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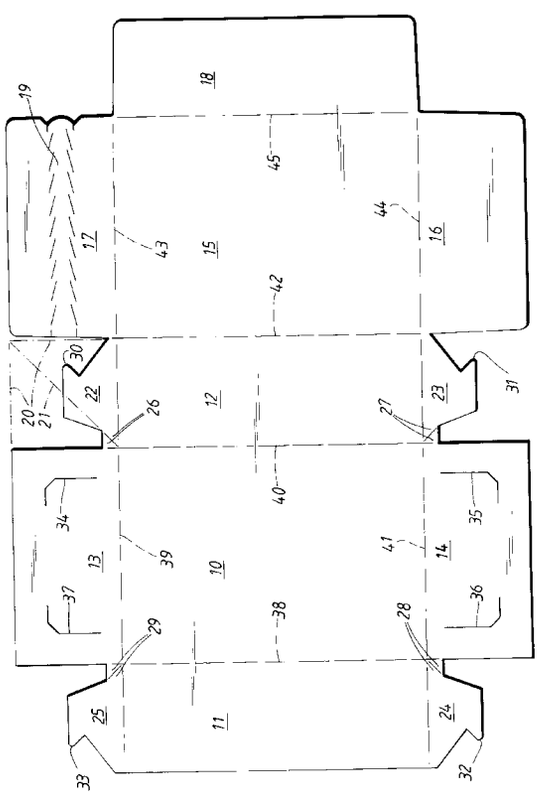
(54) Package made of cardboard or other foldable material.

(57) A package intended primarily for packaging of block-shaped frozen food products is disclosed which is formed from a blank of cardboard or other foldable material. The blank comprises a bottom panel (10), opposite pairs of side wall panels (11, 12 ; 13, 14) integral with said bottom panel and foldable along creasing lines (38-41), and delta flap type of attachable flaps (22, 23, 24, 25) extending between adjacent side wall panels for maintaining said blank in an erected state after folding said side wall panels along said creasing lines. According to the invention, each delta type flap comprises a double delta flap (26, 27, 28, 29) substantially in the form of two congruent right angle triangles located immediately adjacent each corner of the bottom panel (10), said double delta flap having a height less than the height of said adjacent side wall panels.



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The present invention relates to a package of cardboard or other foldable material according to the preamble of claim 1. Such a package is intended primarily, though not exclusively, for packaging of block-shaped frozen food products.

There are basically two different types of package structures which are suitable for packaging block-shaped frozen products. One of these structures is in the form of a package where the product to be packed is inserted into a pre-glued and erected package of the folding box type through one end of the folding box. This represents the technique identified as end-loading technique. The other procedure involves the use of a larger opening for placing the product into the package. The term within the art is top-loading, which means that an opening corresponding to a broad side of a package blank is used for the insertion of the product.

The present invention relates to a package of the top-loading type which is especially well suited for deep frozen products, for instance strawberries, cloudberries, etc.

The packaging line used for this type of packing comprises an endless conveyor along which a package blank is transported which has been partially erected to form a tray-shaped bottom. A top part of the blank is unfolded to an open position to expose an opening corresponding to the broad side area of the blank. The terms "bottom" and "top" relate to the orientation of the thus erected package with respect to the filling procedure.

There are several commercially available lines and systems for top loading of products into blanks which are automatically erected and transported through various processing systems including a filling station and sealing station.

Whilst the type of package referred to above is top-loaded with the product, access to the contents of the package by the consumer need not necessarily be via the "top". Instead, the end flaps of the broad side panels are frequently formed with tearing denotations for tearing up the folded down top panel inside a line where the top panel is sealed to the tray part of the package.

The procedure on a packaging line of the present type involves a timed cycle of steps allowing an overall processing speed of up to around 60 packages per minute. When deep frozen products are processed on the packaging line, there will inevitably be some heat transfer to the product from the environment which is normally at a temperature of around 20°C. The deep frozen product in block-shaped form is placed onto the plastic coated broadside of the blank forming a "tray bottom" during the processing on the packaging line. The ambient temperature causes a certain flow of melt water which is especially noticeable at the end corners of the filled and sealed package when it is removed from the packaging line.

This problem is not too significant when using packaging blanks having the traditional type of double delta corner flaps. The use of traditional double delta corner flaps, however, requires additional machinery and operation steps for erecting the blank. Normally several so called hot-melt guns are used for attaching the double folded flap to the outside of a side wall and frequently also for maintaining the flap double-folded. The use of double sided plastic coated blanks may in certain cases eliminate the need for hot-melt as a binding agent, but in those cases some sort of contact heat transfer is necessitated. Since in such cases heat must be transferred through several layers of material, a relatively complex system is required. Other types of sealing techniques such as high frequency welding, induction welding and hot air sealing are normally too expensive for this type of packaging line.

In order to eliminate the drawbacks of prior art packages, the present invention provides a package formed from a blank of cardboard or other foldable material, comprising a bottom panel, opposite pairs of side wall panels integral with said bottom panel and foldable along creasing lines, and delta flap type of attachment flaps arranged between adjacent side wall panels for maintaining said blank in an erected state after folding said side wall panels along said creasing lines.

The invention is characterized in that each delta type flap comprises a double delta flap substantially in the form of two congruent right angle triangles located immediately adjacent each corner of the bottom panel, said double delta flap having a height less than the height of said adjacent side wall panels.

Such an arrangement effectively prevents leakage of liquid at the corner regions of the package, even during dethawing of the product.

Further advantageous embodiments of the present invention are detailed in the dependent claims.

In the enclosed drawing there is shown a blank for a package according to the present invention.

The blank in the drawing is identified as a blank for a top-loaded package comprising a bottom panel 10, long side wall panels 11, 12, short side wall panels 13, 14, a top panel 15, short side wall panel 16, 17 and a glue flap 18. As mentioned previously, the bottom 10 and the top 15 do not actually act as top and bottom after the package has been filled and sealed. Instead, the combination of short wall panels 13, 14, 16 and 17 form a top and bottom respectively. In this case there is a tearing strip 19 for opening up of a filled package. In the present case, the figure represents the inside of the blank and this side as well as the outside is coated by a thermoplastic, heat sealable material, for instance polyethylene. For sealing a filled package, the inside of the outermost portion of flap 17 is sealed to the outside of the outermost end portion of flap 13, and when the strip 19 is torn

off, the contents of the package will be accessible via the end having flaps 13, 17 forming a breakable end closure.

Reference numerals 20, 21 indicate the shape of a conventional full length double delta corner flap. The square-shaped corner panel indicated in phantom lines 20 and representing a full length conventional corner flap, is divided into two right angle triangles by a crease line 21. When erecting adjacent side walls, for instance walls 12 and 13, the conventional double delta flap is folded along line 21 and the triangular or delta shaped double folded material is placed against the outside or inside of one of the adjoining side walls and attached thereto. As mentioned in the introduction, this procedure requires contact heat sealing or other complex procedures for maintaining the "bottom" part of the blank in an erect position.

According to the present invention, an arrangement is provided which maintains the liquid-tight corner characteristics of the conventional double delta type of corner but which allows the use of simple tuck-in means for attachment of adjacent side walls to each other and maintaining them in an erect state.

Thus, the long side walls 11, 12 of the blank are provided with extended portions 22, 23, 24, 25, each one of such portions comprising a "mini" double delta flap 26, 27, 28, 29 having a height less than the height of the adjacent side walls. Each mini double delta flap merges into a relatively larger tuck-in portion having a nose 30, 31, 32, 33 directed away from the mini double delta flap when the package blank is laid flat. Each nose 30, 31, 32, 33 is intended to be inserted into a respective slot formed by punched out lines 34, 35, 36, 37 in the short side wall panels 13, 14.

The actual design allows the placement of each flap 22, 23, 24, 25 at the outside of a respective one of the end panels 13, 14 with the nose 30, 31, 32, 33 inserted into the slot formed by a respective one of the lines 34, 35, 36, 37. The mini triangles or deltas at the corner portions of the bottom panel 10 will also be placed at the outside of panels 13, 14. No explicit vertical line has been shown in the drawing for defining the extension or the transition region between the double delta 26 and the remaining portion of the flap 22, but it is to be understood that the mini double delta form comprises two congruent right angle triangles of which one is located at each corner of the bottom panel 10.

The height of the double delta or the cathetus length of the corresponding right angle triangle is, as previously mentioned, less than the height of either of the adjacent side walls and in a preferred embodiment the double delta height (equal to the cathetus length of the right angle triangles in the drawing) falls in the interval of 1/10 to 1/5 of the side wall height.

In order to erect and fill the package, the blank in the drawing is placed on an automatic line for erection, filling and sealing blanks of the actual type comprising a first station where the side wall panels 11, 12 and 13, 14 are erected and, according to the invention, the mini delta flaps 26, 27, 28, 29 together with remaining parts of flaps 22, 23, 24, 25, are folded up at the same time as respective side walls 12, 11, such that the double folded mini deltas or mini triangles are placed at the outside of end panels 13, 14 and the noses 13, 31, 32, 33 inserted into respective slots 34, 35, 36, 37.

Thereafter the erected tray part of the top-loaded package is transported to a filling station where a block of, for example, deep frozen berries is led down into the tray for further transport to a sealing station where the broad side panel 15 and end panel 16, 17 and glue panel 18 are folded down to cover the product. Flaps 16, 17, 18 are glued to the outside of panels 13, 11 and 14, respectively, such that the tearing off of strip 19 opens up the cross section of the packaging end for allowing access to the product packed in the package. It is preferable that the mini delta flaps have a crease line which defines the hypothenuse of the congruent triangles forming the double delta flap. This measure effectively avoids the risk that the double delta be accidentally pushed into the interior of the package which, of course, would result in leakage and other difficulties.

The invention is not limited to the embodiment described above and shown in the drawing, but may be varied within the scope of the appended claims. For example, the bottom panel 10 may have a square shape so that the side wall panels 11, 12 and 13, 14 are of equal length. Although it is preferable that the side wall panels are of equal height, it will be apparent that the side wall panel 11 remote from the top panel may be of lesser height that the remaining side wall panels since the glue flap 18 effectively overlaps panel 11.

Claims

1. A package formed from a blank of cardboard or other foldable material comprising a bottom panel (10), opposite pairs of side wall panels (11, 12; 13, 14) integral with said bottom panel and foldable along creasing lines (38-41), and delta flap type of attachable flaps (22, 23, 24, 25) extending between adjacent side wall panels for maintaining said blank in an erected state after folding said side wall panels along said creasing lines, **characterized in** that each delta type flap comprises a double delta flap (26, 27, 28, 29) substantially in the form of two congruent right angle triangles located immediately adjacent each corner of the bottom panel (10), said double delta flap having a height less than the height of said adjacent side wall panels.

2. A package according to claim 1, **characterized in** that the height of the double delta flaps is in the interval of 1/10 to 1/5 of the adjacent side wall panel height.

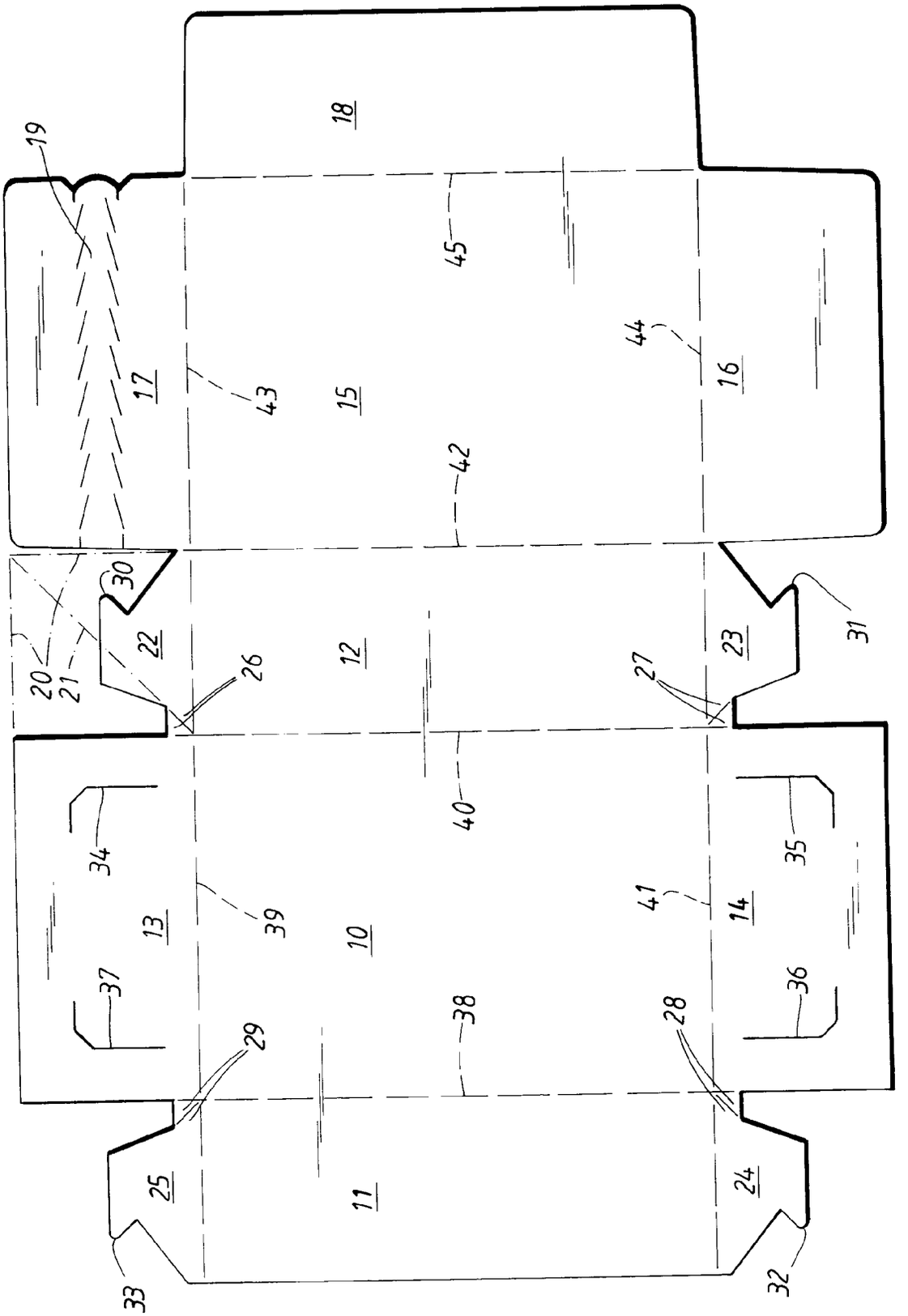
3. A package according to claim 1 or 2, **characterized in** that a region of the delta type flap is arranged as a tuck-in flap.

4. A package according to claim 3, **characterized in** that said region of the delta type flap is in the form of a nose (30, 31, 32, 33) which is adapted to be insertable into a slot (34, 35, 36, 37) in one pair (13, 14) of said opposite pairs of side wall panels.

5. A package according to claim 3 or 4, **characterized in** that the delta type flap has a shape according to that depicted in Fig. 1.

6. A package according to any of the preceding claims, **characterized in** that the blank further comprises a top panel (15) having an opposite pair of side wall panels (16, 17) and a glue flap (18).

7. A package according to claim 6, **characterized in** that a removable tearing strip is integrally formed in one (19) of said side wall panels of the top panel (15).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PARTIAL EUROPEAN SEARCH REPORT

which under Rule 45 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number EP 92 85 0230

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. 5)
X Y	FR-E-42 531 (ÉTS. THIOLAT) * figures *	1,3-4 6-7	B65D5/24 B65D5/30
Y	WO-A-8 603 726 (SPRINTER SYSTEM) * page 3, paragraph 2; figure 1 *	6-7	
A	EP-A-0 171 275 (OWENS-ILLINOIS) * page 1, line 13 - page 2, line 37; figure 1 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl. 5)

B65D

INCOMPLETE SEARCH

The Search Division considers that the present European patent application does not comply with the provisions of the European Patent Convention to such an extent that it is not possible to carry out a meaningful search into the state of the art on the basis of some of the claims

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
THE HAGUE	06 JANUARY 1993	BRIDAULT A.A.Y.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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EP 92 85 0230 -C-

INCOMPLETE SEARCH

Claims searched completely : 1-4,6-7 (if not dependent on claim 5)

Claim not searched : 5

Reason : Rule 29(6) EPC.