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(54) A blank having folding lines for forming a container.

(57) A blank for forming a container by folding the blank along longitudinal folding lines (2) into tubular shape, sealing a sealing panel (P_5) onto a sealing area of a side wall panel (P_1) of the tube and then folding top and bottom wall poritons (3, 3a, 3b, 4, 4a, 4b) inwardly along transverse folding lines (5, 6, 7) has gaps or interruptions (8) of the transverse folding lines formed within said sealing panel (P_5) and sealing area. When folding the overlapped and sealed sealing panel (P_5) and side panel (P_1), any leakage that might occur between the overlying portions of the tranverse folding lines (5, 6, 7) will not extend into said gaps (8), whereby the sealing conditions can be maintained.

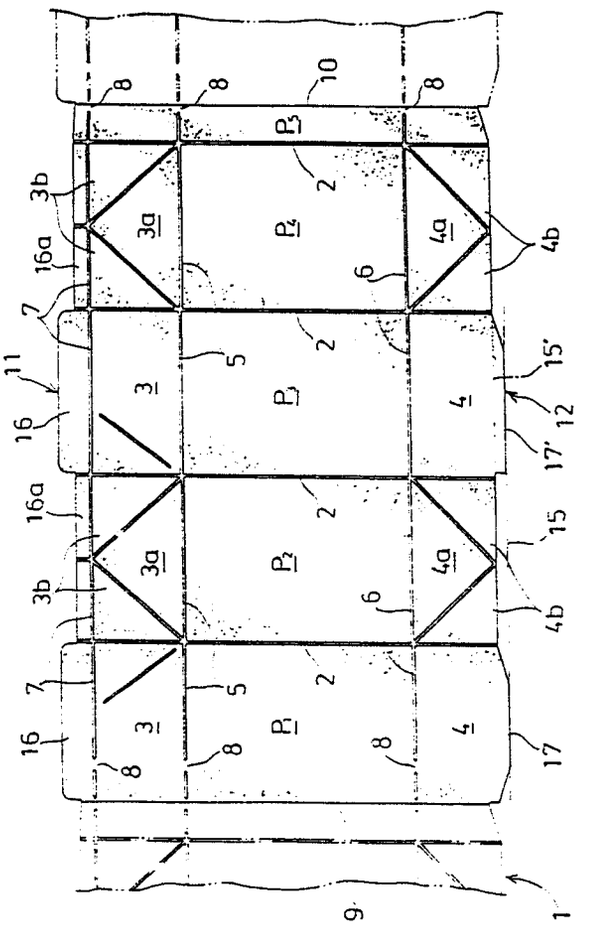


Fig. 1

EP 0 277 517 A1

A blank having folding lines for forming a container

The invention relates to a blank for forming a container as defined in the preamble portion of claim 1.

Blanks of these type are usually used for forming packaging containers containing beverages such as milk or juice, these containers being usally brick shaped or gable-topped containers. Packaging containers of these types are manufactured from a web having paper or cardboard support layers and external liquid-tight plastic layers, in some times including a layer of further material such as a aluminium foil. In manufacturing the containers, the blanks are usually cut from a continuous web which is printed and laminated. The blank is folded along the longitudinal folding lines to form polygonal tube, usually a tube of rectangular or square cross section, the sealing panel is sealed or heat-welded onto a sealing area of one of the side panels, and then the bottom wall portions are folded inwardly and sealed together to form a bottom of the container. After the contents are filled into the container, to the top wall portions are folded and sealed to form a flat or gable top part of the container.

In the aforementioned manufacturing of the containers, the following problem araises: When the sealing panel is sealed or heat-welded onto a sealing area of the side panel, longitudinal folding lines formed by creasing, embossing etc. have already been pre-formed in these parts, and at these longitudinal folding lines the sealing panel may not lie sufficiently flat and tight against the corresponding sealing area of the side panel. Faulty or inperfect sealing may occur along these folding lines. Afterwards, when bottom-or top wall portions are folded inwardly along these longitudinal folding lines, the wall material of the overlapping sealing panel and wall panel may be folded away from each other and thereby lose their contact, whereby a leakage along said folding lines may occur.

It is an object of the invention to provide a blank of the aforementioned kind, in which leakage occurring along folding lines extended through overlapping and heat-sealed portions of the container can be effectively prevented.

According the invention, this object is achieved by the blank as defined in claim 1. The dependent claims relate to further advantages improvements of the blank.

According to the invention, gaps are provided in the longitudinal folding lines at positions inside the sealing panel and the corresponding sealing area of the side wall panel,preferably along the free edge of the sealing panel, whereby the overlapping panels will come flatly and closely into contact with each other, will be perfectly sealed or heat-welded to each other even in the area of said gaps, and will maintain the tight sealing condition in said gaps even when the overlapping panels are folded along said folding lines. In other words, any leakage which might occur along said longitudinal folding lines will be stopped or interrupted by virtue of the present of the aforementioned gaps.

An embodiment of the invention will be described in conjunction with the acomponaying drawings.

Fig. 1 is plan view showing a blank according to the invention being part of a continuous web.

Fig. 2 is a perspective view showing the upper part of a tubular packaging container formed from the blank according to fig. 1, before closing the top;

Fig. 3 is a perspective view of a gable-topped packaging container formed from the blank according to fig. 1;

Fig. 4 is a perspective view of the bottom part of the packaging container of fig. 3.

According to fig. 1, a blank for a packaging container is formed out of a lenghty web 1 (usually rolled to form a roll), which is formed of paperboard both sides of which are coated with thermoplastic coating material, which web has two opposite side margin lines 11 and 12 shaped with a repeated pattern over the whole width of each piece of blank, each blank being separated by two straight parallel left and right end margin lines 9 and 10. Each blank is formed such that is has four side wall panels P_1, P_2, P_3, and P_4 separated by parallel longitudinal folding lines 2, 2 and 2 ... and a longitudinal sealing panel P_5 with a narrower width between the end margin line 10 and the longitudinal folding line 2 on the outside of the side wall panel P4 on the one side (right side).

Panels 3, 3a and 3b for forming a top lid part of packaging container are separated from the upper side of four side wall panels P_1, P_2, P_3 and P_4 by upper transverse folding lines 5, and panels 4, 4a and 4b for forming a bottom part of the packaging container are provided on the lower side by way of lower transverse folding line 6 respectively. Additionally, sealing panels 16, 16a, ... for forming a sealing fin part of the top are provided on the outside of the top lid forming panels by way of top transverse folding line 7.

As shown in fig. 2, the blank is first folded to form a square tube, so that the longitudinal folding line 2 defining the longitudinal sealing panel P_5 is made to coincide with the end margin line 9 of the side wall panel P_1 on the side opposite to said

sealing panel P_5. In other words, the left inner margin area of side wall panel P_1 in fig. 2 is a sealing area which is inwardly overlapped by said sealing panel P_5. These overlapped parts P_1, P_5 are then sealed or welded with heat.

The container bottom part is then formed by folding small triangle panels 4b against the inside of respective opposite main bottom panels 4 provided at the lower part of the blank, said main bottom panels 4 being folded to overlap the outside of opposite large triangle panels 4a and 4a being inwardly folded, using lower transverse folding line 6 has hinges.

The lower side margin 12 of the blank is so formed that the boundary line 15 on the outside of main bottom panels 4 is protruding with a convex shape over the boundary line 15' of the triangle parts 4b, whereby the bottom central parts 17 and 17' are formed on the main bottom panels 4 between the boundary lines 15 and 15'. When a packaging container is formed, the central part 17' on the one side is insertable between the opposite main bottom panel 4 and its adjoining triangle panel parts 4a and 4b.

In this manner, a pair of bottom central parts 17 and 17' extruding out of the inward boundary line 15' at the pair of main bottom panels 4 are overlapped to be positioned symmetrically at the central position of the bottom of packaging container. Thereby, the bottom central sealing part is strengthened uniformly (see fig. 4).

This construction enables the bottom having a steady and complete sealing property to be obtained after being sealed.

After packing the liquid contents, a top lid part is sealed and formed such that small triangle panels 3b are arranged to be folded into the inside of opposite main top panels 3 at the top of tubular open packaging container (refer to fig. 2), whereby said main top panels 3 and 3 after folding are located outwardly, and opposite large triangle panels 3a are folded inwardly, respectively, by using the upper transverse folding line 5 as hinge means. Further by way of top folding line 7, opposite sealing panels 16 are overlapped, welded and sealed to form a top sealed fin part with small sealing panels 16a being interposed therebetween (see fig. 3).

All the aforementioned folding lines 2, 5, 6, 7, are formed in the usual manner by creasing, embossing etc. as known in the art.

When a packaging container (fig. 3) is formed from a tubular container material (fig. 2) in this way, the overlapped and welded part of longitudinal sealing panel P_5 and the side marginal part of sealing area of opposite side wall panel P_1 have to be folded at the respective positions of the three transverse folding lines 5, 6 and 7.

For avoiding leakage to occur at these positions, gaps or interruptions 8 of the respective folding lines 5, 6 and 7 are provided adjacent the end margin of edge so of the sealing panel P_5 and at corresponding positions in side wall panel P_1. These gaps overlie each other and enable the inside and outside panels P_5, P_1 along the side margin 10 of the overlapped and welded are a to be folded in a state of being flatly and closely in contact, and thus a state of close contact and sealing is satisfactorily maintained during foldding without destroying the good sealing property over the entire length of the sealing panel P_5.

Claims

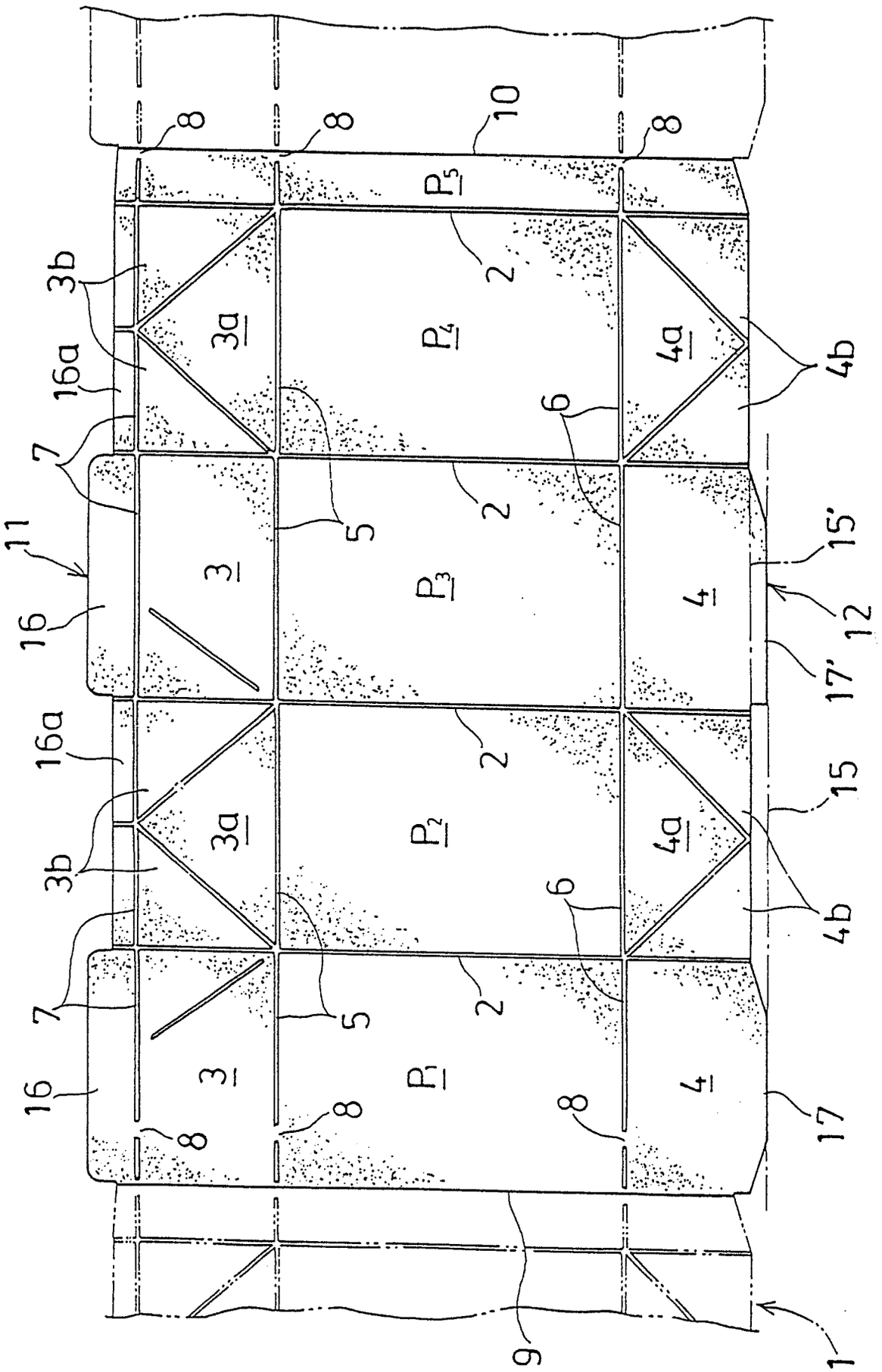
1. A blank made of plastic-coated cardboard or similar material for forming a container, said blank being divided by a plurality of longitudinal folding lines (2) into a plurality of wall panels (P_1-P_4) and a sealing panel (P_5) and being foldable along said longitudinal folding lines into a polygonal tube with said sealing panel (P_5) being sealable onto a sealing area of one (P_1) of said wall panels, and comprising at least one transverse fold line (5, 6, 7) extending through the wall panels (P_1-P_4) and the sealing panel (P_5) for folding end portions (3, 3a, 4, 4a, 16, 16a) of the side walls of the tube to form top lid and/or bottom walls of the container, **characterized** in that gaps (8) are formed in said at least one transverse folding line (5, 6, 7) at positions inside said sealing panel (P_5) and said sealing area at positions such that said gaps (8) overlie each other when said sealing panel (P_5) overlaps said sealing area.

2. A blank as claimed in claim 1, **characterized** in that said gaps (8) are located adjacent the free longitudinal edge (10) of said sealing panel (P_5).

3. A blank as claimed in claim 1 or 2, **characterized** in that the blank has three transverse folding lines (5, 6, 7), each having gaps (8) adjacent to the free edge of the sealing panel (P_5) and at a corresponding position in the sealing area of said one side panel (P_1).

4. A blank as claimed in claim 1, **characterized** in that said blank has four side wall panels (P_1 to P_4) to form a rectangular or square container and four bottom wall panels joined to said side wall panels by a longitudinal fold line, two bottom wall panels being further divided by diagonal fold lines into triangular panel parts (4a, 4b) and the two other bottom wall panels (4) having end portions (17, 17') extending over the center line (15) of the bottom to be formed, one of these bottom wall

panel end portions (17, 17') being insertable between the triangular wall sections (4a, 4b) adjoining the opposite bottom wall panel (4).


8
8
10
8
P_5
2
3b
3a
P_4
4a
4b
16a
6
7
5
2
11
3
P_3
4
15'
16
12
17'
16a
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3b
3a
P_2
4a
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P_1
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Fig. 1

Fig. 3

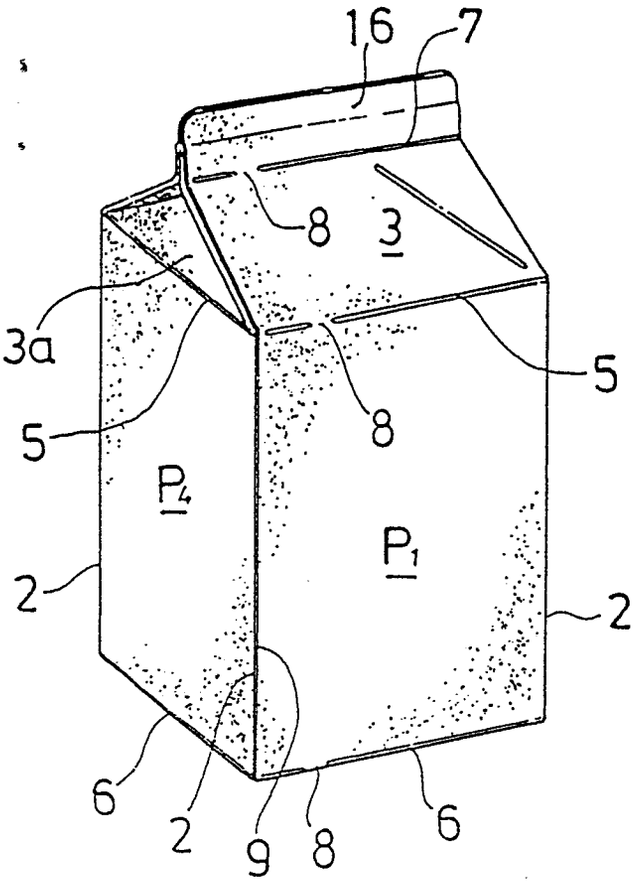


Fig. 2

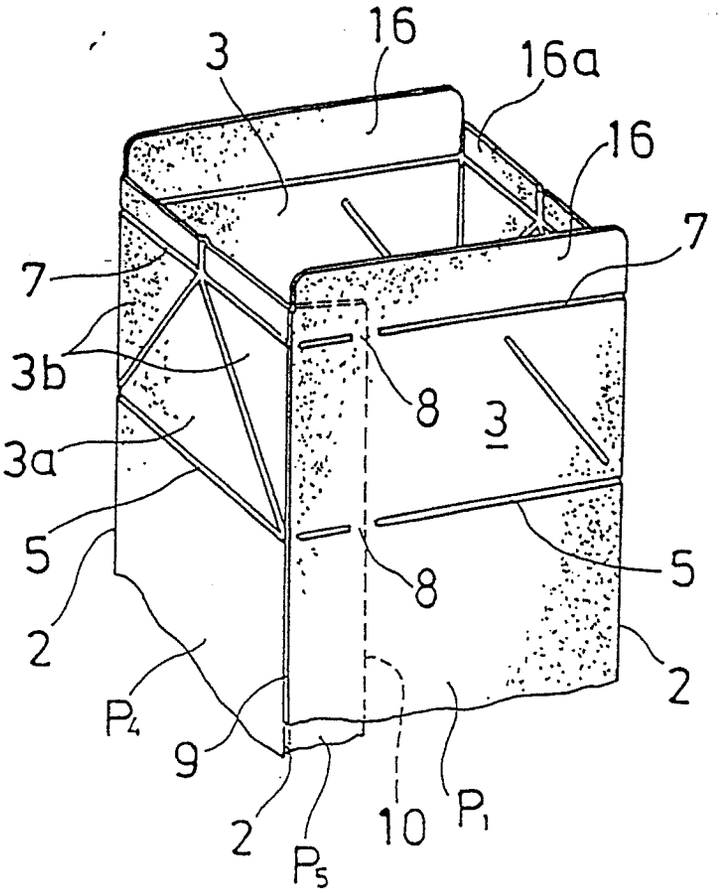
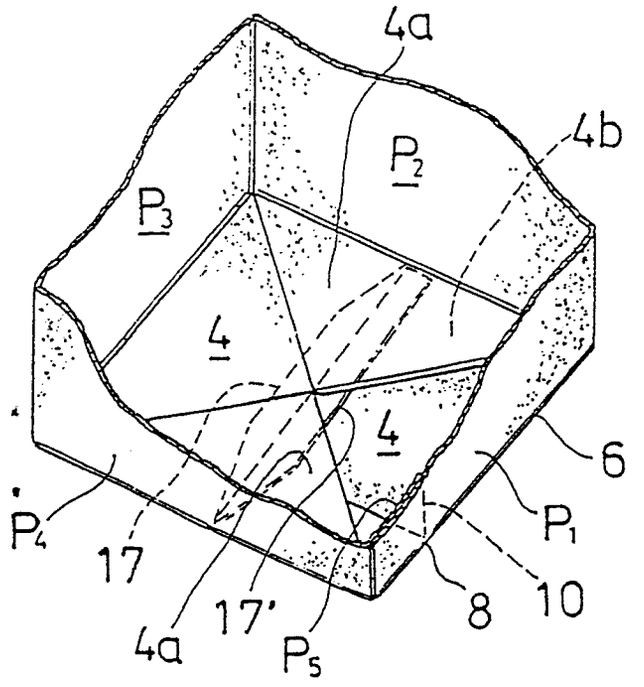


Fig. 4



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 10 0471

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.4)
A	FR-A-2 456 613 (REINE) * Page 5, lines 1-10 *	1	B 65 D 5/06 B 65 D 5/42
A	EP-A-0 176 278 (JUJO PAPER) * Page 11, claims 1-2; figures 1,4 *	1	
A	EP-A-0 074 340 (TETRA PAK) * Figures 1,3 *	4	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

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	22-04-1988	BESSY M.J.F.M.G.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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