(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 089 033**
A1

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: 83102432.8

(51) Int. Cl.³: **B 65 D 5/06**

(22) Date of filing: 11.03.83

(30) Priority: 12.03.82 US 357452

(43) Date of publication of application:
21.09.83 Bulletin 83/38

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI NL SE

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(54) **Container with raw edge protection.**

(57) A container bottom for a paperboard container of otherwise conventional construction, such as a thermoplastic coated paperboard container of the gable-top type. The specific improvement is defined by making the usual folded over tab which inhibits wicking of a trapezoidal shape (50), instead of a rectangular shape. The trapezoidal shape (50) yields a bottom construction (26) with less chance of raw edge (54a) and (56a) wicking. The trapezoidal shape of the tab (50), further, yields decreased abruptness in layer thickness transition in passing across the bottom of the container.

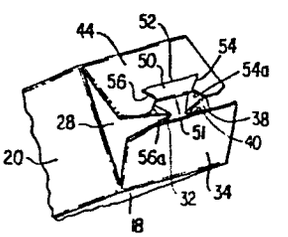

FIG. 2

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This invention relates to a paperboard container of the type having at least its interior surface coated with a thermoplastic resin, as for example, the common gable-top cartons currently employed for the packaging of liquid foodstuffs such as milk, orange juice and the like.

The prior art is aware of a great variety of constructions for such containers, particularly constructions which employ a single blank which is preformed by scoring, suitably folded by automatic machinery, and subsequently sealed by the application of heat and pressure during the filling and closing process. Such cartons enjoy wide use and are staple items of commerce.

One problem associated with paperboard containers of this type has been the occurrence of edge wicking at the free edge of one of the four main panel extension flaps of the blank which form the bottom closure for the container. The bottoms of such cartons often include a pair of oppositely disposed triangular portions having their apices pointing toward each other, such triangular portions defined by score lines in an opposed pair of extension flaps. The free edge of one of the remaining two bottom extension flaps is received within a mouth formed from the other of the two extension flaps. The first of these two extension flaps exhibits a raw edge (being a portion of the free edge of a bottom extension flap) which results in wicking of the liquid within the container, which consequent diminution of volume of liquid delivered to the ultimate purchaser and also undesirable contamination of the liquid by the paperboard material.

According to one known solution (see U. S. Patent 3,412,922), the problem of wicking at the free edge of one of the four bottom extension flaps is dealt with by formation

of a tab integral with that extension flap which is received by the mouth of an opposite extension flap. The tab is formed by cutting a pair of slots at right angles to the free edge of one of the extension tabs, to thereby define a rectangular tab integral with the extension flap from which it is formed. This tab is folded back on one surface of the bottom extension flap from which it is formed. After such folding, a tab recess is naturally formed in the tab extension flap. Upon the completion of the bottom folding and sealing process, that portion of the edge of the extension flap now presented to the interior of the container no longer possess a raw edge, rather a folded edge which is smooth and through which liquid will not penetrate.

However, in this known construction, a pair of raw edges (which are defined by the tab recess) are rather close to the edges of the overlying triangular flaps. This closeness requires uniformity in the application of heat and pressure to correctly form and seal the bottom of the container.

Further, in passing from one side of the container to its opposite side, in a direction parallel to the long axis of the integral tab, the change in number of layers of paperboard is from four layers to three layers to one layer to three layers to four layers, as counted along an imaginary axis coincident with the free end of the bottom extension flap which contains the integral tab. By virtue of the practice of this invention, certain of these transition distances are redistributed, so as to thereby effect a less abrupt transition zone. By the practice of this invention, the above-mentioned raw edge corners of the tab recess are cut back, to thereby yield a greater sealing area or dimension

between raw edge portions of the tab recess and the edge of triangular flaps which overlie and protect the raw tab recess edges from liquid contact.

IN THE DRAWINGS

Figure 1 is a plan view of a typical blank for a container of the gable-top type, as provided with the novel integral tab of this invention.

Figure 2 is a view illustrating an intermediate stage in the folding of the carton to form a completed bottom.

Figure 3 is a view looking into the bottom of the completed container, from the interior, with one of the two triangular flaps of the bottom being lifted for the purpose of illustrating the novel tab construction, with the other of the two triangular bottom flaps shown in its final position.

Referring now to the drawings, the numeral 10 denotes generally a single blank from which a paperboard container of the gable-top type is formed and for which this invention is particularly adapted. The container is made from paperboard having polyethylene coating on at least one, but preferably both sides thereof, although other suitable heat-sealable thermoplastic coatings may be employed as well. In addition, other materials such as aluminum foil and/or SURLYN may be employed as layers between the paperboard and one of the polyethylene coatings to better protect certain materials packaged within the container. It will be understood that the bottom construction described and claimed herein may be employed with any type of container of similar construction, no matter what the precise top closure configuration. The numeral 24 denotes generally four top

extension flaps of blank 10, the top panels being scored as indicated and adapted to form a conventional gable top. The precise form and scoring of the top extension flaps which defined top flap array 24 are not significant for the practice of this invention. The blank 10 is defined by main body panel elements 14, 16, 18 and 20, each being of generally rectangular configuration and adapted to form the four sides of the container. One of the endmost panels, here panel 20, is integrally provided with the usual manufacturer's flap 22.

The numeral 26 denotes a plurality of extension flaps which, when suitable and conventionally folded, form the bottom of the carton. Extension flap 28 is integral with body panel 16 and is provided with the usual score lines. Extension flap 34 is integral with body panel 18 and also with extension flap 28. Extension flap 38 is integral with body panel 16 and also with extension flap 34. Extension flap 44 is integral with panel 13 and also with panel 38. When folded, flaps 28 and 38 are opposed, while flaps 34 and 44 are also opposed. Flap 28 is provided with fold lines which define bellows panel members 30 and 32, similarly, flap 38 is provided with fold lines which define bellows panel members 40 and 42. As illustrated in Figure 2, bellows panel members 32 and 40 define a mouth, which in cooperation with bottom extension flap 34, receives the free edge 45 of extension flap 44. The configuration of the score lines in panels 28 and 38 and the manner of folding, as illustrated in Figure 2, are conventional.

For the purpose of inhibiting wicking at the raw edge of the central portion of the free end 45 of extension flap 44, extension flap 44 is provided with a tab 50 defined by spaced cut lines 54a and 56a. Integral tab 50 is folded back upon extension flap 44, as illustrated at

Figure 2, with the shape of tab 50 being trapezoidal. The longer parallel side of the tab is denoted by the numeral 52, with the short side being denoted by the numeral 51. The two non-parallel sides of trapezoidal tab 50 are denoted by the numerals 54 and 56.

In the final assembly of the bottom of the carton, as indicated at Figure 2, the flaps 44 and 34 are pushed towards each other, each pivoting about its integral connection with its respective body panel, with the free edge 45 of the extension flap 44 entering the above-described mouth associated with flap 34. This motion continues, with the free end 36 of extension flap 34 overlying and passing beyond the long edge 52 of integral tab 50. Finally, extension flaps 34 and 44 are substantially at right angles to the longitudinal axis of the carton, i.e., the longitudinal axes of the body panels 14, 16, 18 and 20.

Extension flaps 34 and 44 lie in parallel planes, and are separated substantially by their thickness. The final, closed position of the bottom is partially illustrated at Figure 3. Looking inside the container, towards the bottom, a portion of extension flap 28 is seen as in the form of an isosceles triangle, with its free end apex 28a facing the corresponding free end apex 38a of a corresponding triangular surface defined by extension flap 38. Again viewing Figure 3, the double paperboard layer thickness defined by the main portion of extension flap 28 and bellows panel portions 30 and 32 overlies extension flaps 34 and 44, with extension flap 34 being the outermost (container exterior) of the completed bottom extension flap assembly. In Figure 3, the isosceles triangle defined by extension flap 38 is shown as partially lifted to enable the reader to see, in solid line, a portion of tab edge 51 and raw edge cut 56a of the tab recess and a small portion of free end 45 of

extension flap 44. The reader will understand that the final bottom configuration would be reached if one were to push panel/isosceles triangle 38 down in Figure 3 from the position shown so that it attains a position coplaner with panel 28 and apply heat and pressure to bond the several paperboard layers together. Edge 51 of integral tab 50 is positioned slightly upwardly laterally of the oppositely facing apices 28a and 38a, this being indicated at Figure 3 by the non-coincidence of the tip 28a of extension flap 28 with edge 51.

Again referring to Figure 3, the reader will observe that the longest tab recess distance, denoted by D, is greater than the corresponding distance in the prior art. The numeral 100 denotes, in dashed lines, one of the corresponding edges of the corresponding tab recess in the prior art construction. It is seen that the distance between this edge and the nearest edge of the triangular flap 28 is less than the distance encountered in the present construction. This greater distance accordingly yields a greater area of adhesion between the triangular flaps 28, 38 and extension flaps 34, 44 proximate to the raw edges 54a and 56a of the tab recess. This greater area of adhesion affords a lesser probability, as for example may be due to manufacturing imperfections, of wicking of the raw edge portions 54a and 56a. Yet another advantage obtained by the practice of this invention is the lesser abruptness of transition of bottom wall thickness, from four to three to one to three to four paperboard layers, in transversing the container bottom (Figure 3) from left to right just above edge 51, in a plane substantially coincident with the plane of the bottom of the completed container, i.e., the plane of the paper. This follows from the greater distance from raw recess edges 54a and 56a to proximate edges of isosceles triangular flap portions 28 and 38, i.e., a redistribution

of thickness transition. Such thickness transition redistribution also places less demand on fine tolerances of automatic machinery used to set up and assemble the container.

WHAT IS CLAIMED IS:

1. A container of paperboard or the like, the container being formed from a single blank, the container having four body panels, a top closure, and a bottom closure, the bottom closure formed by two opposed pairs of integral extension flaps of said four body panels, a first opposed pair of flaps provided with score lines, one extension flap of the other pair of opposed extension flaps forming a mouth for the reception of the free end of its opposite flap, the said received flap end having an integral tab defined by spaced cut lines in its free end, said tab being bent back upon the container outer side of the flap from which it is formed, so as to define a tab sealing edge which is exposed to a product within the container, the major length of said tab sealing edge sandwiched between (1) a portion of that bottom extension flap which forms a mouth and (2) the apical portions of opposed triangular flaps formed from said first pair of opposed bottom extension flaps provided with score lines, the said integral tab defining a three-sided tab recess in the extension flap out of which it is formed, said tab recess having a mouth and sides on and adjacent said tab extension flap free end, the improvement comprising said integral tab being trapezoidal with the shorter parallel edge thereof being integrally joined to said extension flap out of which it is formed, and defining said tab sealing edge, the shorter sides of the trapezoidal tab each being parallel to an inwardly extending side of that triangular flap which overlies it, whereby the possibility of wicking at the two shorter side raw edges of the tab recess is reduced by increasing the distance of the raw edges from the

inwardly extending sides of the triangular flaps which overlie them, and whereby the transition in number of paperboard layers from four to three to one to three to four, along the free edge of the extension flap which contains the tab, is lengthened to thereby yield a lesser abruptness in and a redistribution of transition thickness.

2. The container of claim 1 wherein the paperboard blank is coated on at least one surface with a thermoplastic material which functions as an adhesive upon the application of heat and pressure, said at least one surface being the interior of the container.

3. The container of claims 1 or 2 wherein said tab sealing edge of said tab is displaced from the opposed apical portions of the said opposed triangular flaps.

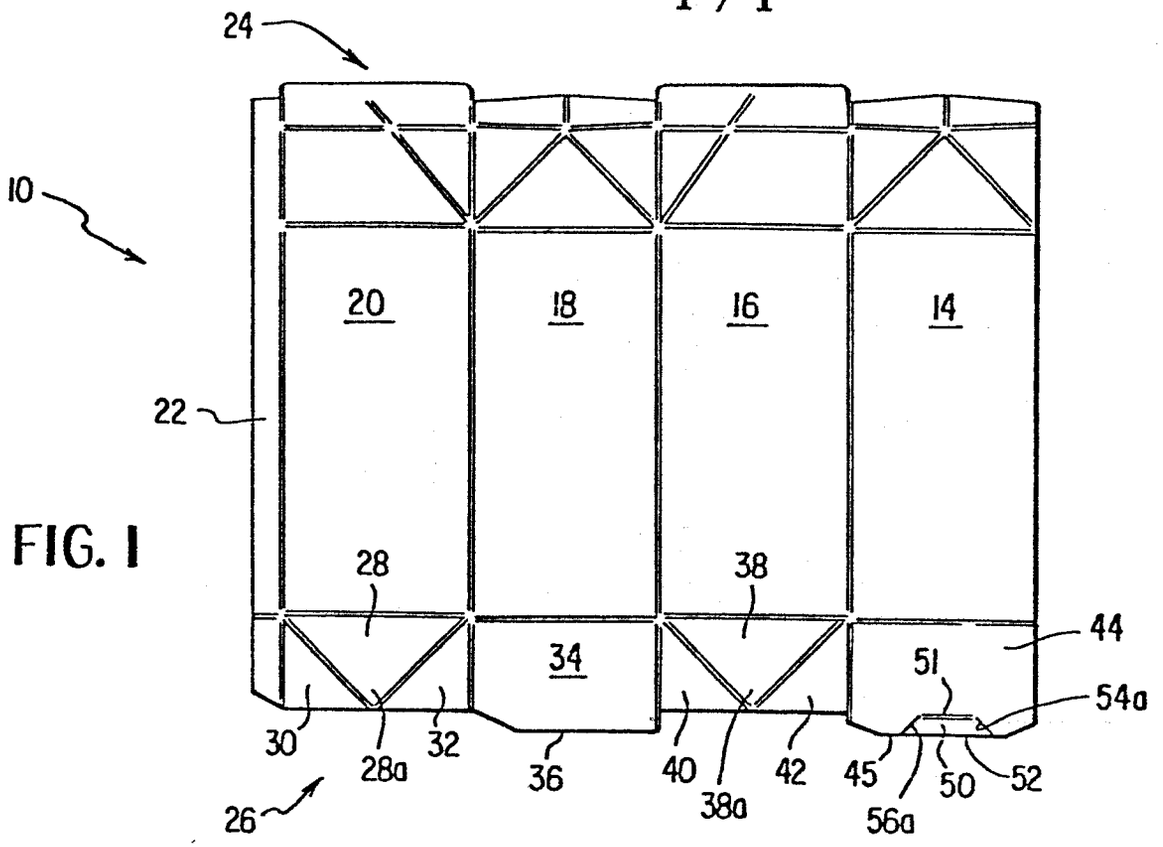

FIG. 1

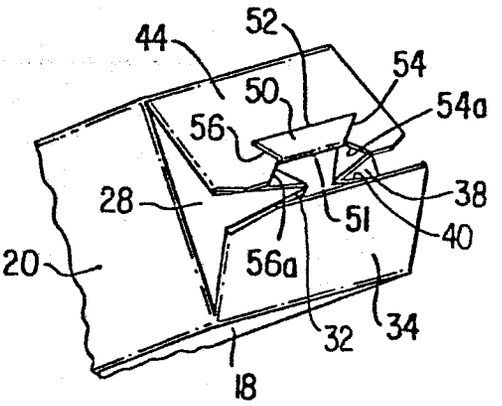

FIG. 2

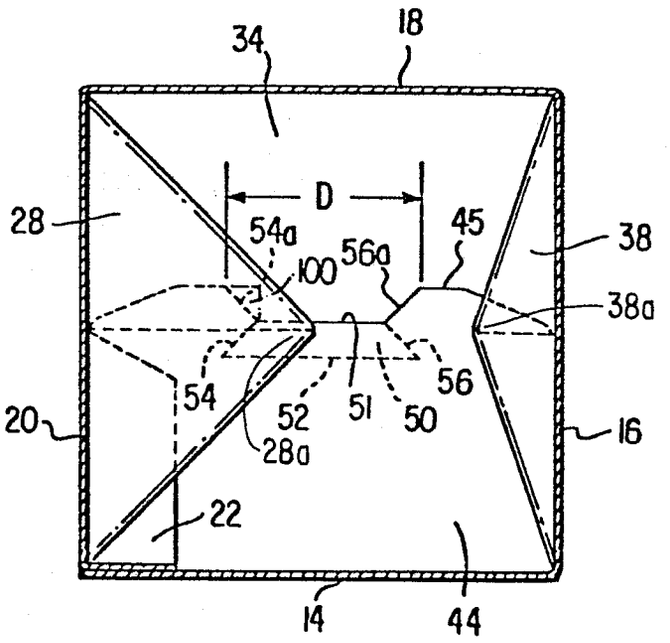

FIG. 3

European Patent Office

EUROPEAN SEARCH REPORT

0089033
Application number

EP 83 10 2432

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	US-A-3 913 825 (BROWNLEE et al.) * Figure 11; column 8, lines 1-3; column 9, lines 33-47 *	1-3	B 65 D 5/06
X	US-A-3 913 826 (BROWNLEE et al.) * Figure 7; column 1, lines 30-33, 50-54; column 8, lines 50-68 *	1-3	
A	US-A-4 192 446 (NAITO) * Figure 5; column 1, lines 11-14; column 4, lines 7-14 *	1-3	
A	GB-A-1 163 707 (EX-CELL-O CORP.) * Figures 1-4; page 1, lines 11-17, 50-56; page 2, lines 46-65, 115-119 *	1-3	TECHNICAL FIELDS SEARCHED (Int. Cl. ³) B 65 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20-06-1983	STEEGMAN R.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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