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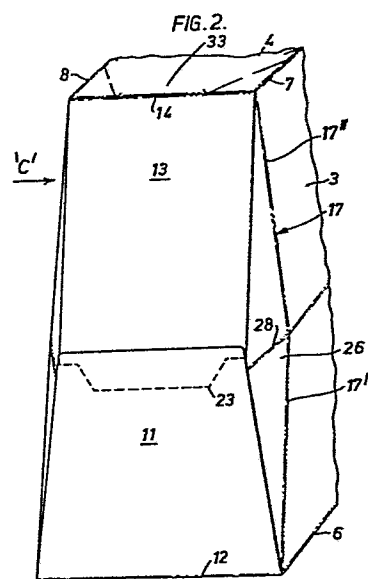
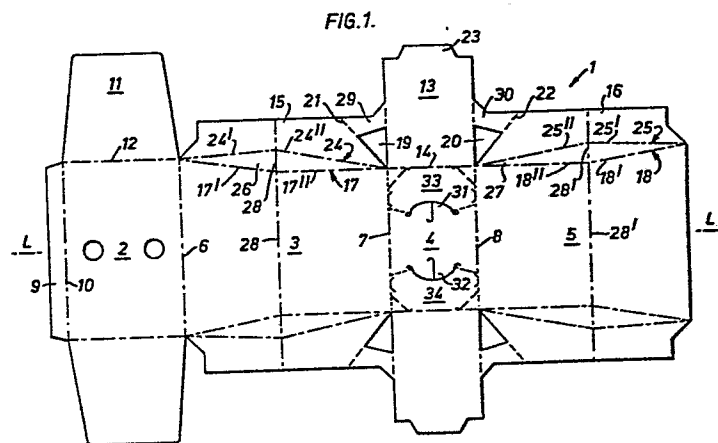
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(54) **Carton for beverage containers.**

(57) An end loadable carton for accommodating beverage containers such as bottles or cans includes a bottom wall (2), a top wall (4) interconnected by foldably joined side walls (3, 5) to provide a generally tubular structure and an end closure arrangement including an end flap (15, 16) foldably joined to each side wall, and a gusset panel (26, 27) intermediate each end flap and the adjacent side wall, the gusset panel having a lower portion with side edges which are divergent in a direction away from the bottom wall and an upper portion with convergent side edges.



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CARTON FOR BEVERAGE CONTAINERS

This invention relates to a carton particularly of the end-loading type suitable for accommodating beverage containers such as bottles or cans.

Known cartons of similar construction, but of the wrap-around type, take the form of a generally enclosed case having end closure panels which are adapted to bend so as to conform more closely to the shape of those containers which are in contact with the end closure panels thus tending to provide a tighter fitting package. However, the extent of conformity of the end panels with respect to the packaged articles in known constructions is limited by the manner in which the end closure panels are scored with bend lines.

The present invention results from an appreciation that modification in the arrangement of such bend lines in the end closure panels results in a tighter fitting package.

One aspect of the invention provides a carton for accommodating beverage containers which carton comprises a bottom wall, a pair of side walls foldably joined respectively to the

side edges of said bottom wall, a top wall foldably joined respectively to the upper edges of the side walls thereby providing a tubular structure wherein each end of said tubular structure has a pair of end flaps foldably joined respectively
5 to said side walls which end flaps are foldable inwardly across said end, and an end closure panel foldably joined to said bottom wall and foldable upwardly into overlapping relationship with said end flaps, each of said end flaps being formed with a fold line adjacent the adjoining fold line between that end
10 flap and the respective side wall, said fold lines together defining the side edges of a gusset panel having an initial lower portion with side edges which are divergent in the direction away from said bottom wall and an upper portion remote from said bottom wall having non-divergent side edges.

15 Specific embodiments of the invention, by way of example, are now set forth in the following description taken in conjunction with the accompanying drawings, in which:-
Figure 1 is a plan view of a blank from which a carton is formed,
20 Figure 2 is a perspective view of one end of a carton formed from the blank shown in Figure 1,
Figure 3 is a plan view of a modified blank from which another carton is formed,
Figure 4 is a perspective view of one end of a carton formed
25 from the blank shown in Figure 3,
Figure 5 is a plan view of a further modified blank from which yet another carton is formed, and
Figure 6 is a perspective view of one end of a carton formed from the blank shown in Figure 5.

30 Referring to the drawings, Figure 1 shows a blank 1 of paperboard or similar foldable sheet material for forming a

carton 'C' for accommodating rows of bottles and comprises a bottom wall panel 2, a side wall panel 3, a top panel 4 and a further side wall panel 5. The bottom wall panel 2 is foldably joined to one transverse edge of the side wall panel 3 along a transverse fold line 6. The opposite transverse edge of side wall panel 3 is foldably joined to one transverse edge of top panel 4 along a transverse fold line 7 and the opposite transverse edge of top panel 4 is foldably joined to the further side wall panel 5 along a transverse fold line 8. The free edge of bottom wall panel 2 includes a glue strip 9 foldably joined to the bottom wall panel along transverse fold line 10.

The blank is symmetrical about the longitudinal centre line "L-L" and for ease of understanding reference is made to those portions of the blank above the centre line "L-L" which depict the closure construction at one end of the carton 'C' as shown in Figure 2.

A bottom end closure panel 11 which tapers towards its free end is foldably joined to the bottom wall panel 2 along a longitudinal fold line 12 and a top end closure panel 13 is foldably joined to the top wall panel 4 along longitudinal fold line 14. Integral end flap panels 15, 16 are foldably joined to the side walls 3, 5 along longitudinal fold lines 17, 18 respectively. The end flap panels 15, 16 also are integral with and foldably joined to the top end closure panel 13 along the transverse fold lines 7, 8 respectively. In order to facilitate folding of the top end closure panel 13 about fold line 14 the top end panels 15, 16 are each formed with generally deltoid openings 19, 20 located in the case of panel 15 between transverse fold line 7 and an oblique fold line 21, and in the case of panel 16 between transverse fold line 8 and an oblique

fold line 22. The free end of the top end closure panel includes an integral tongue portion 23.

Each of the end flap panels 15, 16 are formed with further fold lines 24, 25 extending adjacent fold lines 17, 18 5 respectively and defining a pair of gusset panels 26, 27. The fold line 17 comprises two angularly related portions 17', 17" which meet at a transverse fold line 28 extending centrally across side wall panel 3. Similarly, fold line 24 comprises two angularly related portions 24', 24" which meet at the 10 transverse fold line 28. The fold lines 17, 24 together define the side edges of the gusset panel 26.

Likewise fold line 18 comprises two angularly related portions 18', 18" which meet at transverse fold line 28' extending centrally across side wall panel 5. Similarly, fold 15 line 25 comprises two angularly related portions 25', 25" which meet at transverse fold line 28'. The fold lines 18 and 25 together define the side edges of gusset panel 27.

The angular relationships of the fold lines defining gusset panels 26 and 27 are chosen such that the adjacent fold 20 lines 17', 24' and 17" and 24" are divergent in a direction towards the transverse fold line 28 and the adjacent fold lines 18', 25' and 18", 25" are divergent towards the transverse fold line 28'.

To erect the blank to form a completed carton 'C', first 25 side wall panel 5 is bonded to the glue strip 9 thus bringing the blank to a sleeve like configuration ready for loading with bottles or other containers through the opposed open ends of the sleeve. To close that end of the blank previously describe the end flap panels 15, 16 are folded inwardly across the open

end of the sleeve about their respective fold lines 17, 18 thus causing the top end closure panel 13 to initiate folding about fold line 14. The top end closure panel will begin to fold owing to the folding movement of the integral tuck-in straps 29, 30 defined between fold lines 7, 21 and 8, 22 respectively and the panel 13 eventually will be brought into overlapping relationship with the upper portions of end flap panels 15, 16 and secured thereto. To complete the end closure the bottom end closure panel 11 is caused to fold about fold line 12 and is brought into overlapping relationship with the lower portions of end flap panels 15, 16 and secured thereto. The free end of bottom end closure panel 11 also is overlapped with and secured to the tongue 23 integral with top panel 13. Thus one end of the carton 'C' is completely closed with the top and bottom end closure panels 11, 13 meeting at about mid height of the carrier as shown in Figure 2. The carton panels are sized such that the overall carton width reduces towards its top end whereby the top panel 4 is narrower than bottom panel 2. Reduction in width is more prominent in the top section of the carton i.e. above the continuous central fold line constituted by transverse fold lines 28, 28'. The tightness of the carton end structure is enhanced by the construction of the corner gusset panels which are shaped to conform closely to the containers accommodated adjacent the corners of the carton. Thus each gusset panel has side edges which are divergent in a direction away from bottom panel 2 up to the point of intersection with fold lines 28, 28' whereafter the gusset panel side edges are convergent towards the top panel 4.

It will be appreciated that the opposite end of the carton i.e. below centre line "L-L" is of similar construction and is closed in a fashion similar to that described above.

To facilitate carrying and opening the carton 'C' the top panel 4 is formed with gripping apertures defined by push-in tabs 31, 32 and tearaway panels 33, 34 defined by perforate score lines formed in the top panel. When tear-away panels 33, 34 are removed and discarded a central section of the top panel between tabs 31, 32 remains, thus providing a handle by which the carton can be grasped. This feature allows the carton to be used for returning empty beverage containers.

Referring now to Figures 3 of the drawings there is shown a blank 1a of paperboard or similar foldable sheet material in which like parts of Figure 1 are designated like reference numerals but with the addition of suffix "a".

The main structural difference between the carton 'C' of this embodiment and that previously described is that openings are provided in each top corner of the carton (see Figure 4) so that the contents of the carton can be seen. To achieve this feature the apertures 19a, 20a of blank 1a are enlarged as compared with apertures 19, 20 of blank 1. The aperture 19a cuts into panel 3a, 13a and takes out a substantial portion of panel 15a. Similarly, aperture 20a cuts into panels 5a, 13a and takes out a substantial portion of panel 16a. Hence, each of the gusset panels 26a, 27a are shortened relative to gusset panels 26, 27 so that the upper portions of those panels i.e. the small portions above the central transverse fold lines 28a, 28a' stop short of the carrier top panel 4. Nevertheless, the construction of the gusset panels in this embodiment achieves the tightness of fit required in that as with the previous embodiment the initial part of each gusset panel has side edges which are divergent in a direction away from the bottom panel 2a up to the point of intersection with fold lines 28, 28' whereafter the side edges are convergent in a direction towards the corner apertures 19a, 20a respectively.

It will be appreciated that the opposite end of the carton 'C' i.e. below centre line "L-L" is of similar construction and is closed in a fashion similar to that described above. Moreover, it is envisaged that top panel 4a may be provided with the carrying and openings features previously described in relation to carton 'C'.

Referring now to Figure 5 of the drawings there is shown a blank 1b of paperboard or similar foldable sheet material in which like parts of Figure 1 are designated like reference numerals but with the addition of suffix "b". The layout of blank 1b also is different to that of blanks 1 and 1a previously described in that a part of one side wall panel 5b is shown integral with top wall panel 4b and the remaining part of side wall panel 5b is shown integral with bottom wall panel 2b. The effect of this layout is that both the side flap panels 15b, 16b depend from the bottom wall panel prior to glueing the blank into its sleeve-like configuration. This is necessary since the carton of this embodiment is not provided with a top wall end closure panel as in the previous embodiments.

However, the carton 'C2' is assembled in a similar fashion in that first the blank 1b is brought into a sleeve-like configuration by bonding the glue strip portion 9b of side wall panel 5b in overlapping relationship with the opposite part of side wall panel 5b. After the carton has been end-loaded with containers as previously referred to the carton ends are closed. In the example shown, the end flap panels 15b, 16b are folded inwardly across the open end of the sleeve about their respective fold lines 17b, 18b. This folding operation causes the bottom end closure panel 11b to initiate folding about fold line 12b. The bottom end closure panel will begin to fold owing to the folding movement of the integral tuck-in flaps 35, 36

provided between bottom end closure panel 11b and each of end flap panels 15b and 16b respectively. The tuck-in flap 35 will fold flat against the inside face of bottom end closure panel 11b by folding about oblique fold lines 37, 38 and
5 similarly the tuck-in flap 36 will fold flat against the inside face of bottom end closure panel 11b by folding about oblique fold lines 39, 40.

To complete the end closure (see Figure 6), folding of the bottom end closure panel 11b is continued so as to bring it
10 into overlapping relationship with the end flap panels 15b, 16b and secured thereto. It will be appreciated that the opposite end of the carrier i.e. below centre line "L-L" is of similar construction and is closed in a fashion similar to that just described. Thus, the carton ends are closed only at the bottom
15 section so that the contents of the carrier can be viewed through the open top portions of the end closures as best seen in Figure 6 of the drawings.

The tightness of the carton structure with respect to its contents is achieved in a manner similar to that previously
20 described in that each gusset panel has side edges which are divergent in a direction away from the bottom panel 2b up to the point of intersection with central transverse fold lines 28b, 28b' whereafter the gusset panel side edges are convergent towards the top most edges of the respective end flap panels.

25 An adequate degree of tightness is particularly important with regard to the carton 'C2' of this embodiment in that the end structure is partially open so that secure retention of the beverage containers is desirable to prevent accidental dislodgement or pilferage.

As in the embodiment of Figures 1 and 2, in order to facilitate carrying and opening of the carton, the top panel 4b is formed with handle apertures defined by pushing tabs 31b, 32b and tear-away panels 33b, 34b provided by perforate
5 score lines formed in the top panel. This construction permits the carton 'C2' to be used for returning empty beverage containers as mentioned previously.

It is envisaged that at least with respect to the cartons 'C', and 'C2' adequate tightness of the carton end
10 structure may be obtained if the upper portions of the gusset panels have side edges which are parallel to one another rather than convergent as described and shown. For example, with respect to Figures 5 and 6, the fold line portions 18b", and 25b" of gusset panel 27b may be formed parallel to one
15 another and similarly fold line portion 17b" and 24b" of gusset panel 26b may be formed parallel to one another. However, the convergent arrangement as described and shown is to be preferred.

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CLAIMS

1. A carton for accomodating beverage containers which carton comprises a bottom wall (2), a pair of side walls (3, 5) foldably joined respectively to the side edges of said bottom wall, a top wall (4) foldably joined respectively to the upper edges of the side walls thereby providing a tubular structure, wherein each end of said tubular structure has a pair of end flaps (15, 16) foldably joined respectively to said side walls which end flaps are foldable inwardly across said end, and an end closure panel (11, 13) foldably joined to said bottom wall and/or said top wall and foldable into overlapping relationship with said end flaps, characterized in that each of said end flaps is formed with a fold line (24, 25) adjacent the adjoining fold line (17, 18) between that end flap and the respective side wall, said fold lines together defining the side edges of a gusset panel (26, 27) having an initial lower portion with side edges (17', 24') which are divergent in a direction away from said bottom wall and an upper portion remote from said bottom wall having non-divergent side edges (17'', 24'').

2. A carton according to Claim 1, further characterized

in that the side edges (17", 24") of said upper portion of each gusset panel are convergent in a direction towards said top wall.

3. A carton according to Claim 1 or Claim 2, further
5 characterized in that said end closure panel (11b) is foldably connected to each of said end flaps by a tuck flap (35, 36), said tuck flap causing end closing movement of the end closure panel automatically when the end flaps are folded inwardly across said end, and being foldably joined to said
10 end closure panel and a respective end flap (15b, 16b) so as to lie flat therebetween when the end closure panel is brought into its end closing position.

4. A carton according to Claim 1 or Claim 2 further characterized in that each of said end flaps (15b, 16b) and
15 said end closure panel (11b) extend from the bottom wall towards, but stop short of, said top wall thereby leaving open an upper portion of said end so that containers accommodated adjacent that end of the carrier have upper parts exposed to view.

20 5. A carton according to any of the preceding claims, further characterized in that said end closure panel (11, 13) covers both end flaps but leaves said gusset panels exposed.

6. A carton according to any of claims 2 to 5, further characterized in that the convergent side edges (17", 24") of
25 each gusset panel extend from a location intermediate the uppermost edge of said end closure panel (11) and said bottom wall.

7. A carton according to any of Claims 2 to 6, further characterized in that the junction between said divergent and convergent portions of each gusset panel is defined by a transverse fold line (28) located intermediate the top
5 and bottom walls respectively and extending across said end flaps and said side walls of the carton.

8. A carton according to Claim 1 or Claim 2, further characterized in that the end closure panel (13) foldably joined to said top wall is foldably connected to each of
10 said end flaps (15, 16) by tuck-in straps (29, 30), said tuck-in straps causing end closing movement of the top end closure panel automatically when the end flaps are folded inwardly across said end.

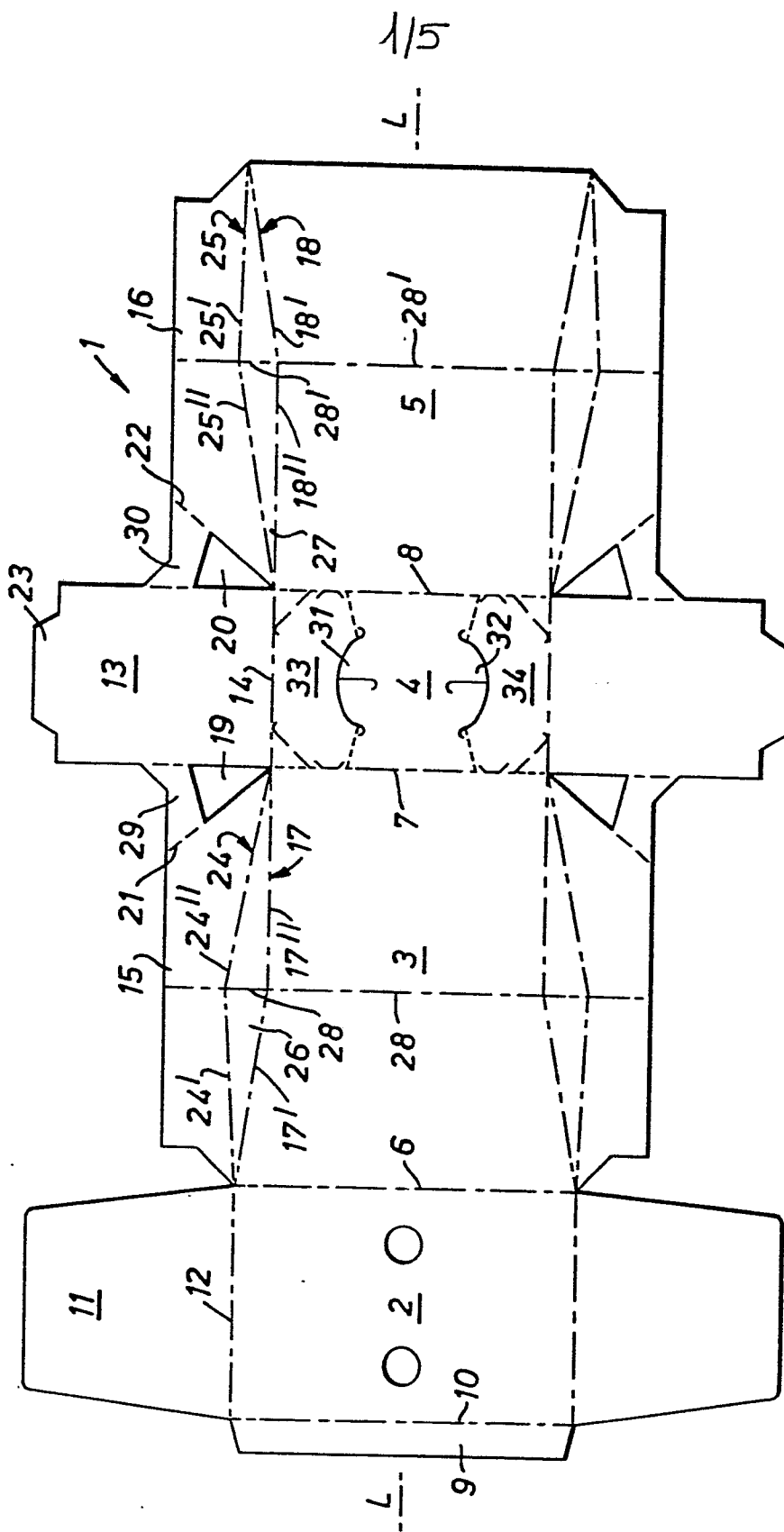
9. A carton according to Claim 8, further characterized
15 in that openings (19a, 20a) are provided between said top end closure panel (13a) and each of said side walls (3a, 5a) so that containers accommodated adjacent that end of said carton have upper parts exposed to view, each of said openings being formed by material removed from the top wall (4a) and
20 the respective adjoining side wall and end flap.

10. A carton according to any of Claims 1 to 8, further characterized in that said top wall includes a pair of tear-away panels (33, 34) to provide access to the contents of the carton, said tear-away panels being spaced apart by a
25 portion of the top wall, said portion providing a carrying strap when the tear-away panels are removed.

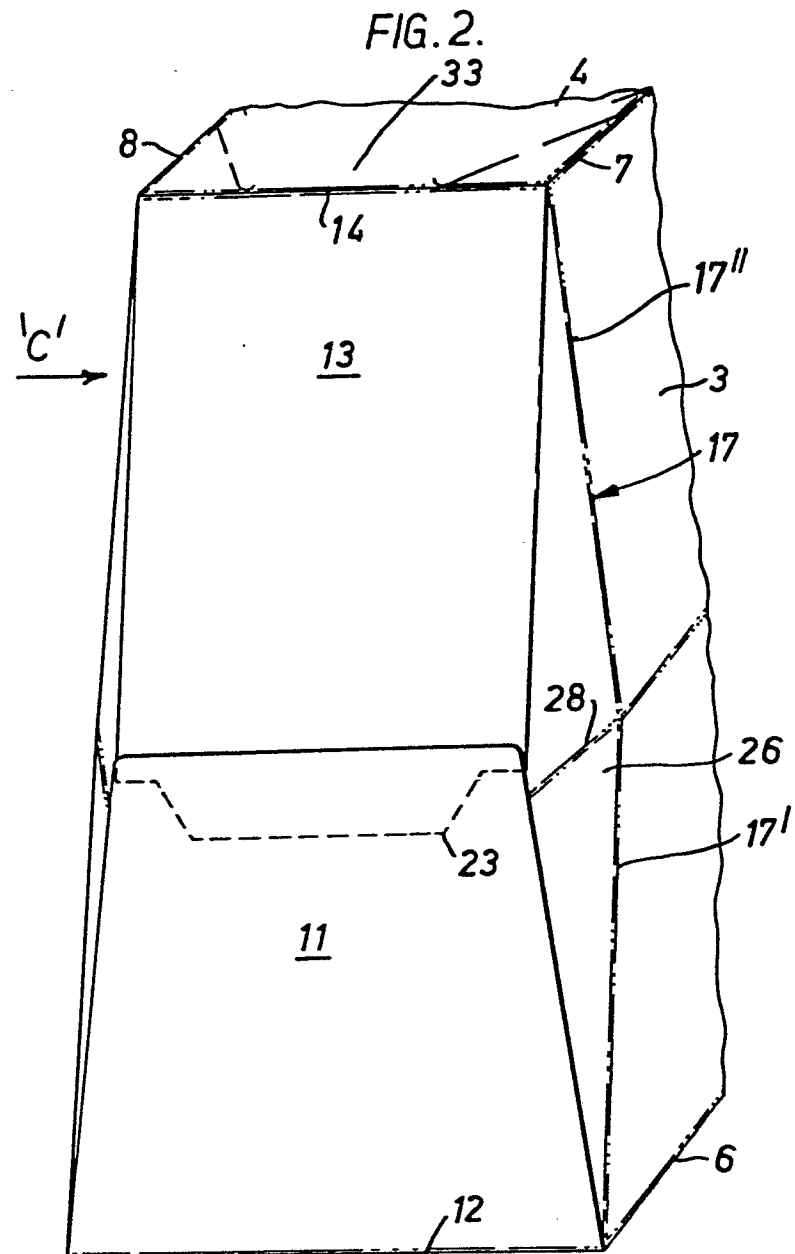
11. A blank for forming a carton which blank comprises a bottom wall panel (2), a top wall panel (4) and a pair of side wall panels (3, 5) all having longitudinal and transverse

edges and being foldably joined along their transverse edges in series such that one of said side wall panels (3) is located between and foldably joined to each of said side wall panel and said top wall panel, the blank further comprising end closure panels (11) foldably joined along opposed longitudinal side edges of said bottom wall panel, and end flaps (15, 16) foldably joined along opposed longitudinal side edges of each of said side wall panels, characterized in that an integral gusset panel (26, 27) is provided between each side wall panel and the adjacent end flap, each of said gusset panels being defined by a pair of spaced fold lines (17, 24; 18, 25) which are divergent in a direction extending away from one transverse edge of the side wall panel associated with that end flap, said divergent portion of said spaced fold lines terminating at a location intermediate the ends of said gusset panel whereafter said spaced fold lines are convergent in a direction extending towards the opposite transverse edge of said associated side wall panel.

FIG. 1.

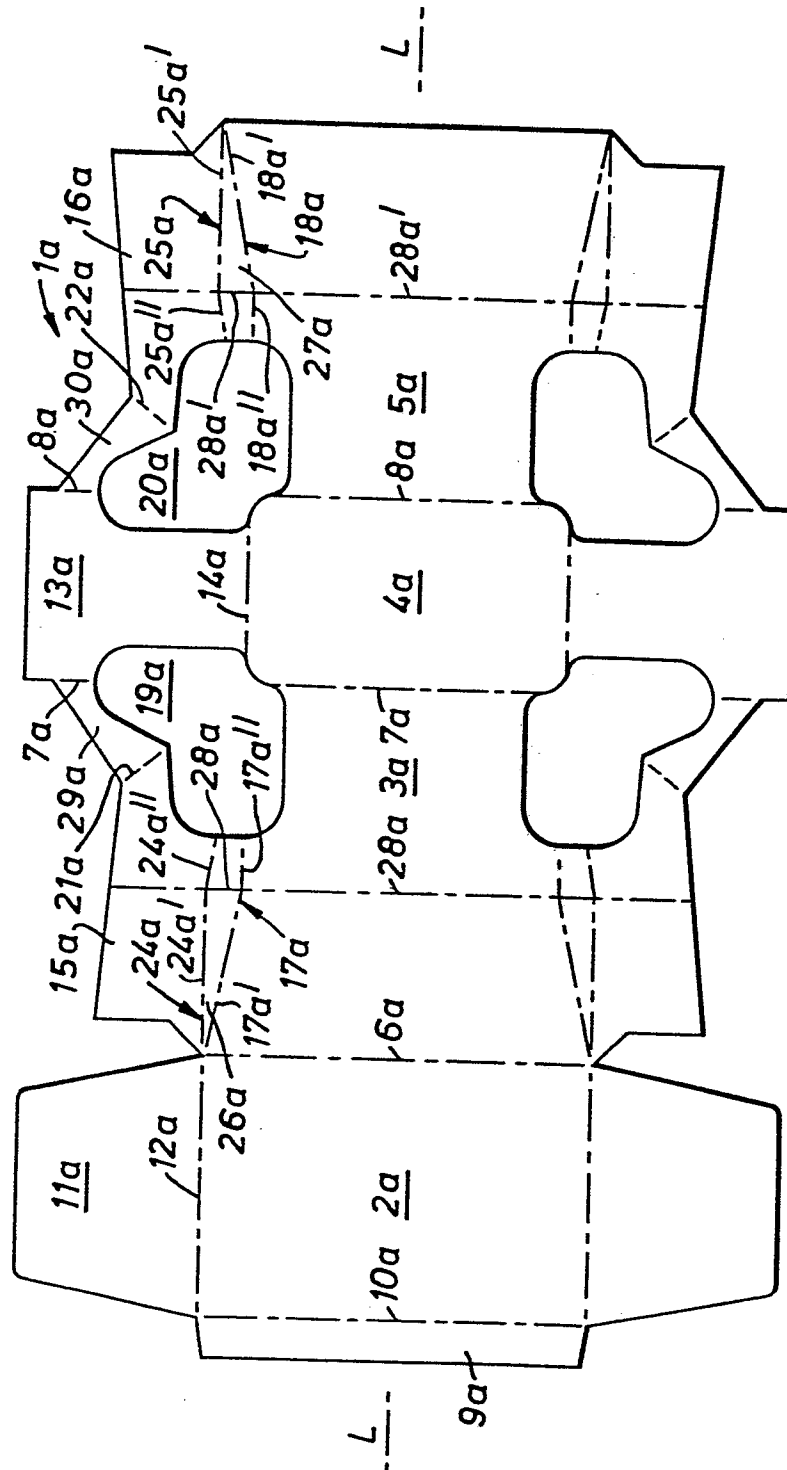


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FIG. 3.



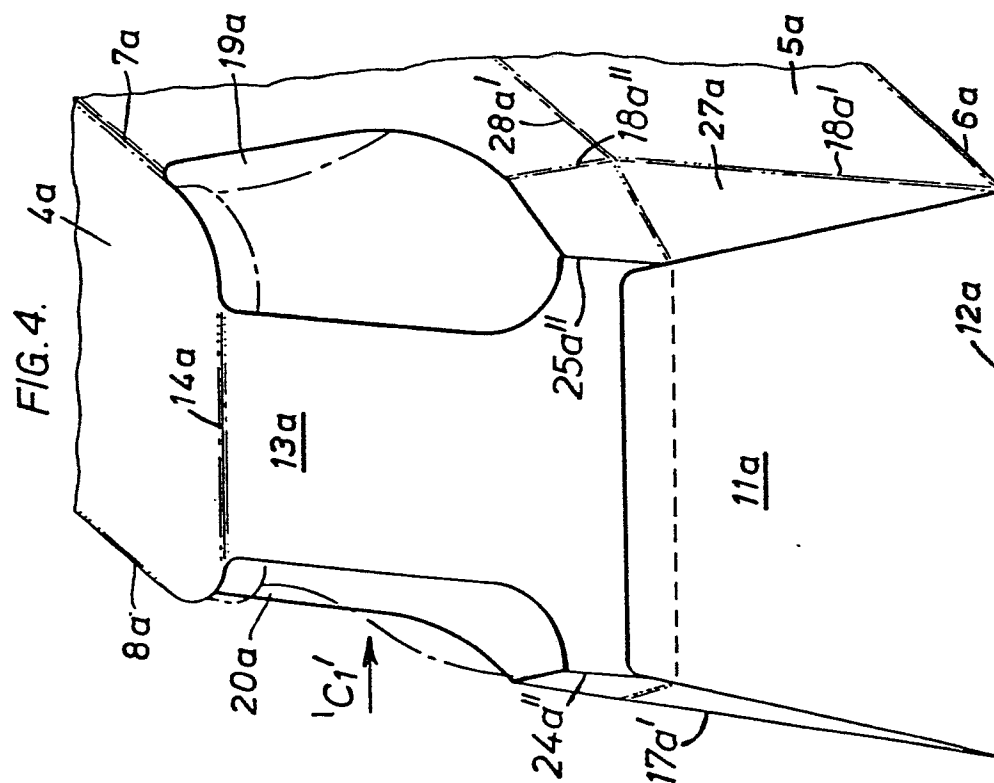
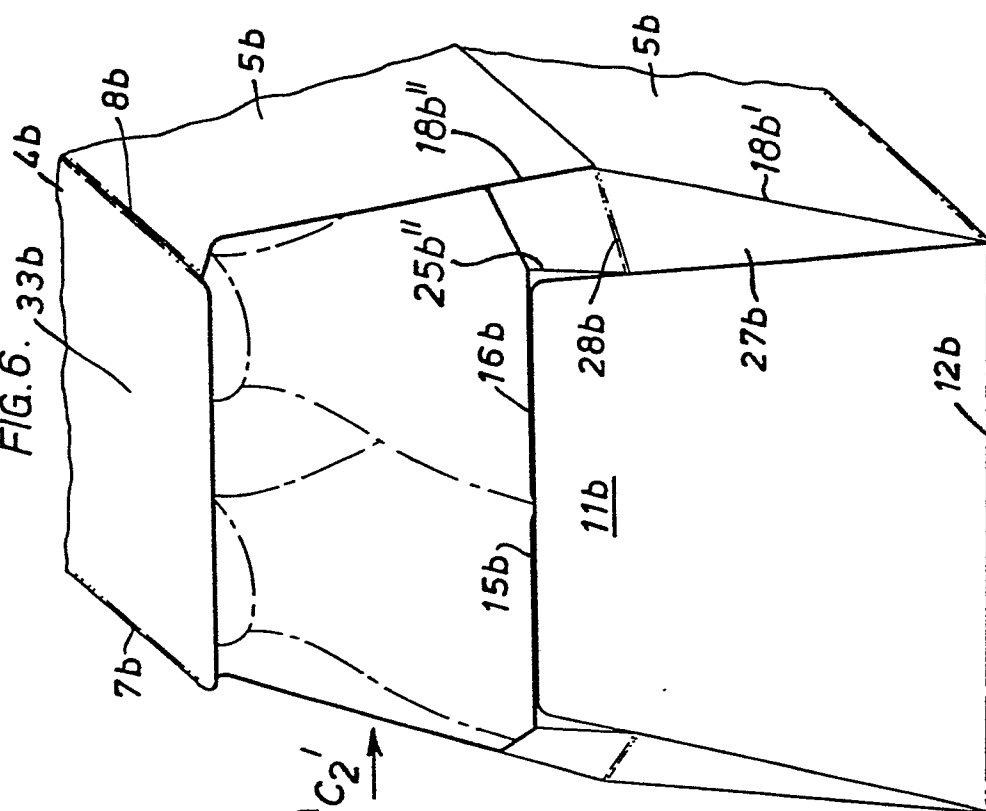
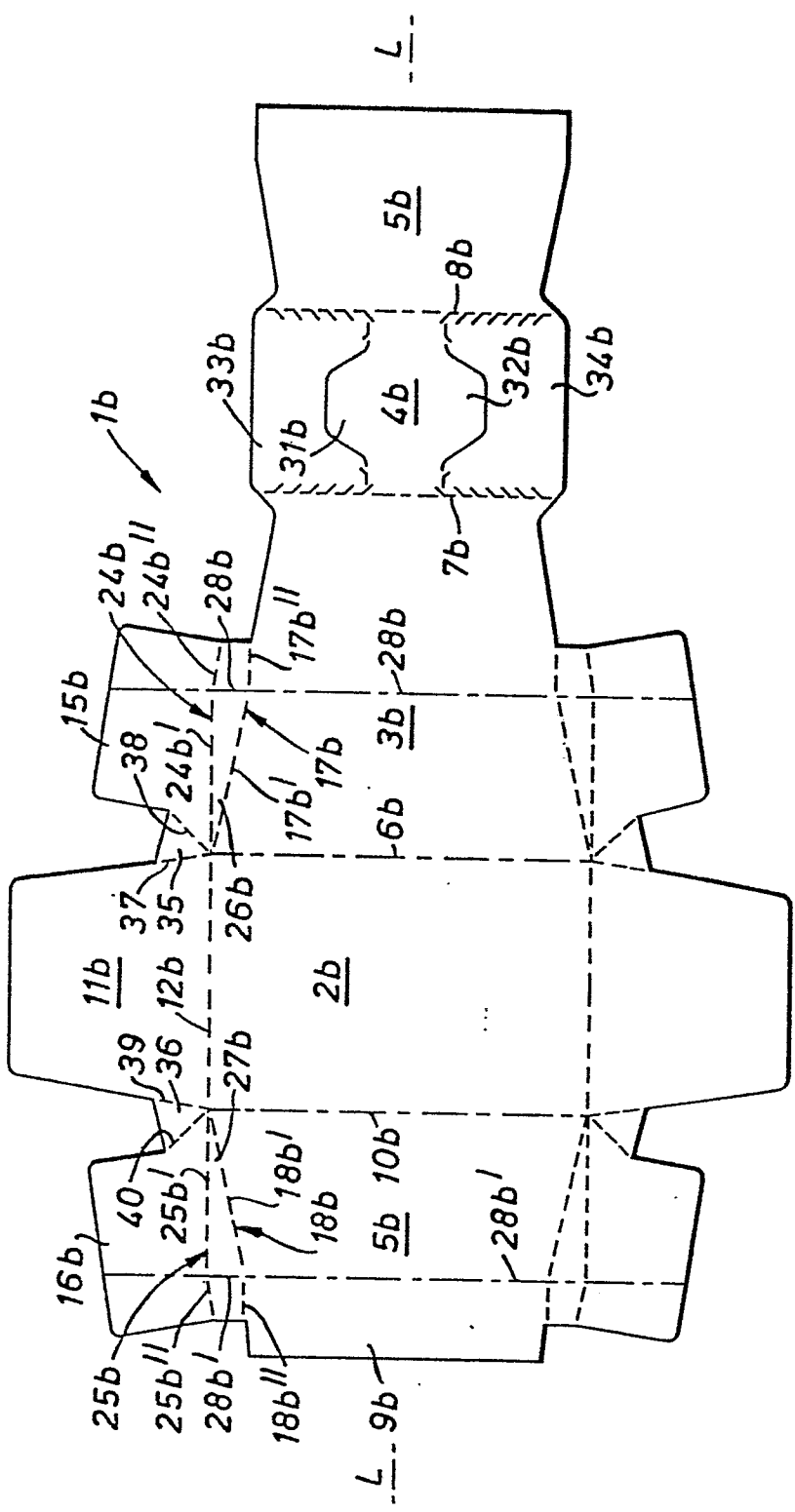


FIG. 5.





European Patent
Office

EUROPEAN SEARCH REPORT

0044169

Application number

EP 81 30 2979

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	US - A - 4 101 069 (IN THE NAME OF APPLICANT) * Whole document *	1-3, 11	B 65 D 71/00
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	US - A - 4 032 053 (OLINKRAFT) * Whole document *	1, 10	

			TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			B 65 D
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			&: member of the same patent family. corresponding document
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
The Hague	13-10-1981	MARTIN	