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(71) Applicant: **Trimbach Verpakking B.V.**
Ravelstraat 28
NL-4614 XD Bergen op Zoom(NL)

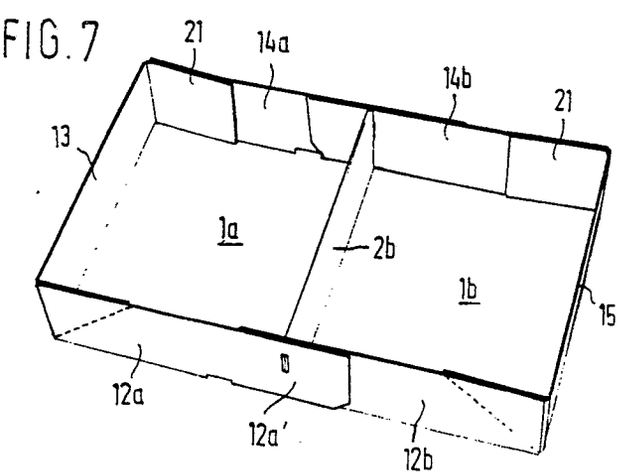
(72) Inventor: **Trimbach, Raymundus Gerardus Lambert Joseph**
Jeneverbes 1
NL-4635 BN Huybergen(NL)

(74) Representative: **Smulders, Theodorus A.H.J. et al**
Vereenigde Octrooibureaux Nieuwe Parklaan 107
NL-2587 BP 's-Gravenhage(NL)

(54) A collapsible tray with partition wall.

(57) Collapsible tray or like container formed from a blank and comprising a bottom wall (1), front (12), rear (14) and side walls (13,15) connected to said bottom panel (1) along fold lines (6-11), where in at each corner of said bottom wall (1) the opposed walls (12-15) are connected by a rectangular connecting flap (21) hinged (20) to one of the said walls (12-15) and a substantially isosceles-triangular connecting area (23) bounded by a substantially 45° fold line (22) in the other wall (12-15) meeting at said each corner of said bottom wall (1), said connecting flap (21) and said connecting area (23) are mutually fastened as by the use of adhesive or the like, in such a manner that in the collapsed state of the container the walls (12-15) are folded down on top of said bottom wall (1) with the triangular connecting areas (23) and the rectangular connecting flaps (21) located between adjacent wall panels (12-15; 1) said bottom wall (1) comprising parallel fold lines (3,4,5) bounding at least two bottom wall panels (1a,1b) and at least two intermediate wall panels (2a,2b) which are foldable in a face to face relation to form partition walls (2) that can be coupled to adjacent walls (12,14) and that can be folded down onto the bottom wall (1) when the container is to be brought in the collapsed state, said walls (12,14) being cut (16,17) so as to be shortened in a measure corresponding to the shortening of said bottom wall (1) due to the upfolding of said partition wall panels (2a,2b).

FIG. 7



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A collapsible tray with partition wall

This invention relates to a transport or display container in the form of a box made from a blank, said box being provided at least with a bottom wall and upright front, rear and side walls, in particular a folding box which, from a flat, folded storing position, wherein the respective upright walls are collapsed over the bottom wall, can be transformed into the position of use by erection of the collapsed walls.

Collapsible trays of this kind, an example of which is described in GB-A-971,272, are used frequently for packaging vegetables and fruits and also, in a lighter construction, for cakes, as transport and/or display box.

When an intermediate wall is desired in the interior of such collapsible trays, one has to use hitherto loose insert walls, which have to be positioned after the box has been brought in the position of use.

It is an object of the present invention to provide a collapsible tray of the above described type having at least one integrated intermediate wall.

To that end, the tray according to the present invention is provided with an intermediate wall panel formed by doubling up an intermediate wall panel portion and fixedly connected to the respective tray panel, said intermediate wall panel being collapsed over the bottom panel in the storing position of the transport box and when the tray is in the erected position of use, can be coupled to adjacent tray walls.

A collapsible tray of this kind with intermediate wall can be made using as the starting point a blank having a bottom wall panel which is connected through fold lines to front, rear and side wall panels, while in the corner areas, one of the converging wall panels is fitted with a substantially rectangular, hinging connecting flap and the other wall panel has a substantially 45° fold line which starts from the respective corner point of the bottom and which bounds a substantially isosceles-triangular connecting area adhesively connectible to the rectangular connecting flap in the area bounding the hinge line of said connecting flap, wherein according to the present invention, the bottom panel, for locally forming an intermediate wall, is provided with three parallel fold lines which bound two intermediate wall panels foldable upwards from the bottom surface, the respective wall panels being discontinuous adjacent the intermediate wall and the wall panel portions on either side of the discontinuity being interconnectible, thereby shortening the respective wall panels to an extent corresponding with the shortening of the bottom wall panel occurring as a result of the upfolding and face to face positioning of the intermediate wall panels.

For forming a collapsible tray from a blank, the front, rear and side walls are erected and interconnected in known manner at the corners of the bottom panel by means of the rectangular connecting flaps and the triangular connecting areas so that the wall panels are collapsible over the bottom panel and the intermediate wall is formed by the intermediate wall panels being folded up from the bottom panel and interconnected in a face to face relationship, while the ends of the upright wall portions located on either side of the local discontinuity are interconnected to form continuous walls. The resulting tray has collapsible upright walls and one or more intermediate walls collapsible onto the tray bottom.

For locking the intermediate wall, the side edges of said wall and the adjoining upright tray walls can be provided with coacting locking lips and lip-receiving cut-outs.

The upright wall portions on either side of the discontinuity near the or each intermediate wall may be provided with facing end portions interconnectible overlappingly for forming continuous upright walls.

In a preferred embodiment, one end portion of the facing end portions of the upright walls present on either side of each discontinuity near the end of an intermediate wall may be hinged to the respective wall portion and in said end portion, a connecting area may be bounded by a 45° fold line, said area being attachable to the intermediate wall so that similarly as near the corners of the collapsible tray, by erecting the collapsed wall, also the intermediate wall is pulled upwards from the flat position on the tray bottom (Fig. 9).

For the purpose of fitting the collapsible tray with a carrier grip, according to the present invention, the intermediate wall panels can each be extended by a hand grip or carrier grip panel so that, when the tray is erected, a hand grip projects above the tray. In order to use this tray with a lid, the hand grip can be turned down through 90°.

As an alternative of the embodiment wherein by erection of the upright box walls from the collapsed storing position towards the position of use, the intermediate wall is erected to the position of use as well, a further preferred embodiment is proposed requiring a smaller area in its collapsed position.

In this embodiment of a transport or display container in the form of a box or tray made from a blank, said box being provided at least with a bottom wall and upright front, rear and side walls,

in particular a folding box which, from a flat, folded storing position, wherein the respective upright walls are collapsed over bottom wall portions, can be transformed into the position of use by erection of the collapsed walls, according to the invention. The tray is provided with an intermediate wall panel formed by doubling up an intermediate bottom wall panel portion and hingedly connected to adjacent bottom wall panel portions, said intermediate wall being connected at its ends to each of the adjacent portions of the upstanding walls by means of hingedly arranged connecting flaps and connecting areas bounded by 45° hinge lines, such that the upright wall portions are collapsible over the relevant bottom wall portions while these bottom wall portions on both sides of the intermediate wall are simultaneously folded together thereby enclosing said intermediate wall.

It is observed that containers made from blanks and having an intermediate wall formed by bending upwards and doubling up the central portion of the bottom panel and coupling the resulting intermediate wall to adjoining upright side walls, are known per se. For example, US-A 4,362,262 describes a tray of this kind, wherein the intermediate panels of the bottom are provided with end flaps, which are placed in the erected tray against the upright side walls and, if desired, are glued thereto. Thus, a tray with a stable intermediate wall can be formed, however, not in the form of a collapsible tray.

US-A-3,721,380 describes a shallow, nestable tray of which an intermediate wall formed by doubling up an intermediate bottom portion is connected to the side walls in such a manner that the intermediate wall can be collapsed onto the bottom panel for nesting the trays.

GB-A-2,115,384 further discloses a tray having integral partitions wherein the partitions are formed by partly folding up intermediate bottom wall panels out of the plane of said wall, thereby forming roof-shaped projections with the purpose of forming a nestable tray, consequently no collapsible tray either but a tray fixedly formed in the position of use.

Some embodiments of the collapsible tray with intermediate wall will now be described, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 shows a first embodiment of a blank of the collapsible tray;

Figs. 2-4 show intermediate phases of the manufacture of the tray;

Fig. 5 shows the tray substantially in the storage or transport position;

Fig. 6 shows the tray in an intermediate step during the transformation of the tray to the position of use;

Fig. 7 shows the tray in the position of use;

Fig. 8 shows a blank of a collapsible tray in a variant embodiment;

Fig. 9 is a detail view of the connection of the intermediate wall with an upright wall in the variant embodiment shown in Fig. 8;

Fig. 10 shows a blank of a collapsible tray in a further variant embodiment, having a hand grip;

Figs. 11, 12 show the collapsible tray made from the blank shown in Fig. 10 in erected state, with the hand grip in the position of use or turned down through 90°;

Fig. 13 shows a blank of another embodiment of the collapsible tray with an intermediate wall; and

Figs. 14-16 show the collapsible tray made from the blank of Fig. 13, respectively in the position of use, partly collapsed and almost in the storing position.

As shown in Fig. 1, a blank for manufacturing a collapsible tray having a partition, is provided with a two-part bottom panel whose portions 1a, 1b are separated by intermediate wall panels 2a,2b. The respective panels are connected by fold lines 3,4,5.

The bottom panels 1a, 1b are further connected by fold lines 6-11 to upright wall panels 12-15, whose panels 12,14 likewise have a two-part design. The respective portions 12a,12b; 14a,14b are separated by a discontinuity 16,17. The end portions of panel portions 12a,12b,14a,14b on either side of discontinuities 16,17 are indicated at 12a′, 12b′, 14a′ and 14b′.

Besides, locking lips 18 are indicated at the intermediate panels 2a,2b and in panels 12, 14 are shown cavities 19 for receiving the locking lips 18.

For the corner connections conventional in collapsible trays, panels 13,15 are provided at their ends with connecting flaps 21 connected thereto through fold lines 20 and the adjoining portions of panels 12,14 are provided with connecting areas 23 connected thereto by 45° fold lines. It is clear that the connecting areas 23 bounded by a 45° fold line can also be formed in the connecting flaps.

Fig. 2 shows the first phase of the tray formation, wherein the intermediate wall portions 2a, 2b are folded upwards and are kept pressed against one another by overlapping attachment of the end portions 12a′, 12b′, and 14a′ and 14b′, respectively, of the upright wall panel portions 12a, 12b, and 14a, 14b, respectively.

Fig. 3 then shows the intermediate wall 2 folded down onto the plane of the bottom panels 1a, 1b.

Fig. 4 shows the next phase with the upright side walls 12, 14 collapsed onto the bottom 1, with the triangular connecting area portions 23 being folded back.

In the situation shown in Fig. 5, the walls 13,15 are folded down with attachment flaps 21 pre-

viously folded inwards, while the triangular connecting areas 23 are glued to the opposite portions of the connecting flaps 21, after which the tray is ready and in the transport position.

For transforming the tray into the position of use, walls 13,15 are erected, while likewise walls 12,14 are set up by means of connections 21,23. This is shown in Fig. 6. Fig. 7 shows the position of use with intermediate wall 2a placed upright between the walls and locked by lips 18 in the opposite cavities 14. This erection of intermediate wall 2a,b should be effected separately by hand.

The variant embodiment shown in Figs. 8, 9 is distinct from the embodiment shown in Figs. 1-7 in that intermediate wall 2a, b need not be set upright by hand but is raised automatically during the erection of walls 12, 14.

While (see the blank in Fig. 8) the end portions 12b′ and 14b′ are designed similarly as in the embodiment shown in Figs. 1-7, end portions 12a′ and 14a′ are connected to the respective panel portions through a hinge line 24 and there is provided a fold line 25 bounding a triangular connecting area 26. Said connecting areas are adhered to the intermediate wall panel 2a in a tray forming phase corresponding to that shown in Fig. 5. Consequently, during erection of walls 12, 14, intermediate wall 2a, b will be pulled upwards, similarly as at the angular points. The fixation of the intermediate panel can be effected with the locking lips 18 and the cavities 19. The intermediate wall can also be locked in the horizontal state by lips 18 and additional cavities 27.

The tray variant shown in Figs. 10-12, between intermediate wall panels 2a, 2b, has hand grip panels 28a, 28b connected by hinge lines 27 to the intermediate wall panels and interconnected by a hinge line 29. The hand grip panels 28a, 29b contain openings 30 forming a carrier opening in panels 28a, 28b (see Figs. 11, 12) combined to a hand grip 28.

Hand grip 28, in the position of use of the tray, can be turned down through 90° in the plane of the upper edges of the collapsible tray (see Fig. 12) in order to enable the tray with hand grip to be closed by a lid (not shown).

The blank of Fig. 13 is distinct from the blank of Fig. 1 in that the central part has different features. The upright wall panels 12a, 12b; 14a, 14b terminate near the bottom fold lines 3 and 4 and they are provided with 45° fold lines 22 bounding substantially isosceles-triangular connecting areas 31. The intermediate wall panels 2a, 2b are provided with rectangular connecting flaps 32 connected thereto by hinge lines 33. Said connecting flaps are adhesively connectable to the adjacent triangular connecting areas (see Fig. 14).

A collapsible tray made from this blank is shown in Fig. 14 in its position of use. To transfer the tray to the almost collapsed position shown in Fig. 16, the bottom wall panels 1a and 1b are folded together simultaneously with collapsing the upright walls 12-15. This phase is shown in Fig. 15. In the collapsed storing position the intermediate wall 2 is enclosed between the bottom panels. The total area is about half the bottom area.

It is clear that various variants are conceivable within the scope of the present invention. For instance, an intermediate wall can be formed by intermediate panels folded from the plane of either of two opposite, upright walls. Besides, use can be made, for stabilizing the tray in the position of use, of contact adhesive areas abutting in the transport position against areas that have been treated with an adhesive-repellent agent, however, in the position of use, adhere to opposite tray areas. An integrated partition according to the present invention provides an additional reinforcement when nesting filled trays.

Claims

1. A transport or display container in the form of a box made from a blank, said box being provided at least with a bottom wall (1a,1b) and upright front (12), rear (14) and side walls (13,15) in particular a folding box which, from a flat, folded storing position, wherein the respective upright walls (12-15) are collapsed over the bottom wall (1a,1b), can be transformed into the position of use by erection of the collapsed walls, characterized in that the tray is provided with an intermediate wall panel (2) formed by doubling up an intermediate wall panel portion (2a,2b) and fixedly connected to the respective tray panel, said intermediate wall panel being collapsed over the bottom panel (1) in the storing position of the transport box and when the tray is in the erected position of use, can be coupled to adjacent tray walls (12,14).

2. A blank for manufacturing a collapsible tray as claimed in claim 1, comprising a bottom wall panel (1a,1b), which is connected through fold lines (6-11) to front, rear and side wall panels (12-15) while in the corner areas, one of the converging wall panels is fitted with a substantially rectangular, hinging connecting flap (21) and the other wall panel has a substantially 45° fold line (22), which starts from the respective corner point of the bottom and which bounds a substantially isosceles-triangular connecting area (23) being adhesively connectible to the rectangular connecting flap (21) in the area bounding the hinge line (20) of said connecting flap (21), characterized in that for locally forming an intermediate wall (2) the bottom panel (1a,1b) is provided with three parallel fold

lines (3,4,5) which bound two intermediate wall panels (2a,2b) foldable upwards from the bottom surface, said wall panels (12,14) on either side of the discontinuity (16,17) being interconnectible thereby shortening the respective wall panels (12,14) to an extent corresponding with the shortening of the bottom wall panel (1a,1b) occurring as a result of the upfolding and face to face positioning of the intermediate wall panels (2a,2b).

3. A blank as claimed in claim 2, characterized in that the side edges of the intermediate wall (2a,b) and the adjoining upright tray walls (12,14) can be provided with coacting locking lips (18) and lip-receiving cut-outs (19).

4. A blank as claimed in claim 2 or 3, characterized in that the upright wall portions (12,14) on either side of the discontinuity (16,17) near the or each intermediate wall (2a,b) may be provided with facing end portions (12a′, 12b′; 14a′, 14b′) interconnectible overlappingly for forming continuous upright walls (12a,b; 14a,b).

5. A blank as claimed in any one of claims 2-4, characterized in that one end portion (12a′,14a′) of the facing end portions (12a′,12b′; 14a′,14b′) of the upright walls (12,14) located on either side of each discontinuity (16,17) near the end of an intermediate wall (2a,b) is hinged (24) to the respective wall portion (12a,14a), while in said end portion (12a′, 14a′) a connecting area (26) is bounded by a 45° fold line (25), said area being attachable to the intermediate wall (2a,b) so that similarly as near the corners of the collapsible tray, by erection of the collapsed walls (12,14), also the intermediate wall (2a,b) is lifted from the flat position on the tray bottom.

6. A blank as claimed in any one of claims 2-5, characterized in that the intermediate wall panels (2a,2b) are interconnected through hand grip panels (28a,28b), which are connected to the respective intermediate panels (2a,2b) through fold lines (27) and are interconnected through a fold line (29).

7. A transport or display container in the form of a box or tray made from a blank, said box being provided at least with a bottom wall (1a,1b) and upright front (12), rear (14) and side walls (13, 15), in particular a folding box which, from a flat, folded storing position, wherein the respective upright walls (12-15) are collapsed over bottom wall portions (1a, 1b), can be transformed into the position of use by erection of the collapsed walls, characterized in that the tray is provided with an intermediate wall panel (2) formed by doubling up an intermediate bottom wall panel portion (2a, 2b) and hingedly connected to adjacent bottom wall panel portions (la, lb), said intermediate wall (2) being connected at its ends to each of the adjacent portions (12a, 12b; 14a, 14b) of the upstanding walls (12, 14), by means of hingedly arranged connecting flaps (32) and connecting areas (31) bounded by 45° hinge lines (22), such that the upright wall portions (12-15) are collapsible over the relevant bottom wall portions (1a, 1b) while these bottom wall portions on both sides of the intermediate wall (2) are simultaneously folded together thereby enclosing said intermediate wall (2).

8. A blank for manufacturing a collapsible tray as claimed in claim 7, comprising a bottom wall panel (1a, 1b), which is connected through fold lines (6-11) to front, rear and side wall panels (12-15) while in the corner areas, one of the converging wall panels is fitted with a substantially rectangular, hinging connecting flap (21) and the other wall panel has a substantially 45° fold line (22), which starts from the respective corner point of the bottom and which bounds a substantially isosceles-triangular connecting area (23) being adhesively connectible to the rectangular connecting flap (21) in the area bounding the hinge line (20) of said connecting flap (21), characterized in that for locally forming an intermediate wall (2) the bottom panel (1a, 1b) is provided with three parallel fold lines (3, 4, 5) which bound two intermediate wall panels (2a, 2b) foldable upwards from the bottom surface, said wall panels (12, 14) terminate on either side of the intermediate wall panels (2a, 2b) and are provided with substantially isosceles-triangular connecting areas (31), said intermediate wall panels (2a, 2b) being provided with hingedly arranged connecting flaps (32), adhesively connectable to the adjacent connecting areas.

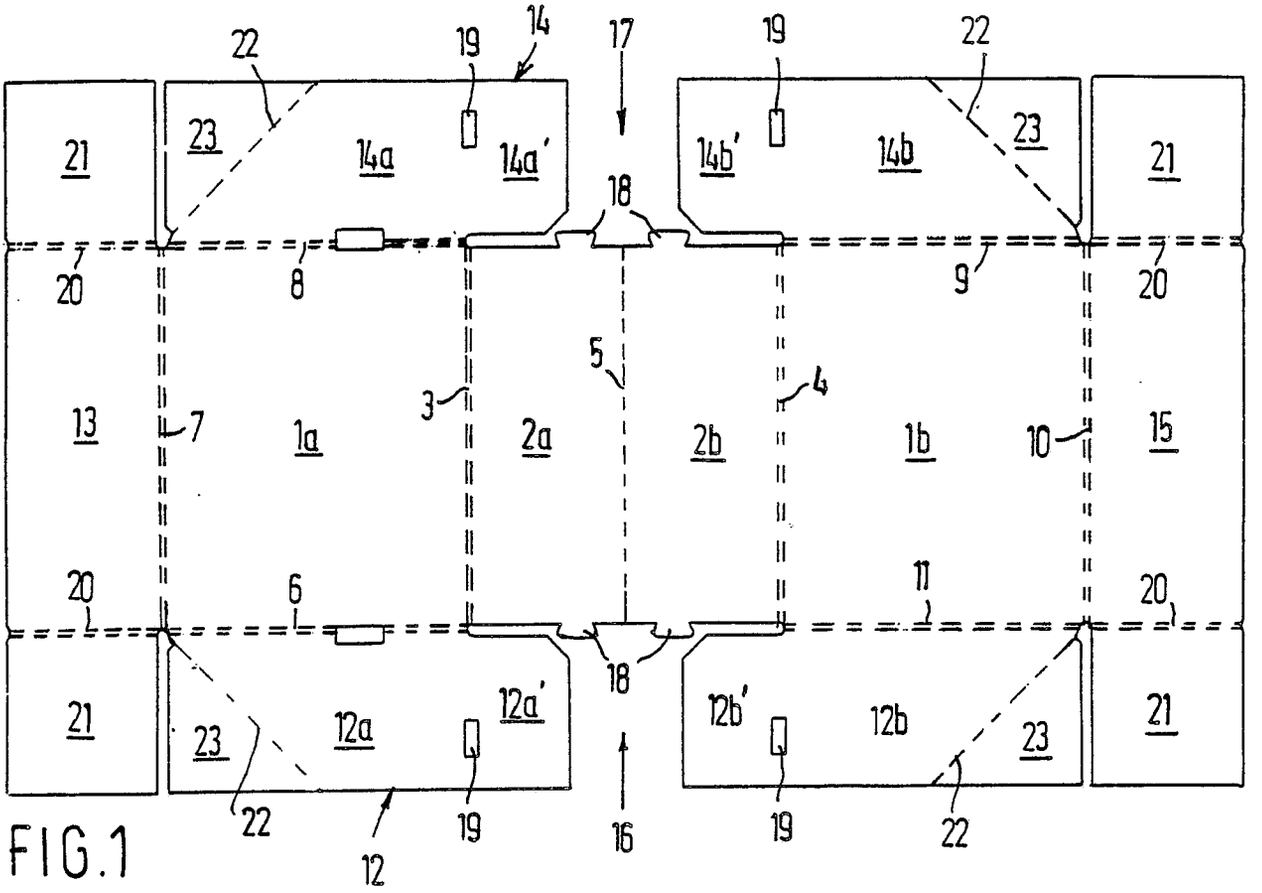

14
17
19
22
21
23
14a
14a'
14b'
14b
18
20
8
9
5
3
4
13
7
1a
2a
2b
1b
10
15
6
11
12a
12a'
12b'
12b
16
12

FIG.1

FIG.8

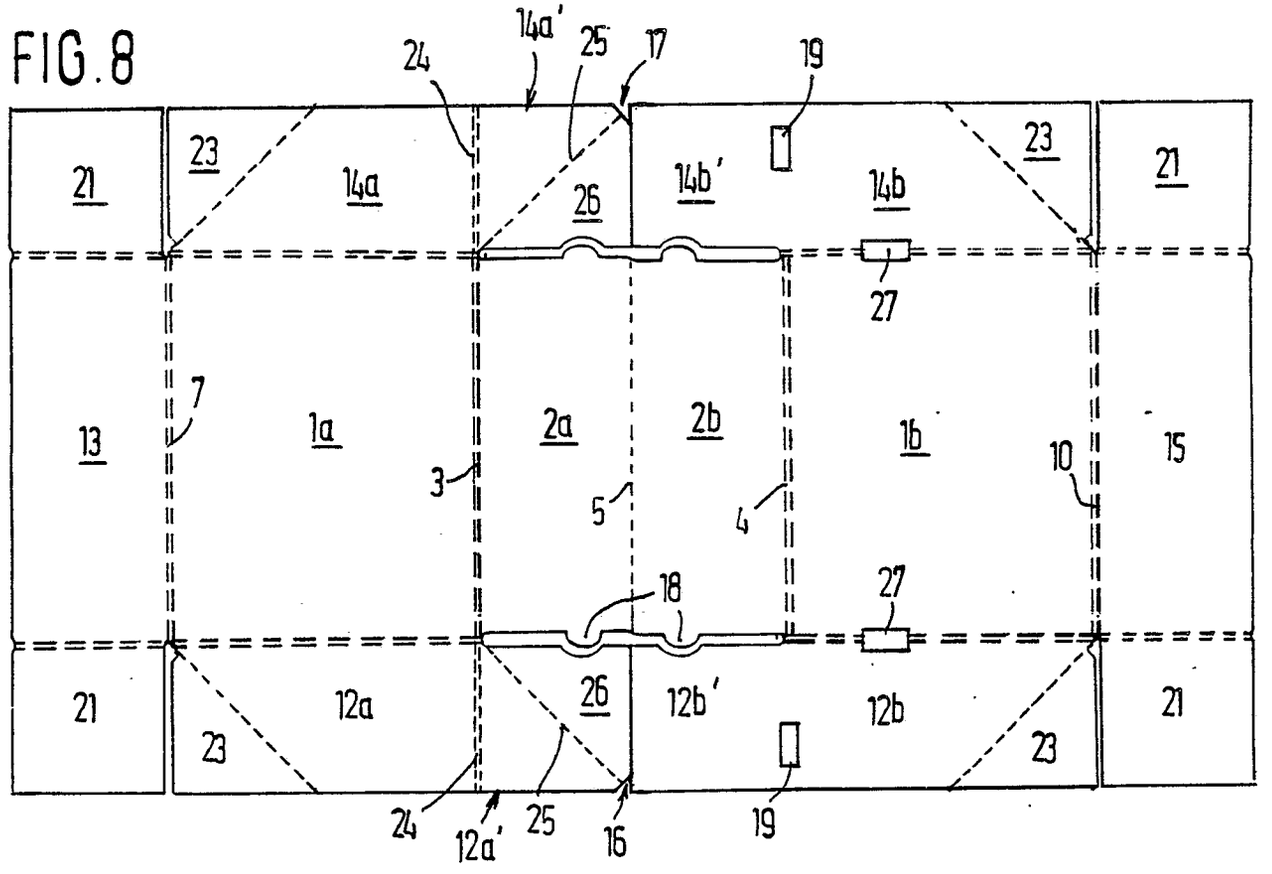

14a'
24
25
17
19
21
23
14a
26
14b'
14b
27
13
7
1a
2a
2b
1b
10
15
3
5
4
18
12a
12b'
12b
16

FIG.2

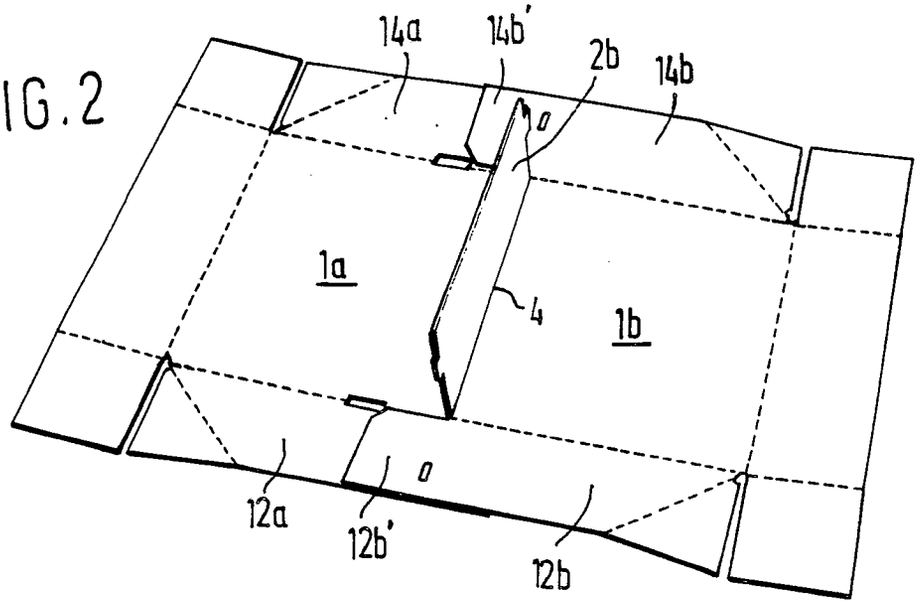


FIG.3

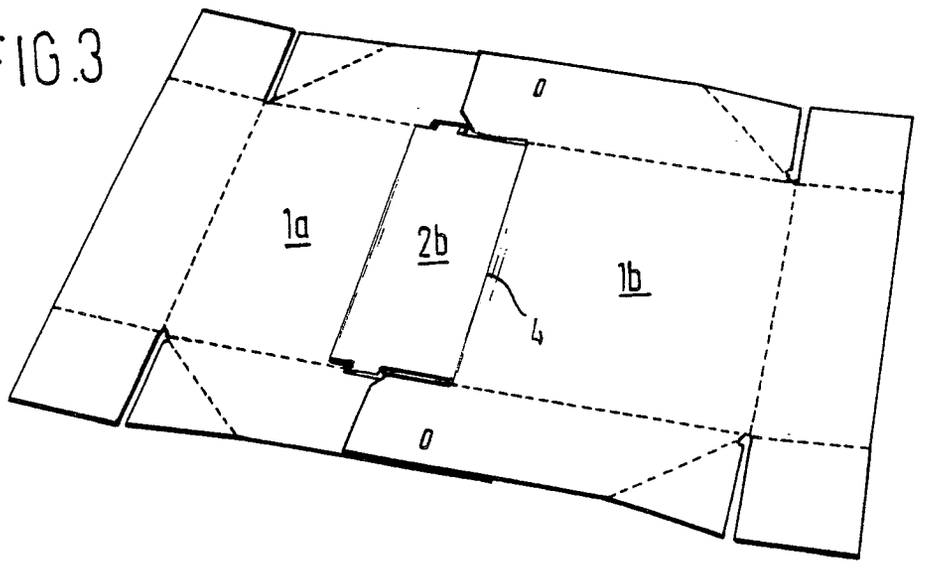


FIG.4

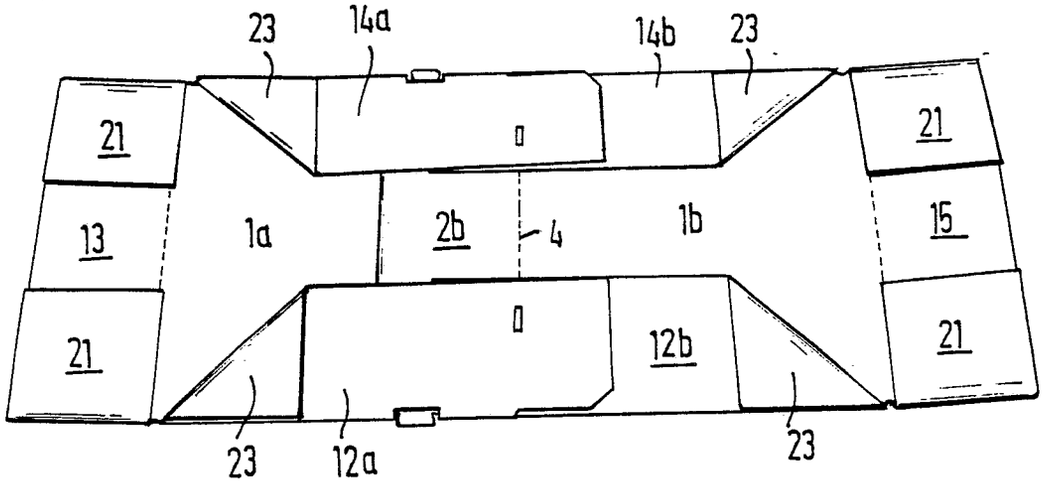


FIG.5

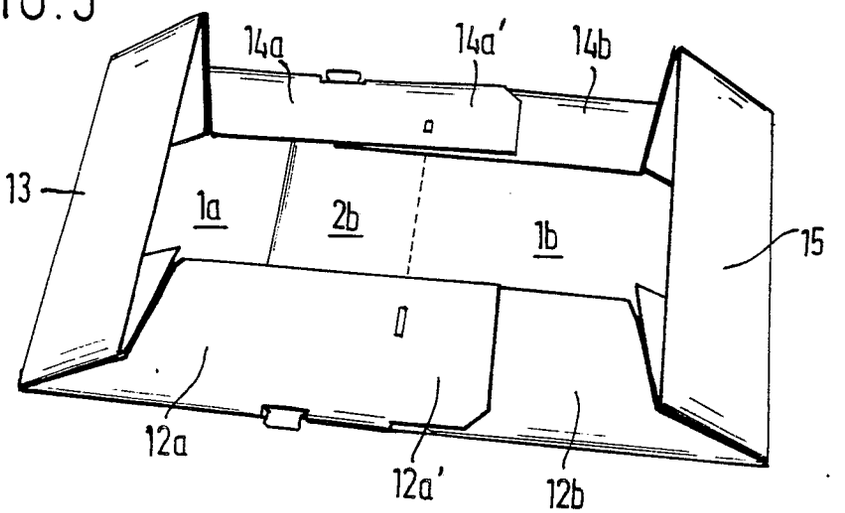


FIG.6

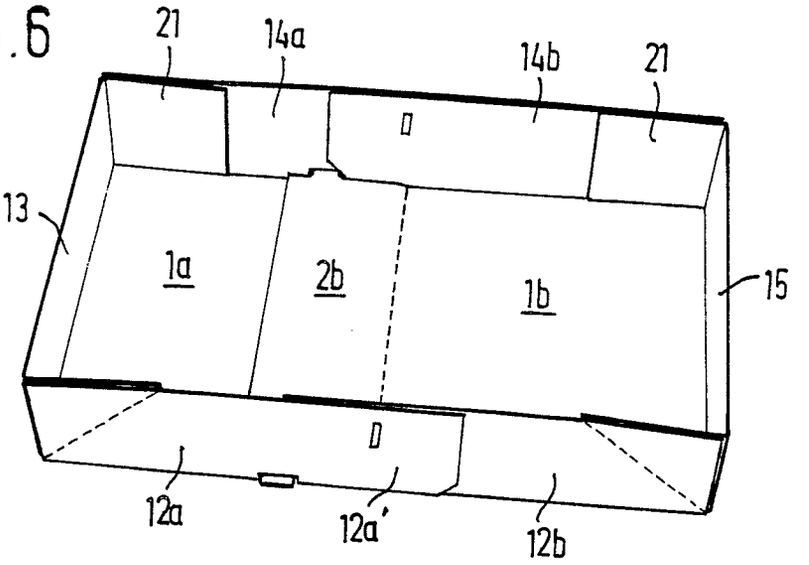


FIG.7

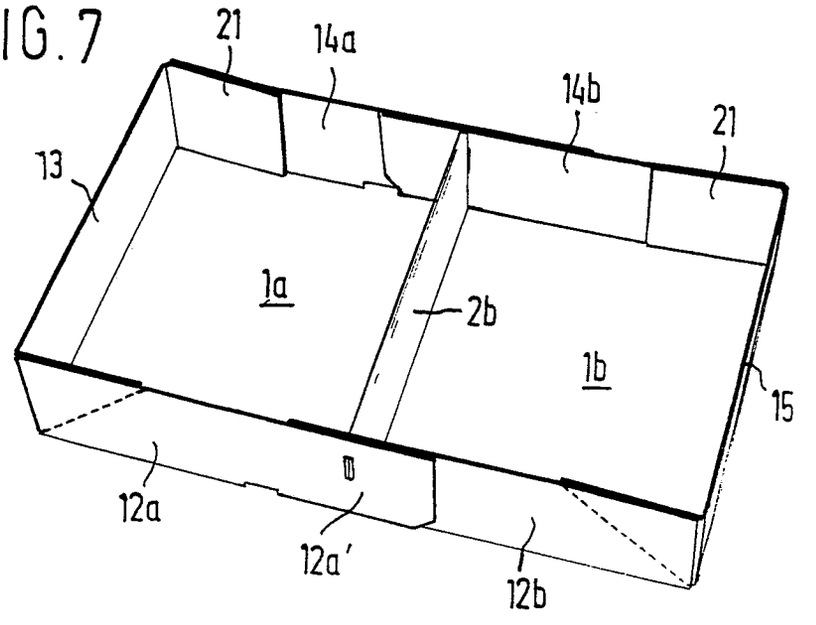
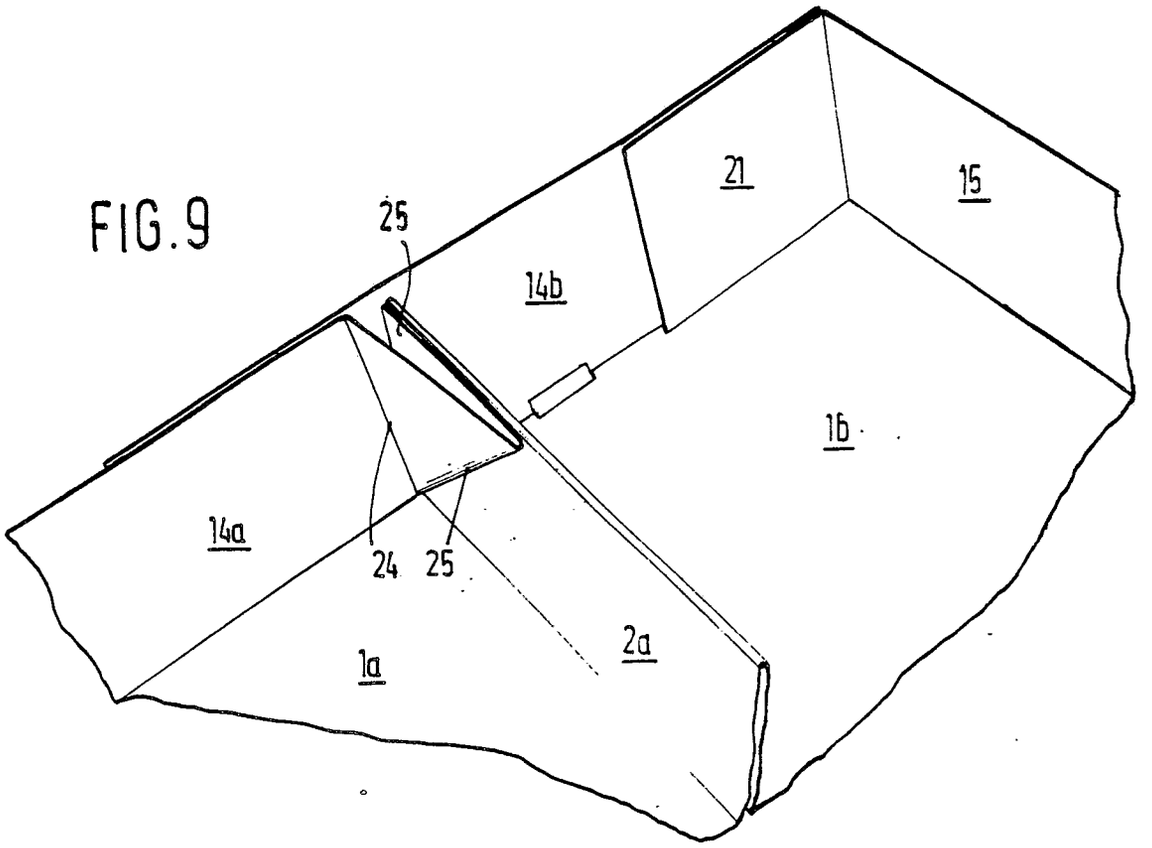


FIG.9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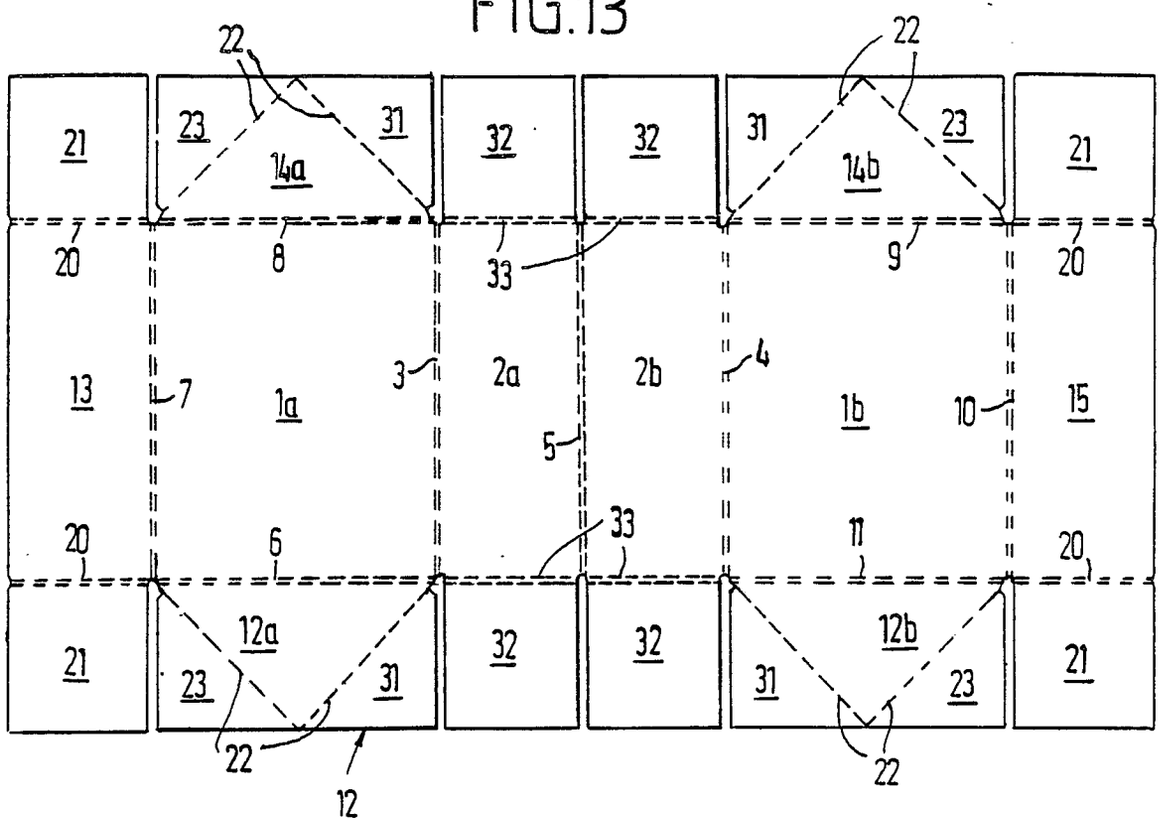
15
25
14b
16
14a
24
25
2a
1a

FIG.13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2b
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1b
10
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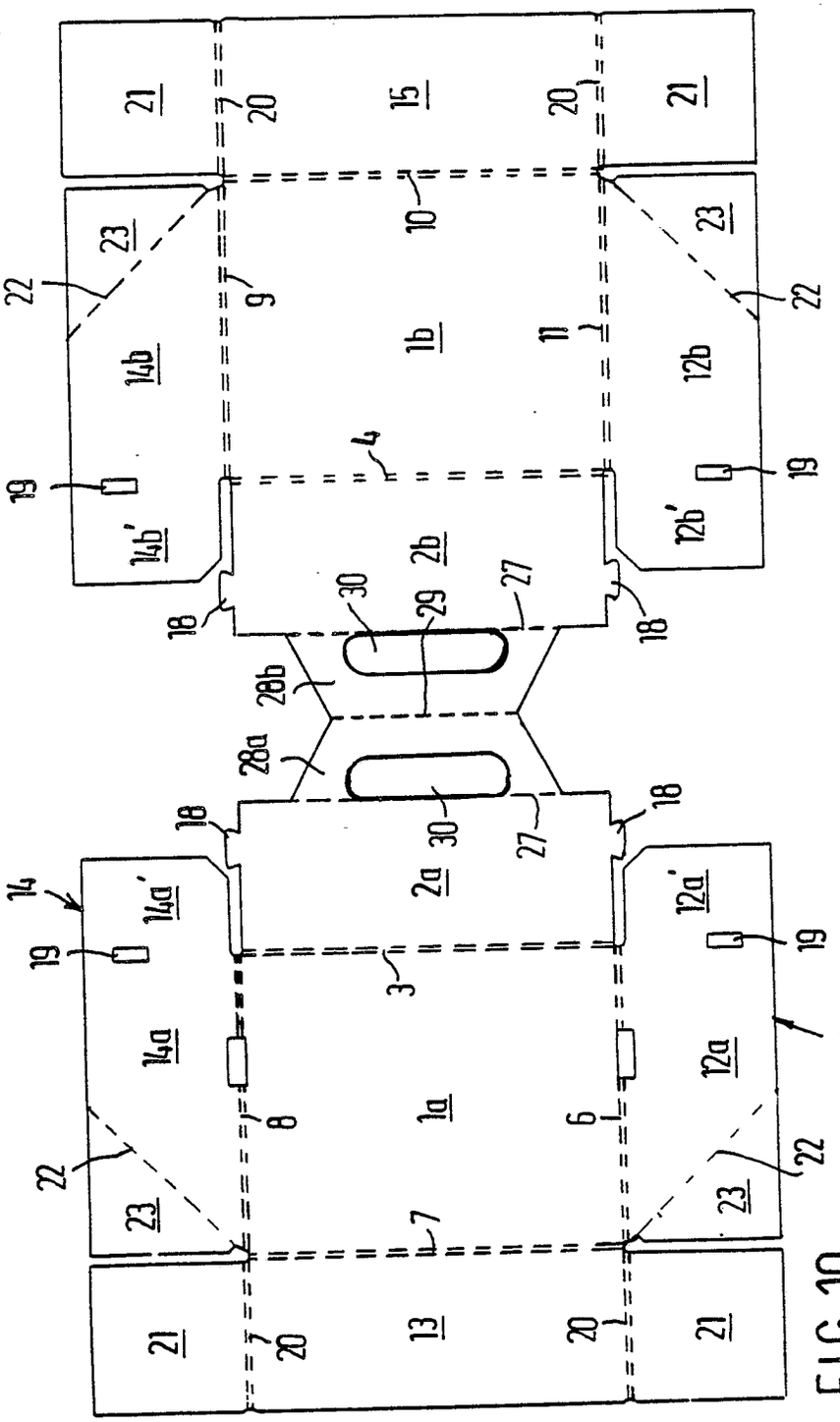
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22
9
22
14b
1b
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12b
14b'
4
12b'
19
19
18
2b
27
18
30
29
28b
28a
18
30
27
18
2a
14
14a'
12a'
19
19
3
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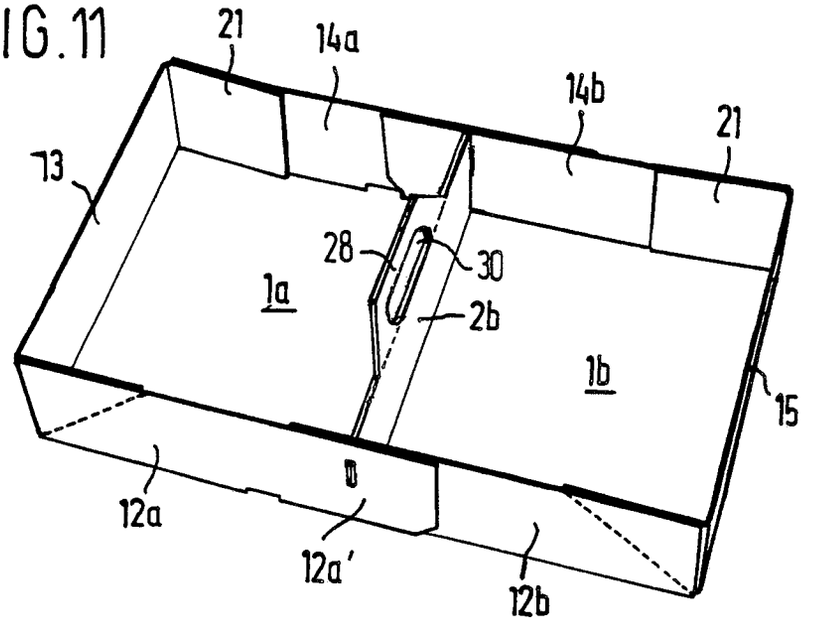
20
21

FIG.10

FIG.11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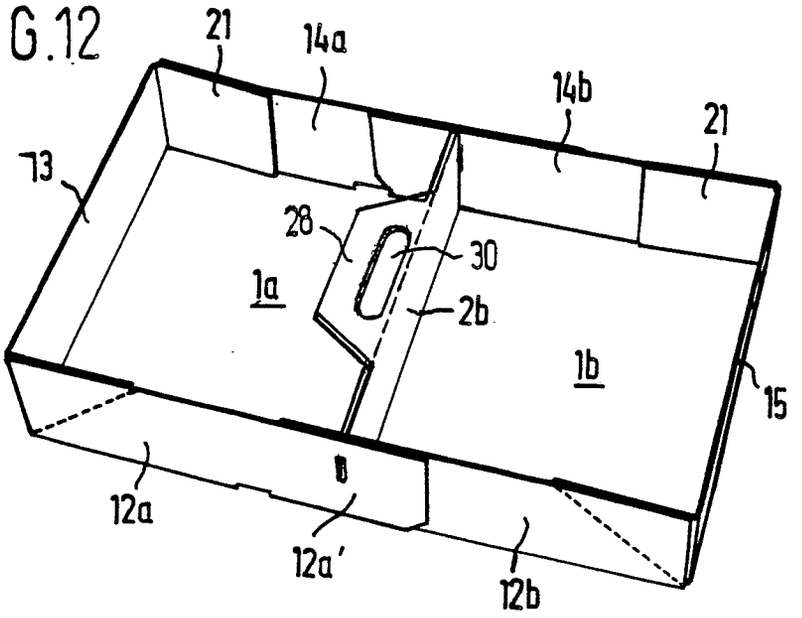
1a
2b
1b
15
12a
12a'
12b

FIG.12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14b
21
13
28
30
1a
2b
1b
15
12a
12a'
12b

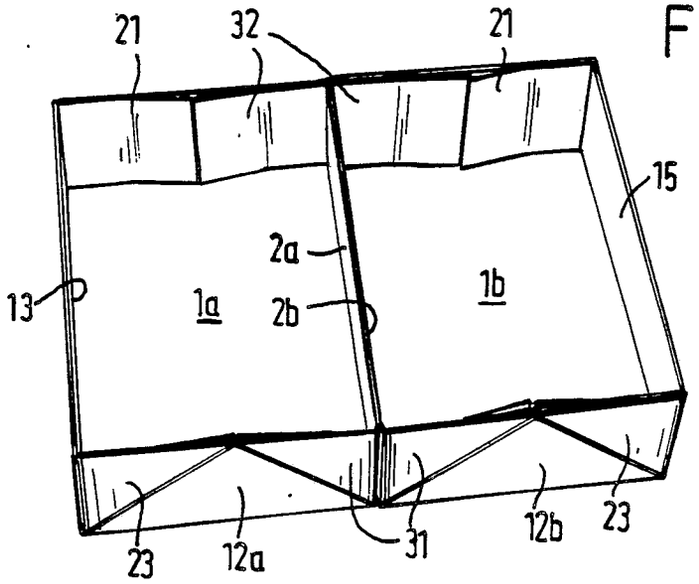

FIG.14

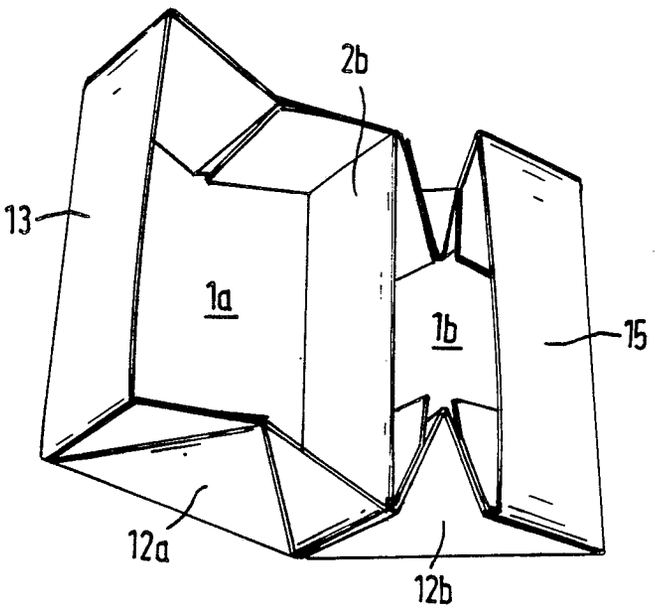

FIG.15

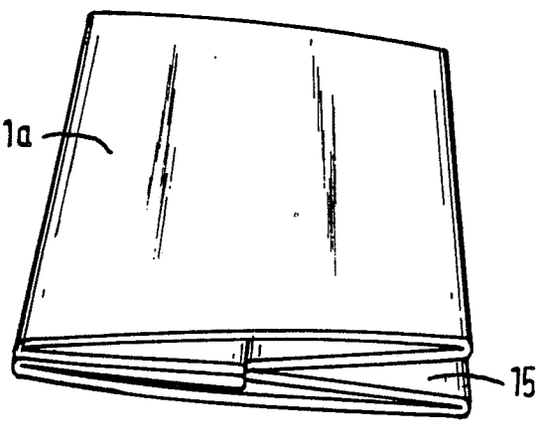

FIG.16

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 20 1630

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)
D,A	GB-A- 971 272 (WALMSLEY LTD) * Figures *	1,2	B 65 D 5/48 B 65 D 5/36
D,A	US-A-4 362 264 (DUNCAN) * Column 5, lines 6-37; figures 10-12 *	1,2,4,7,8	
A	NL-A-7 205 527 (ITT INDUSTRIES) * Figures 1a-b * & DE-A-2 220 021	1,2	
D,A	US-A-3 721 380 (MEYERS) * Column 2, line 59 - column 4, line 43; figures 1-5 *	1,2,4	
A	FR-A-2 145 837 (CARTONNERIES D'AUVERGNE) * Figure 1 *	1,6	
A	US-A-2 850 223 (STRAUSS)		
D,A	GB-A-2 115 384 (BOXFOLDIA)		

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	03-11-1988	MARTENS L.G.R.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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