the inside corners being slightly rounded, in either a single or double walled structure, and therefore the fibers of the paper are not broken but compressed and

slightly deformed, thereby retaining the full tensile strength of the material, and producing neat appearing outside corners.

A flap **27** is formed at the lower end of the front panel **11** with sealing tabs **28** and **29** at each side of the flap **27** with the crease lines **14** and **15** extending between the flap **27** and sealing tabs **28** and **29**. A serrated area **30** is provided on the flap **27** with similar serrated areas **31** and **32** on the sealing tabs **28** and **29** respectively. The serrated areas **30**, **31** and **32** are formed by pressure dies having spaced teeth thereon with valleys therebetween preferably applied to the outer faces of the flap **27** and tabs **28** and **29** which deforms the flat surfaced blank of these areas into ribs and valleys which extend transversely of the flap **27** and longitudinally of the tabs **28** and **29**. The ribs and valleys of the area **30** overlie the outer edge of the flap **48** when it is folded over the flap **40** in the formation of the bottom of the carton, and the serrated areas **31** and **32** on the tabs **28** and **29** extend across and overlie the ends of the tabs **47** and **39** in the final formation of the carton. When the serrated areas **30**, **31** and **32** are formed, the tops of the ribs are slightly above the surface level of the flaps and tabs on both sides thereof with valleys between the ribs which form glue wells as the glue is applied to the inner face of the flap **27** and the tabs **28** and **29**. As the flap **227** is folded upon the faces of the overlapped flaps **48** and **40**, glue carried in the valleys of the area **30** is applied at the seam on the edge of the flap **48** and the flap **40** in a larger amount than elsewhere between the flaps **27** and **40** and **48**. The serrated areas **31** and **32** perform a like function over the ends of the tabs **47** and **39** respectively in the completed carton so that at these points some additional glue is provided which insures a tight and leakproof carton at these three points, thereby correcting and providing for a certainty that leakage at these particular points will not occur as has sometimes occurred in the past. In addition, the ribs are sealed to the surface which they engage, thereby assisting in the formation of a tight seal and providing dams which prevent transverse flow of any liquid which may seep out between the engaged faces of the sealed flaps and tabs.

A flap **33** is provided at the end of the side panel **12**, the flap **33** having a base portion **34** defined by diagonal crease lines **35** and **36** and slits **37** and **38** continuing from the ends of the crease lines **35** and **36** outward which separates the major portion of the flap **33** from the sealing tab **29** along one of its sides with sealing tab **39** being formed on the opposite side of the flap **33** and connected by the crease line **19** to a flap **40** on the end of the panel **17**, which flap **40** when the blank **10** is fashioned into a carton forms a part of the bottom of the completed carton.

A flap **41** is provided on the lower end of the panel **13** and is defined by a crease line **21** and short angularly extending crease lines **42** and **43** on each side of the base portion **44** of the flap **41** with severance lines **45** and **46** at each of its sides which separate the major portion of the flap **41** from the sealing tab **28** and from a sealing tab **47** on the side of a flap **48** formed as an extension of the panel **16** and defined by the crease lines **18**, **21** and **43** and is severed from the major portion of the flap **41** on the severance line **46** both of which flaps **41** and **48** form a part of the bottom of the assembled carton.

The panel **17** is provided with a serrated edge **49** for engagement with the serrated edge of the liner as hereinafter described, and is underlapped against the inside face of a portion of the panel **16** to form a back panel for the carton of a width equal to the front panel **11** as hereinafter described.

The top **22** of the blank **10** above the crease line **25** has a plurality of extensions thereon which when folded on the crease lines hereinafter described forms a closure for the top of the carton and when broken and parts of the extensions rearranged, forms a pouring spout for the contents of the carton.

A flap **50** is formed as an extension of the front panel **11** as defined by the cross crease line **25** and the vertical crease lines **14** and **15** and has a portion **51** thereon defined by the crease line **26** and a second crease line **52** which is perforated partially of its length at **53** to form a tear line with a tab **54** at the outer side of the portion **51** defined by the crease line **52** with a diagonal crease line **55** thereacross with a short diagonal crease line **56** extending across the portion **51**.

A flap **57** is provided which is an extension of the side panel **12** and is defined by the crease lines **15** and **19** at each of its sides and has crease lines **58** and **59** therein extending diagonally partially thereacross which intersect each other at the crease line **26** and merge into a straight crease line **60** extending across a tab **61**, which separates the tab **61** into two sections **62** and **63** respectively. A flap **64** is formed as an extension of the side panel **13** and is defined by the horizontal crease line **25** and the vertical crease lines **14** and **18** and has two diagonal crease lines **65** and **66** extending from the lower outside corners of the flap **64** inwardly and upwardly to the crease line **26** and to a vertical crease line **67** extending across a flap **68** dividing the flap **68** into two sections **69** and **70**.

A flap **71** is formed at the upper end of the panel **17** and is defined by the vertical crease line **19** and the free edge of the panel **17** and has the crease line **26** extending across the flap **71** with a portion **72** at the outer side thereof divided into two sections **73** and **74** by a short crease line **75** and having a tab **76** on its outer edge connected with the portion **72** by a crease line **77** which is perforated at **78** for a portion of its length to form a tear line when the closed and sealed carton is opened. A diagonal crease line **79** extends across the tab **76** and to the crease line **77** which divides the tab **76** into two sections **80** and **81**. A flap **82** is formed at the end of the panel **16** which is defined by the crease lines **18** and **25** with a section **83** thereon defined by the crease lines **26** and **18** and having a tab **84** thereon defined by a crease line **85**.

The blank **10** as hereinabove described with a straight side to the panel **17** instead of a serrated one, when folded and the bottom portions fitted together forms a single walled carton open at the top and ready to be filled. After the carton is filled the top portion **22** is folded and sealed, or stapled, and the filled carton is ready for shipping.

A liner, designated as a whole as **86**, is provided which is applied to the inner face of the blank **10** as shown in FIGURE 3 and has a serrated edge **96** at one side thereof as it is being laminated or glued to the blank **10** by the usual blank laminating or strip laying machine, as shown in FIGURE 3 where the liner **86** is shown fitted against the inner surface of the blank **10**, with the liner **86** being reversed as shown in FIGURES 1 and 2.

The liner **86** is made with the grain of the paper extending in a vertical direction thereby crossing the grain of the paper from which the outer blank **10** is made at a right angle, thereby increasing the strength of the side walls of the carton and providing a carton which may be made in gallon sizes if desired for marketing ordinary liquids such as milk, and in small sizes for other liquids heavier than water, or other ordinary liquids as well as metal articles. The bottom and top construction is sufficiently strong to support the load of a large sized container such as a gallon or half gallon size.

The liner **86** is composed of a plurality of panels **87**, **88**, **89**, **90**, and **91** with crease lines **92**, **93**, **94**, and **95** with the free edge **96** of the line **86** being serrated to match the serrated edge **49** of the blank **10**, which serrated edges are fitted together when the carton blanks are fashioned into a carton. The panels **87**, **88**, **89**, **90** and **91** terminate just short of the fold lines **21** and **25** of the blank **10** and are therefore very slightly shorter than are the corresponding panels **11**, **12**, **13**, **16**, and **17** to permit the flaps at the top and bottom of the blank

10 to be folded inwardly over the ends of the liner 86 in the production of a carton.

The crease lines 92 to 95 inclusive on the liner 86 are produced in the same fashion as are the crease lines on the blank 10 except that they are produced with a rule having a slightly greater thickness. If a No. 2 rule is used on the blank 10, then a No. 3 rule would be proper for use on the liner 86. The rules are applied to the outer face of the liner 86 and produce a very slight depressed line area on the outside of the blank with a very slightly elevated rib on the inside surface. When the liner 86 and the blank 10 are secured together the inner face of the blank 10 is placed against the outer face of the liner 86 with the ribs along the crease lines in the blank fitted into the depressed lines in the liner, with the top edge of the liner being in register with the crease line 25 in the blank 10, and the bottom of the liner 86 is in register with the crease line 21, thereby producing a breaker over which the bottom portion 20 and the top portion 22 of the blank 10 is folded during the completion of the carton and the closing of the filled carton. In this position the blank 10 and the liner 86 are firmly laminated or glued to each other by the usual blank or strip laying machine thereby forming a unitary structure.

In fashioning the double walled carton, the combined blank and liner are folded around the rectangular shaped mandrel with the combined panel 17 having a serrated edge 49 and lower panel 87 being first folded against the face of the mandrel and thereafter the combined panel 16 and liner panel 91 are placed in position around the mandrel with the serrated edge 96 of the panel 91 overlaying the outer face of the edge portion of the panel 87 of the liner with the serrated edge 49 of the panel 17 interfitted into the serrated edge 96 and the free edge portion of the panel 16 overlaying the joined serrated edges 49 and 96 and also in surface engagement with the edge portion of the panel 17 and glued thereto and also glueing the serrated portions together with fairly heavy pressure to form a strong joint and a panel of the same width and contour of the front panel 11 of the carton. The interlocking of the serrated edges produces a saw-toothed design which provides rigidity to the seam, also provides a staggered or offset seam because both liner and the carton body are sealed together along an offset line. The fitting together of the two serrated edges insures proper registration in the body seaming operation and prevents creeping of the seam in either direction and insures good folding of the bottom flaps in the fashioning of the carton and of the bellows top when the carton is closed after filling.

The carton, which may be either single or double side walled, is preferably formed in inverted position about the mandrel with the small end of the mandrel being in register with the transverse crease line 21. A bottom flap is formed by the overlapped outer edge portion of the flap 48 over the outer edge portion of the flap 40 which is thereupon folded inward against the lower end of the mandrel, which brings the inside faces of the tabs 39 and 47 against the inside faces of the bases 34 and 44 of the flaps 33 and 41 to which glue has been applied and these parts are sealed together. Glue has also been applied to the inside faces to the tabs 28 and 29 and to the serrated portions 31 and 32 of these tabs and to the inside face of the flap 27 including the serrated area 30, of the flap 27. The flap 27 including the tabs 28 and 29 is thereupon folded inwardly over a portion of the outer surface of the face of the combined flaps 40 and 48 and these surfaces sealed together by pressure and at the same time the tabs 28 and 29 are sealed to the inside faces of the bases 34 and 44 and to the outer faces of the ends of the tabs 39 and 47 which they overlie. As hereinabove explained, the serrated area 30 overlies the junction of the flaps 40 and 48 and insures an abundance of glue at this point, with the same condition existing between the tabs 29 and 39 and 28 and 47, thereby insuring against possible leakage at these three points in the finished carton. After the folding and sealing as above described the flaps 33 and 41 are folded inward towards each other along with the sealed tabs 29, 39 28, and 47 along the crease line 21 and against the outer side of the flap 27 and glued thereto, thus completely sealing the carton at its lower end.

When the carton is completed as above described, it is ready for filling which is usually accomplished by some form of filling apparatus which measures and dispenses a sufficient quantity of material to fill a particular size carton. When the carton is filled and ready to be closed, the two top flaps 50 and the combined flaps 71 and 82 are folded inwardly bringing the portions 51 and 72 and 83 into face-to-face relation with each other, which action also folds the flaps 57 and 64 inwardly along the crease line 25 which also folds these flaps 57 and 64 on the diagonal crease lines defining substantially three generally triangular areas of each fold and also on the short vertical crease lines 60 and 67 while the portions 62 and 63 and 69 and 70 are in folded face-to-face relation with each other in which position the combined sections 76 and 84 are tucked in between the inner faces of the sections 63 and 70 and the inner face of the portion 51 and the extension 54 folded thereover and stapled or glued in position thus effectively sealing the carton.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit or scope of the invention.

What is claimed is:

1. A flat carton blank of thin foldable material having a front panel portion, side panel portions and rear wall portions of the same width as the front panel when in partially overlapped relation with each other, the said panel portions being defined by vertical crease lines extending the width of the blank and having a top and bottom crease line extending the length of the blank and crossing the vertical crease lines defining a plurality of foldable flaps at the top of the blank to form a bellows closure for the carton and also defining a plurality of flaps to form a bottom for the carton integral with the front and rear panels and the said side panels, and a liner for the body portion of the carton having crease lines thereacross extending from top to bottom defining some panels comparable to the panels of the carton blank with the outer panels of the liner being narrower at one side and wider on the opposite edge than are the comparable carton panels the edge of the narrow panel of the liner being adapted to abut the edge of one rear wall portion of the carton with the other rear wall portion of the carton being adapted to overlie the meeting edges of the liner and carton, the crease lines being indented from the outer sides of the carton blank with ribs formed on the inner faces with the ribs on the carton blank being placed in register with the crease lines on the liner, with the crease lines on the liner being slightly wider than the ribs on the carton blank.

2. A carton blank for a rectangular carton of thin foldable material, consisting of an outer casing and an inner lining for the wall portions thereof, the outer casing having a front panel portion, side panel portions, and rear wall portions adapted to be folded in overlapped relation with each other to form a rear panel of the same as the front panel, one of said portions having dovetailed serrations at one of its sides, the panels being defined by crease lines extending from top to bottom of the blank said crease lines defining channels on the inner face of the outer casing and transverse fold lines spaced from the top and bottom of the blank to define a bellows top for the blank and bottom tabs and flaps for the bottom of

the carton, the inner liner comprising a front portion, side panel sections, and rear wall portions, one of said rear wall portions having dovetailed side edges, each of said portions being defined by score lines having channels on the inner side and ribs on the outer side, and adapted to be fitted against the inner face of the outer casing with the ribs fitted into the channels in the inner face of the outer section, with its edges being out of register with the side edges of the outer casing and adapted to be interfolded with the outer section with the dovetailed portions of the outer section and inner lining interfitted together in abutting engagement with each other with one of the rear

wall portions overlapping the meeting joint of the said dovetailed portions and one of the edge panels of the liner in underlapping the said dovetailed joint.

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