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

(11) Publication number: **0 112 553**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **83112911.9**

(51) Int. Cl.³: **B 65 D 5/06**

(22) Date of filing: **21.12.83**

(30) Priority: **22.12.82 NO 824328**

(43) Date of publication of application: **04.07.84**
Bulletin 84/27

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

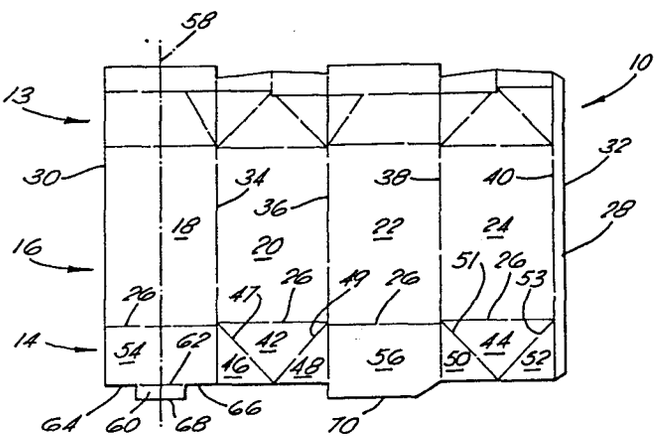
(71) Applicant: **Elopak A/S, N-3430 Spikkestad (NO)**

(72) Inventor: **Engen, Gunnar, Emil Stangs vei 19b, N-1346 Gjettum (NO)**
Inventor: **Frydendal, Tom, Kongleveien 49, N-Oslo 8 (NO)**
Inventor: **Slungaard, Svein, Loviveien 2, N-3470 Slemmestad (NO)**

(74) Representative: **Patentanwälte Zellentin, Zweibrückenstrasse 15, D-8000 München 2 (DE)**

(54) Blank of sheet material being convertible to a container for liquid substances by folding about score lines, and a container made from the blank.

(57) A container of thermoplastic coated cardboard has a bottom closure of a known type having two triangular infold panel portions, a pair of triangular fold-back panel portions lying on either side of each triangular infold panel portion and two outer bottom closure panels (54, 56) overlapping each other in the completed bottom closure. In order that the free outer edge of the lowermost (54) of the two outer bottom closure panels shall have no raw edge exposed to the inside of the container, the bottom closure panel (54) has a fold-back tab (60) which is folded back onto the outside surface of the bottom closure panel (54). According to the invention the outer edges (64, 66) of the bottom closure panel (54) on either side of the fold-back tab (60) are offset from the outer edge (68) of the fold-back tab (60) towards the associated side wall panel (18). Thereby it becomes possible to perform the folding back of the fold-back tab (60) by means of the edge (70) of the outermost bottom closure panel (56), the consumption of cardboard being at the same time reduced.



EP 0 112 553 A2

PATENTANWÄLTE
ZELLENTIN
ZWEIBRÜCKENSTR. 15
8000 MÜNCHEN 2

Elopak A/S
N-342o Spikkestad
Norway

December 21, 1983
Eu 83288
Ke/K

Blank of Sheet Material Being Convertible to a Container For Liquid Substances by Folding About Score Lines, and a Container Made From the Blank

The invention relates to containers for liquid substances, preferably containers made from thermoplastic coated paperboard, and more specifically a novel folded bottom closure for such containers.

It is well known that paperboard used in containers for milk and juice can be economically coated on both sides with heat and pressure sensitive thermoplastic substances. An example of a suitable thermoplastic material which is useful in connection with packings for milk products, is polyethylene.

The paperboard material from which the containers are made, is coated on both sides with a layer of thermoplastic material, preferably polyethylene having a determined thickness. Blanks are then cut from the thus made paperboard roll and scored to permit folding

into a tubular shape having readily foldable and sealable leakage-free top and bottom closures. The paperboard material can be a laminate which in addition to paperboard and polyethylene layers comprises an oxygen impervious layer such as an aluminium foil. This layer is positioned below the polyethylene layer facing the interior of the container. For the oxygen impervious layer to have its maximum effect it is desirable that the finished bottom closure should not contain any blank raw edge exposed to the interior of the container.

A container having an infolded bottom closure which is very satisfactory in this respect, is the container illustrated and described in US patent specification 3.412.922.

The blank from which this container is produced, comprises four side wall panels, pairs of which are of equal width, mutually connected bottom closure panels forming extensions of the side wall panels at the lower ends thereof and a side seam flap positioned at one edge of the blank and extending over substantially the full height of the blank, said side seam flap being adapted to be sealed to the margin of the side wall panel and the bottom closure panel lying at the opposite side of the blank to produce a tubular container blank having a rectangular cross-section. The bottom closure panels comprise two substantially equilateral triangular infold panel portions, each connected to a separate one of two side walls panel portions having the same width and opposing each other in the tubular blank, two pairs of triangular fold-back panel portions, each pair being associated with

a separate one of the infolded panel portions, the foldback panel portions of each pair lying on either side of the associated infold panel portion, and two outer bottom closure panels, each connected to a separate one of the two remaining side wall panels, which have the same width, one of said outer bottom closure panels having a height sufficient to overlap the other after being folded down, thereby to form a liquid-tight bottom closure upon sealing of the bottom closure panels, the other of the outer bottom closure panels having a fold-back tab extending to both sides of the common longitudinal centre line of said other bottom closure panel and the associated side wall panel, said fold-back tab having a smaller width than said other outer bottom closure panel and preventing the bottom closure from having a raw edge exposed to the interior of the container upon folding back of the fold-back tab onto the outer side of said other bottom closure panel. It is true that also without such a folding back it would in theory be possible to prevent exposure of a raw edge to the interior of the container, since said other of the outer bottom closure panels can be given such a height that its outer edge will lie in a centre plane through the container, thereby being covered by the triangular infold panel portions, the apices of said triangular infold panel portions meeting in this centre plane, provided the container has a square cross-section. However, it is very difficult to make the apices of the triangular infold panel portions meet exactly and cover the raw edge completely, and for some uses it is therefore desirable to maintain the fold-back tab.

However, a disadvantage of the fold-back tab illustra-

ted in US patent specification 3.412.922 is that it requires a separate process step and a separate member in the machine erecting the blank into tubular shape and closing and sealing the bottom.

Accordingly, it is an object of the invention to provide a bottom closure having a fold-back tab preventing an inner raw edge, which bottom closure can be folded into closed position without the use of special elements or process steps in addition to those required with usual bottom closures having no fold-back tab.

Another object of the invention is to povide a blank for such a container comprising less sheet material.

These objects are obtained by offsetting the outer edges of said other outer bottom closure panel on either side of the fold-back tab from the outer edge of the fold-back tab towards the associated side wall panel. The outer edges of said other outer bottom closure panel on either side of the fold-back tab are preferably aligned with the score line about which the fold-back tab is folded.

The invention also related to a container made from a blank as defined above.

Further features and advantages of the invention will be apparent from the following description, reference being made to the drawing.

Figure 1 is a layout view of a blank according to the invention, seen from the side forming the inside of the finished container.

Figure 2 is a side view of the lower end of the container made from the blank during the bottom closure folding step.

Figure 3 is a sectional view along the line III-III in Figure 2 after folding of the bottom closure so as to be ready for sealing.

Figure 4 shows the bottom of the container seen from below.

Figure 5 is a sectional view along the lines V-V in Figures 3 and 4, respectively, showing the bottom closure completely folded, but not yet sealed.

Referring to the drawing, Figure 1 shows a blank 1o of a flat sheet material such as plastic coated cardboard. The blank lends itself to forming into a tubular container blank having a square cross-section. The lower end of such a tubular container blank 12 is illustrated in Figure 2. The upper end of the blank 1o has top closure panels 13 which are of known design and will therefore not be described further. The lower end of the blank 1o has bottom closure panels 14. Between the top closure panels 13 and the bottom closure panels 14 there is a group 16 of panels comprising four side wall panels 18, 2o, 22 and 24. The panel group 16 is delimited from the bottom closure panels 14 by means of a score line 26, which is preferably staggered. The purpose of the score line 26 being staggered in the form shown, is to accommodate the thickness of the sheet material as it is bent along the score lines when making the bottom closure, thus preventing crowding of the material at the various

corner junctions of the score lines.

The blank 1o also comprises a side seam flap 28 extending over substantially the full height of the side wall panels 18, 2o, 22, 24, the top closure panels 13 and the bottom closure panels 14. The side seam flap 28 is adapted to be sealed to the margin of the side wall panel 24 and the adjacent bottom closure and top closure panels to form the tubular container blank 12. The blank 1o is defined laterally by edges 3o and 32, the side seam flap 28 and the side wall panels 18 to 24 being separated by score lines 34, 36, 38 and 4o. These score lines extend over the entire height of the blank 1o.

The bottom closure panel group 14 comprises two substantially equilateral triangular infold panel portions 42 and 44, each connected to a separate one of two side wall panel portions 2o and 24, respectively, opposing each other in the tubular blank 12. With each pair of infold panel portions 42, 44 there is associated a pair of triangular fold-back panel portions 46, 48 and 5o, 52, respectively, the fold-back panel portions of each pair lying on either side of the associated infold panel portion. There are further provided two outer bottom closure panels 54, 56, each connected to a separate one of the two remaining side wall panels 18, 22, which have the same width. One of said outer bottom closure panels 56 has a height sufficient to overlap the other outer side wall panel 54 after being folded down, thereby forming a liquid-tight bottom closure upon sealing of the bottom closure panels 14. The other 54 of the outer bottom closure panels has a fold-back tab 6o extending to both sides of the common longitudinal centre line 58 of the bottom closure

panel 54 and the associated side wall panel 18. The tab 6o has a smaller width than the bottom closure panel 54 and accordingly does not extend to the edge 3o and the score line 34, respectively. The tab 6o is intended to be folded back onto the outside surface of the bottom closure panel 54, as best shown in Figure 5. The folding back takes place about a score line 62 which delimits the fold-back tab 6o from the remaining portion of the bottom closure panel 54. The outer edges 64, 66 of the bottom closure panel 54 on either side of the fold-back tab 6o are offset from the outer edge 68 of the fold-back tab 6o towards the associated side wall panel 18. More specifically, the outer edges 64 and 66 are aligned with the score line 62.

To construct a container having a bottom closure according to the invention a flat blank 1o is first formed, said blank being then converted to a flattened tubular blank by folding about the score lines 38 and 34 and sealing of the side seam flap 28 to the inside of the side wall panel 18 and the adjacent top closure and bottom closure panels. The sealing may be effected by any of the well known sealing methods for the plastic coating, such as heat, sound or light. The flattened tubular blank is next opened into a tubular container blank 12 having a rectangular cross-section on a mandrel (not shown) with the bottom closure panels 14 extending outwardly from the mandrel. Following this the container bottom is infolded in a conventional manner, the triangular infold panel portions 42, 44 being folded about the score line 26, the pairs of triangular fold-back panel portions 46, 48 and 5o, 52, respectively, being rotated about the

diagonal score lines 47, 49 and 51, 53, respectively, delimiting these fold-back panel portions from the respective infold panel portions 42 and 44. At the same time the outer bottom closure panels 54 and 56 will be pulled along inwardly, rotating about the score line 26. When the outer infold panel portions 54, 56 have reached a certain inclination, the further infolding of the bottom closure panels may be performed by rails acting against the outer bottom closure panels 54, 56. When the outer bottom closure panels 54, 56 reach the position shown in Figure 2, the outer edge 7o of the said one bottom closure panel 56 will engage the fold-back tab 6o and fold this tab rearwardly about the score line 62. When the bottom closure panels are further folded in, the fold-back tab 6o will be bent fully back onto the outer side of the other outer bottom closure panel 54, and the outer margin of the said one outer bottom closure panel 56 will cover the side of the folded fold-back tab 6o originally being the inside thereof, as illustrated in Figures 3 and 4. In this fully infolded position of the bottom closure panels the bottom of the container is sealed, using any of the well known sealing method for the plastic coating.

Thereby a bottom closure is obtained which does not have any raw edge exposed to the inside of the bottom closure. Thereby the tightness of the container in respect of the passage of oxygen is improved. The tightness of the container in respect of the leakage of liquid is also improved. At the same time a smaller amount of sheet material is consumed than by use of the bottom closure illustrated in US patent specification 3.412.922. It is true that the portions that

have been omitted, constitute scrap, but this scrap is not without value. On the contrary, it has a commercial value, since it can be used in the manufacturing of other products.

It should be evident that the blank according to the invention does not have to take exactly the form illustrated in the drawing. Thus, the blank may be a mirror immage of the form illustrated, i.e. it may have an outside surface looking as shown in Figure 1. Compared with the tubular blank 12 the side seam may further be positioned between other side wall panels than the panels 18 and 24 as shown. It is also possible to provide the side seam flap 28 at any of the two edges 3o and 32.

PATENTANWÄLTE -1-
ZELLENTIN
ZWEIBRÜCKENSTR. 15
8000 MÜNCHEN 2

Elopak A/S
N-342o Spikkestad
Norway

December 21, 1983
Eu 83 288
Ke/K

C l a i m s

1. A blank of sheet material having an overall surface coating of a thermoplastic material that becomes adhesive when subjected to heat, said blank being convertible to a container for liquid substances by folding about score lines and sealing, said blank (1o) comprising four side wall panels (18 to 24), pairs of which are of equal width, mutually connected bottom closure panels (14) forming extensions of the side wall panels (18 to 24) at the lower ends thereof, and a side seam flap (28) positioned at one edge (32) of the blank (1o) and extending over substantially the full height of the blank, said side seam flap being adapted to be sealed to the margin of the side wall panel (24) and the bottom closure panel (14) lying at the opposite end of the blank to produce a tubular container blank (12) having a rectangular cross-section, said bottom closure panels comprising two substantially equilateral triangular infold panel portions (42, 44) each connected to a separate one of two side wall panel portions (2o, 24) having the same width and opposing each other in the tubular blank (12), two pairs of triangular fold-back

panel portions (46, 48, 5o, 52), each being associated with a separate one of the infold panel portions (42, 44), the fold-back panel portions of each pair lying on either side of the associated infold panel portion (42, 44), and two outer bottom closure panels (54, 56), each connected to a separate one of the two remaining side wall panels (18, 22), which have the same width, one of said outer bottom closure panels having a height sufficient to overlap the other (54) after being folded down, thereby to form a liquid-tight bottom closure upon sealing of the bottom closure panels (14), the other (54) of the outer bottom closure panels having a foldback tab (6o) extending to both sides of the common longitudinal centre line (58) of said other bottom closure panel (54) and the associated side wall panel (18), said fold-back tab (6o) having a smaller width than said other outer bottom closure panel (54) and preventing the bottom closure from having a raw edge exposed to the interior of the container upon folding back of the fold-back tab onto the outer side of said other bottom closure panel,

c h a r a c t e r i z e d i n that the outer edges (64, 66) of said other outer bottom closure panel (54) on either side of the fold-back tab (6o) are offset from the outer edge (68) of the fold-back tab (6o) towards the associated side wall panel (18).

2. A blank according to claim 1, c h a r a c t e r - i z e d i n that the outer edges (64, 66) of said

other outer bottom closure panel (54) on either side of the fold-back tab (6o) are aligned with the scored line (62) about which the fold-back tab (6o) is folded.

3. A container made from a blank according to any of the preceding claims.

0112553

Fig. 1.

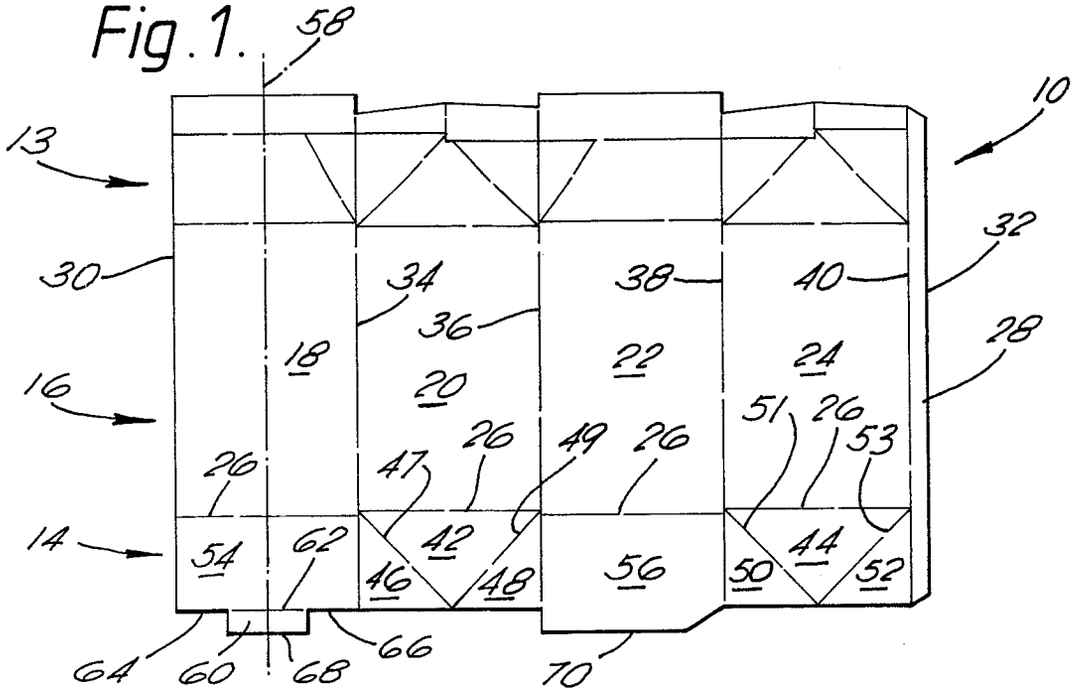


Fig. 2.

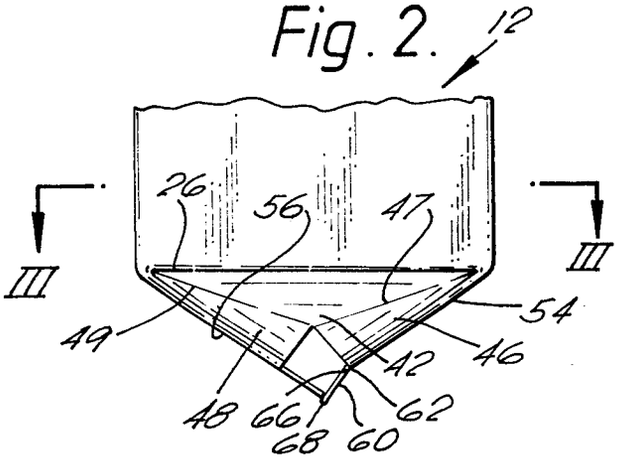


Fig. 3.

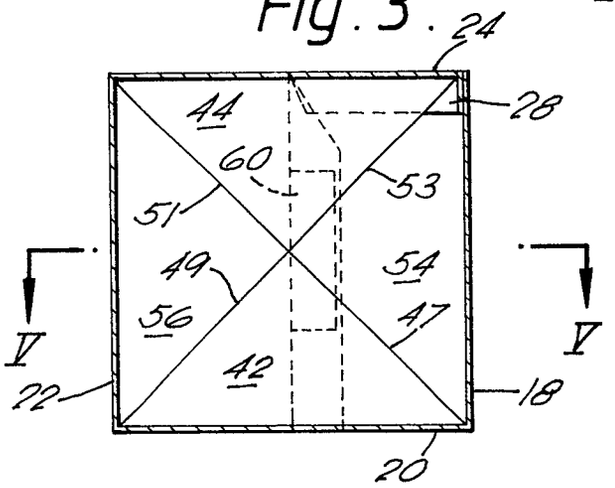


Fig. 4.

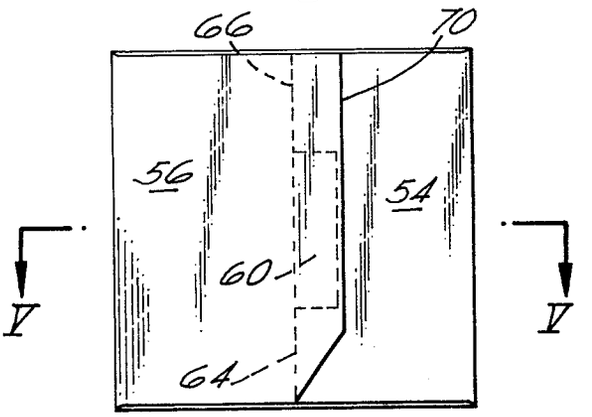


Fig. 5.

