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(54) **FOLDABLE CONTAINER AND METHOD FOR FORMING.**

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EP 0 216 763 B1

Description

I. Technical Field

This invention relates generally to foldable containers according to the preamble of claim 1 (known from US-A-4056233) and more particularly to a foldable container having a reinforced internal construction as well as to a method of forming such a container from a blank according to the preamble of claim 12.

II. Background Art

Fresh meat is typically packaged in containers to protect the meat during transportation thereof and while in storage. These containers may be individually stacked on top of each other during shipment and/or in pallet loads during storage. Thus, the stacking strength of these containers is critical to prevent collapse while the containers are being transprted or stored especially under refrigerating conditions.

Industry practice has dictated that the container have a rectangular shape to contain the meat and a solid bottom to reduce the likelihood of contaminates entering the interior of the container through any bottom seals. As a result single piece regular slotted corrugated containers where the flutes are vertical in all end and side walls are typically not used in this application. In order to have single piece corrugated containers with a solid bottom, the flutes in one pair of walls run horizontal and vertical in the other pair of walls. Typically, the flutes are horizontal or lengthwise of the side walls. In order to have solid bottom corrugated containers with the flutes running vertical in all walls, multi-piece constructions have been used. This construction is typically in the form of a three piece modified Bliss style container.

The criterion which determines the ability of a container to meet the needs of the industry is the cross stacking strength thereof since such containers are typically cross stacked for stability and the cross stacking strength is always less than the single aligned stack strength of the container.

Multiple piece containers are usually more expensive to use than single piece containers and are typically used only when single piece containers cannot meet the minimum cross stacking strength requirements. Cross stacking strength can be expressed as a percentage of single containers compressive strength (corresponds to a single aligned stack strength). While posts have been incorpo'rated in multiple piece containers, such as the three piece Bliss style container, such posts and their location have not been able to significantly raise the percentage of the cross stacking strength relative to the single strength of the container. Thus, these prior art container constructions would not suggest the use of posts in single piece containers to raise the percentage of the cross stacking strength relative to the single strength thereof.

An example of a prior art single piece container is illustrated in US Patent 4056223.

This Patent describes a container formed from a single blank of foldable sheet material comprising:

a bottom panel having opposed sides and opposed ends;

opposed end and side panels joined to said bottom panel respectively along the opposed ends and sides thereof, said end panels and side panels being erected to an upright position and forming corners therebetween and defining an open top material receiving cavity therein, said end panels having opposed ends along said corners; and

a first pair of column forming members joined to one of said end panels at the opposite ends thereof, each of said column forming members including, a first section joined to the end of said end panel and projecting along the inside of said side panel at the corner toward the opposite end panel, and being secured to said side panel, and a second section joined to the projecting end of said first section.

Such a container will hereinafter be called a container of the type referred.

The columns formed by the column forming members are located in the corners of the container between respective adjacent side and end panels. These do not provide suitable cross-stacking strength.

Accordingly there is provided a container of the kind referred characterised by each second section of the column forming members being formed into a tubular column projecting interiorly of said side panel and which is located at a distance from said one end panel.

Also according to invention there is provided a method of forming the aforementioned container from a blank comprising a bottom panel, opposed end panels and opposed side panels foldably connected to the bottom panel along respective fold lines, and corner connecting members foldably connected to opposite ends of each of the end panels, said method comprising the steps of:

a) applying adhesive to interior surface areas of the corner connecting members and end panels,

b) folding the corner connecting members upon themselves so that end portions thereof can overlap the end panels,

c) folding the end panels and associated corner connecting members approximately 90 degrees so that the corner connecting members extend along the fold lines between the bottom panel and side walls, and

d) folding the side walls into face contacting relationship with the corner connecting members with an adhesive therebetween to secure the side walls to the connecting members, characterised in that after step b) but prior to step c), the end portions of the corner connecting members are maintained out of contact with the adhesive applied to the end panels while folding the connecting members up to a position generally normal to the end panels; and the end portions of the corner connecting members are then contacted with the adhesive on the end panels to secure said end portions thereto.

IV. Brief Description of the Drawings

Fig. 1 is a perspective view of a first embodiment of the invention partly broken away to show the internal construction thereof;

Fig. 2 is a plan view of a blank used to make the container of Fig. 1;

Fig. 3 is a schematic diagram illustrating the steps in erecting the container of Fig. 1;

Fig. 4 is a perspective view illustrating a second embodiment of the invention with portions thereof broken away to show the internal construction thereof;

Fig. 5 is a plan view of a blank used to fabricate the container of Fig. 4; and

Fig. 6 is a schematic diagram illustrating the erection steps to erect the container of Fig. 4.

V. Detailed Description of Illustrative Embodiments

The container of the invention is designed primarily for packaging of primal and subprimal cuts of meat for shipment from the meat packager to the retailer. Such cuts are typically film wrapped so that the container is not exposed to the moisture in the meat itself. Where the container is used with unwrapped meat cuts, it is appropriately coated with a water barrier to reduce the deterioration of the container from the moisture in the meat. It will also be appreciated that modified constructions of the container may be used for the shipment of ice pack meats such as poultry.

Fig. 1 shows a first embodiment of the container which has been designated 10 and which is erected from a single blank 11 of sheet material. The typical sheet material is double-faced corrugated fibreboard, however, it is to be understood that solid fibreboard sheets may be used. The blank 11 may be formed by conventional blank forming equipment which automatically slots, slits and scores the blank 11.

The blank 11 includes a rectilinear bottom panel 15 with opposed ends and opposed sides. A pair of side panels 16 are foldably joined to the bottom panel 15 along the opposite sides thereof at side fold lines 18 while end panels 19 are foldably joined at opposite ends of the bottom panel 15 along end fold lines 20. The side panels 16 have a length corresponding to the length of the bottom panel 15 while the end panels 19 have a length corresponding to the width of the bottom panel 15. The side and end panels 16 and 19 have a common height for apparent reasons, A top flap 21 is foldably joined to each of the side panels 16 at the projecting edge thereof along a top fold line 22. The top flaps 21 have transverse width greater than half the transverse width of the bottom panel 15 so that the top flaps 21 will overlap each other when the container is erected and the top flaps closed as will become more apparent. Where the blank 11 is formed from double-faced corrugated fibreboard, the flutes F are typically arranged so that they run longitudinally of the bottom panel 15. Thus, when the side panels 16 and end panels 19 are erected by folding them about the respective fold lines 18 and 20, the flutes in the end panels will run along the height of the panels perpendicular of the bottom panel while the flutes in the side panels will run lengthwise of the side panels parallel to the bottom panel.

A corner connecting member 25 is integral with each side edge of each end panel 19 along fold line 26 oriented normal to fold line 20. The corner connecting member 25 is separated from the side panel 16 and top flap 21 by a cut 28. The cut 28 also forms a sealing tab 29 on the end of top flap 21 along the perforated fold line 30. This, of course, forms a cutout in the corner connecting member 25. The height of the corner connecting member 25 corresponds to the height of end panel 19 and its length corresponds to the combined height of side panel 16 and the transverse width of top flap 21 so that the projecting end edge 31 of connecting member 25 is aligned with the projecting side edge 34 of the top flap 21, This serves to maximize raw material utilization.

The corner connecting member 25 includes a base section 35, a column section 36, a return section 38 and an end overlap section 39. The base section 35 is foldably connected to the end panel 19 and projects outwardly therefrom for the distance d_1 to fold line 30 parallel to fold line 26. The column section 36 is foldably connected to the base section 35 along fold line 40. The column section 36 has a first portion 41 connected to section 35 along fold line 40 and a second portion 42 foldably joined to the first portion 41 along fold line 44 parallel to fold line 40, portions 41 and 42 have transverse widths WP_1 and WP_2 and a common height H_p corresponding to the inside height of the container. The return section 38 is foldably connected to the edge of portion 42 of column section 36 along reverse fold line 45 parallel to fold line 44. It will be seen that the fold line 45 is aligned with one edge of cutout 31 although its position relative to cutout 31 may vary as the container dimensions vary. The end overlap section 39 is joined to the end of the return section 38 along reverse fold line 46 also parallel to fold line 45. Fold line 46 is located at the other end of the cutout 31 although its location may vary with different container dimensions.

The erection of the blank 11 into the container 10 is illustrated in Fig. 3. Fig. 3 shows the blank 11 at the various stages of the erection process immediately after each erection step. For simplicity, the erection stages of the blank 11 have been labelled A-F. Fig. 3 also shows two additional diagrams to illustrate the top flaps being closed, however, these diagrams are for illustration only since the erected container 10 is typically not closed and sealed until after it is loaded.

Stage A shows the interior side of blank 11 after the adhesive has been applied to maintain the container 10 erected. For clarity, the adhesive AD has been shown only in Fig. 2 and not in Fig. 3. The adhesive AD is applied to that portion of the base section 35 of each corner connecting member 25 which the return section 38 of the member 25 will overlie. Adhesive AD is applied to

those portions of end panels 19 which the end overlap sections 39 will overlie. Adhesive AD is also applied to those portions of the side panels 16 which the base sections 35 of the corner connecting members 25 will overlie.

Stage B shows the blank 11 after the corner connecting members 25 have been folded inwardly about the fold lines 40 so that the column, return and end overlapping sections are normal to the plane of blank 11 while the base section thereof remains coplanar therewith. Stage C shows the blank 11 after the column sections 36 of the corner connecting members 25 have been folded inwardly along the fold lines 40 and the second portion 42 folded inwardly with respect to the first portions 41 about fold line 44 so that the portions 41 and 42 overlie the base section 35 and angle away from section 35 to form an apex 48 along fold line 44. The return section 38 is folded outwardly with respect to the second portion 42 of post section 36 along the fold line 45 and the end overlap section 39 is folded outwardly with respect to the return section 38 about fold line 46 until the end overlap section 39 is normal to return section 38. The return section 38 is located so that the edge formed between return section 38 and end overlap section 39 along fold line 46 is in registration with fold line 26 between the end panel 19 and the base section 35 of the corner connecting member 25. The return section 38 is then pressed against the adhesive AD on the base section 35 to adhesively attach sections 35 and 38 together and maintain the column section 36 in an erected condition.

At the same time, the end overlap sections 39 are held up off of the adhesive AD on the end panels 19 as illustrated at Stage C. The glued corner connecting members 25 are then folded inwardly about fold lines 26 so that the base sections 35 of members 25 are normal to the end panels 19. The end overlap sections 39 are then pressed down onto the adhesive AD on the end panels 19 to secure them to the end panels 19. The blank 11 is shown in this condition at Stage D. It will likewise be understood that the adhesive on the end panels 19 can be omitted. This permits the end overlap sections 39 to lie against the end panels 19 during the folding operation in Stages C and D.

With the corner connecting members 25 thus attached, the end panels 19 with the corner connecting members 25 attached thereto are folded up about the fold lines 20 until the end panels 19 are oriented generally normal to the bottom panel 15. This places the corner connecting members 25 so that the base sections 35 thereof lie along the fold lines 18 where the side panels 16 are joined to the bottom panel 15. This is illustrated in Stage E.

Thereafter, the side panels 16 are folded up about the fold lines 18 and then pressed up about the fold lines 18 and then pressed against the base sections 35 of the members 25 to cause the adhesive AD on the side panels 16 to secure the base sections 35 of the members 25 to the side panels 16. This is shown in Stage F and completes the erection of the container 10. Subsequently, the container 10 is loaded while the flaps 21 are still open and then the flaps 21 folded over and the sealing tabs 29 secured to the end panels 19. Also, the overlapped top flaps 21 are typically adhesively joined in their overlapped portions.

The dimensions of the bottom side and end panels 15, 16 and 19 are selected so that the erected container 10 as seen in Fig. 1 has a width W_c less than its length L_c. Typically, the width W_c is some fraction of the length L_c so that the containers will cross stack into a typical pallet load with the overall dimensions of the layers matching. The container 10 illustrated has a width W_c about two-thirds the length L_c so that three containers turned endwise line up with two containers turned lengthwise to permit five container layers with a reversing pattern whereby the layers interlock. Thus, when two containers 10 are cross stacked with a side panel 16 on one container lined up with an end panel 19 on the other container and with an end panel 19 on the one container lined up with a side panel 16 on the other container, the remaining side panel 16 on each container will cross over the other container at a cross over distance d_{co} from the aligned end panel 19 of each corresponding to width W_c of the container 10.

Each erected column section 36 is located in the vicinity of the cross over points where the side walls 16 of each cross stacked container cross over the side walls of the other container. Preferably, of course, the apex 48 of the column sections 36 are located the distance d_{co} from the opposite end panel 19. Good results have been obtained where the apex 48 is located within about an inch of the distance d_{co}. Where this is the case, the container cross stacked thereon will typically overlie some portion of the column section 36.

Prior experience has indicated that the cross stacking strength of a container is about 55% or less of its single column strength. The container 10 is able to maintain a cross stacking strength of about 70% or more of its single column strength under high humidity conditions typically found in refrigerated food storage facilities. As a result, the least expensive raw material in the least amounts can be used to obtain satisfactory results.

Fig. 4 shows a second embodiment of the invention which has been designated 110 and which is erected from a single blank 111 of sheet material as best seen in Fig. 5. The erection steps of the blank 111 into the container 110 are shown in Fig. 6. The container 110 corresponds generally to the container 10 except that the corner connecting members form columns in the corners as well as intermediate the ends of the side walls. The blank 111 is formed generally in the same manner as the blank 11.

Those portions of the blank 111 corresponding generally to the blank 11 have similar reference numbers applied thereto displaced by 100. As seen in Fig. 5, the blank 111 has a rectilinear

bottom panel 115 with opposed side panels 116 joined to the bottom panel along side fold lines 118 and with a pair of end panels 119 joined to the opposite ends of bottom panel along the end fold lines 120. Top flaps 121 are foldably joined to the side panels 116 at the projecting edge thereof along top fold lines 122 with the width of the top flaps 121 being such that they overlap when the flaps 121 are closed. The flutes F are typically arranged so that they run longitudinally of the bottom panel 115 similar to those of the blank 11.

A corner connecting member 125 is integral with each side edge of each end panel 119 along fold lines 126 oriented normal to the fold line 120 and is separated from the side panel 116 and flap 121 by cut 128. Cut 128 forms a sealing tab 129 joined to the end of the top flap 121 along the perforated fold line 130 to form a cutout in the corner connecting member 135. The height and the length of the corner connecting member 125 corresponds to that of the member 25 in the blank 11.

The corner connecting member 125 includes a base section 135, an intermediate column sections 136, a return section 138, a corner column section 137 and an end overlap section 139. The base section 135 corresponds to the base section 35 on the blank 11 and projects outwardly from the fold line 126 the distance d_1 to fold line 140 parallel to fold line 126. The column section 136 corresponds to the column section 36 of the blank 11 and is foldably connected to the base section 135 at fold line 140. The column section 136 has portions 141 and 142 joined along fold line 144 with both portions 141 and 142 having a transverse width and height corresponding to the portions 41 and 42 of the blank 11. The return section 138 is foldably connected to the edge of portion 136 along fold line 145 and extends to fold line 147 located a distance d_2 from the fold line 145. The corner column section 137 is foldably joined to the return section 138 along fold line 147 with the opposite edge of the section 137 foldably joined to the end overlap section 139 along the fold line 146 parallel to the fold lines 145 and 147.

The erection of the blank 111 into the container 110 is illustrated in Fig. 6 and corresponds generally to the erection process with the blank 11. The erection stages have been labelled A-F for the blank 111 in Fig. 6 with the additional diagrams showing the top flaps being closed as with the blank 11.

Stage A shows the interior side of blank 111 after adhesive has been applied to maintain the container 110 erected (see Fig. 5). The adhesive AD is applied to that portion of the base section 135 of each corner connecting member 125 which the return section 138 of the member 135 will overlie and also to those portions of the end panels 119 which the end overlap sections 139 will overlie. Unlike the blank 11, it will be noted that those portions of the end panels 119 and the base section 135 of the connecting member 125 adjacent the corner fold line 126 have no adhesive applied thereto on the panel 111. This is the portion of the blank 111 which will underlie the erected corner column section 137 which is not bonded to the base section 135 of the end panel 119. Like the blank 11, adhesive AD is applied to those portions of the side panels 116 which the base sections 135 of the corner connecting members 125 will overlie.

Stage B shows the blank 111 after the corner connecting members 125 have been folded inwardly about the fold lines 140 so that the rest of the member 125 projecting past the fold line 140 is normal to the plane of the blank 111. Stage C shows the blank 111 after the column sections 136 of the corner connecting members 125 have been folded inwardly along the fold lines 140 with the portions 141 and 142 folded about the fold line 144 to form the column apex 148 along the fold line 144. The return section 148 is folded with respect to the column section 136 along the fold line 145 and pressed against the adhesive on the base section 135 to hold it in place. At the same time, the corner column section 137 and return section 138 are folded outwardly with respect to the return section 138 about fold line 147 until sections 137 and 139 are normal to the return section 138. While the sections 137 and 139 are held off of the end panel 119, the corner connecting members 125 are folded inwardly about the fold lines 126 so that the base sections 135 of the members 125 are generally normal to the end panels 119. The end overlap sections 139 are then folded with respect to the corner column section 137 along the fold lines 146 and the end overlap sections 139 pressed down onto the adhesive AD on the end panels 119 to secure them to the end panels 119. This orients the corner post sections 137 at an angle across the corner formed between the end panels 119 and base section 135. The blank 111 is shown in this condition at stage D.

With the corner connecting members 125 thus attached, the end panels 119 with the corner connecting members 125 attached thereto are folded up about the fold lines 120 until the end panels 119 are oriented generally normal to the bottom panel 115. This places the corner connecting members 125 so that the base sections 135 thereof lie along the fold lines 118 where the side panels are joined to the bottom panel 115. This is illustrated in stage E.

Thereafter, the side panels 116 are folded up about the fold lines 118 and then pressed against the base sections 135 of the members 125 to cause the adhesive AD on the side panels 116 to secure the base sections 135 of the members 125 to the side panel 116. This is shown in stage F and completes the erection of the container 110.

Subsequently, the container 110 is loaded while the flaps 121 are still open and then the flaps 121 folded over and the sealing tabs 129 secured to the end panels 119. Also, the overlapped top flaps 121 are typically adhesively joined in their overlapped portions.

The container 110 is similarly dimensioned to the container 10 with a width W_c less than its length L_c as seen in Fig. 4, While the width W_c

may vary, it is illustrated at about two-thirds the length L_C. Thus, when two containers are cross stacked with a side panel 116 on one container lined up with the end panel 119 on the other container and with an end panel 119 on the one container lined up with the side panel 116 on the other container, the remaining side panel 116 on each container will cross over the other container at a cross over distance d_{co} from the aligned end panel 19 of each corresponding to the width W_C of the container 110. Like the container 10, the apex 148 of the column section 136 is located in the vicinity of the cross over point of the side walls. Thus, the apex 148 is preferably located a distance d_{co} from the opposite end panel 119, however, it is contemplated that a range of about one inch from distance d_{co} will work satisfactorily. The strength results are similar to those for the container 10.

It will be noted that the erected column sections 36 and 136 have a triangular cross section with a prescribed projecting height h_1 which corresponds generally to the misalignment range likely to be encountered when the containers are stacked. Typically, the height h_1 is nominally one inch and may vary over a range of 1/2—2 inches. This serves to minimize the distance the column sections 136 project out into the interior of the container 10 or 110. It will also be appreciated that the cross sectional shape of the columns may be changed as required without departing from the scope of the invention.

The flutes F are oriented in the blank 11 or 111 so that maximum column strength is achieved in the column sections 36 or 136. Those blanks 11 and 111 illustrated show the flutes F running along the height of the column sections 36 and 136. This orientation is typically used on containers where the container width is less than about 1.5 times the container depth and the container depth is greater than about eight inches. For containers with a width greater than about 1/5 times its depth and a depth of about eight inches or less, the flutes F are oriented generally normal to the column height.

Claims

1. A container formed from a single blank of foldable sheet material comprising:

a bottom panel (15) (115) having opposed sides (18) (118) and opposed ends (20) (120);

opposed end panels (19) (119) and side panels (16) (116) joined to said bottom panel respectively along the opposed ends (20) (120) and sides (18) (118) thereof, said end panels (19) (119) and side panels (16) (116) being erected to an upright position and forming corners, therebetween to define an open top material receiving cavity therein, said end panels having opposed ends (26, 126) along said corners;

and a first pair of column forming members (25) (125) joined to one of said end panels (19) (119) at the opposite ends (26, 126) thereof, each of said column forming members (25) (125) including, a first section (35) (135) joined to the end (26) (126) of said end panel (19) (119) and projecting along the inside of said side panel (16) (116) at the corner toward the opposite end panel, said first section (35) (135) being secured to said side panel (16, 116), and a second section (41) (42) (141) (142) joined to the projecting end of said first section, characterised in that each second section (40, 41, 140, 141) is formed into a tubular column (36) (136) projecting interiorly of its respective side panel and located at a distance from said one end panel (19, 119).

2. A container as claimed in Claim 1 characterised in that the container has a prescribed width WC and a prescribed length LC greater than the width, and said first section (35) (135) of each of said column forming members (25) (125) is sized to locate said tubular column (36) (136) at a prescirbed distance (dco) from said opposing end panel (19) (119) corresponding to the width WC of the container to increase the cross stacking strength of the container.

3. A container as claimed in Claim 1 or Claim 2, characterised in that there is further provided a second pair of said column forming members (25) (125) joined to the opposing second end panel (19) (119) at the opposite ends thereof.

4. The container of any one of Claims 1 to 3 characterised in that each of said column forming members (25) (125) further includes a third section (38) (138) joined to said second section (41) (42) (141) (142), overlying said first section (35) (135) to the interior surface thereof and secured thereto.

5. A container as claimed in Claim 4 characterised in that each of said column forming members (25) further includes a fourth section (39) joined to said third section (38), and which overlies a portion of said end panel (19) adjacent said corner and secured thereto.

6. A container as claimed in Claim 4 characterised in that each of said column forming members (125) further includes a fourth section (137) extending angularly between said third section (138) and said end panel (119) inwardly of said corner, and a fifth section (139) joined to fourth section (137), and overlying a portion of said end panel (119) and secured thereto.

7. A container as claimed in any one of Claims 1 to 6 characterised in that said sheet material is corrugated fibreboard having flutes therein and wherein said column forming members (25, 125) are oriented so that said flutes therein extend along the length of said tubular column (36, 136, 137).

8. A container as claimed in any one of Claims 1 to 7 characterised in that each of said tubular columns (36) (136) is oriented normal to said bottom panel.

9. A container as claimed in any one of Claims 1 to 8, characterised in that each of said tubular columns (36) (136) has a triangular transverse cross sectional shape.

10. A container as claimed in any one of Claims 1 to to 9, further characterised by at least one top

closure flap (21, 121) joined to one of said side panels (16, 116) and each of said tubular columns (36) extends between said bottom panel (15) (115) and said top closure flap (21, 121) when the container is closed.

11. A container as claimed in any one of Claims 1 to 10 characterised in that each of said tubular columns (36, 136) projects into said container from said side panel (16, 116) a distance of 1/2—2 inches (12—50mm).

12. A method of forming a container (10, 110) according to claim 1 from a blank (11, 111) comprising a bottom panel (15, 115), opposed end panels (19, 119) and opposed side panels (16, 116), foldably connected to the bottom panel (15, 115) along respective fold lines (18, 118) (20, 120), and corner connecting members (25, 125) foldably connected to opposite ends (26, 126) of each of the end panels (19, 119),

said method comprising the steps of:

a) applying adhesive to interior surface areas AD of the corner connecting members (25, 125) and end panels (19, 119),

b) folding the corner connecting members (25, 125) upon themselves so that end portions (39, 139) thereof can overlap the end panels (19, 119),

c) folding the end panels (19, 119) and associated corner connecting members (25, 125) approximately 90 degrees so that the corner connecting members (25, 125) extend along the fold lines (20, 120) between the bottom panel (15, 115) and side walls (16, 116), and

d) folding the side walls (16, 116) into face, contacting relationship with the corner connecting members (25, 125) with an adhesive therebetween to secure the side walls (16, 116) to the connecting members,

characterised in that after step b) but prior to step c) the end portions (39, 139) of the corner connecting members (25, 125) are maintained out of contact with the adhesive applied to the end panels (19, 119) while folding the connecting members (25, 125) up to a position generally normal to the end panels; and the end portions (39, 139) of the corner connecting members are then contacted with the adhesive on the end panels (19, 119) to secure said end portions thereto.

13. A method according to claim 12 further characterised by forming a tubular column (36) (136) (137) in the corner connecting member (25, 125) as the corner connecting member (25, 125) is being folded back over, itself.

14. A method is claimed in claim 13 characterised in the step of forming the tubular column (36) (136) in the corner connecting member (25, 125) includes locating the column (36) (136) so that the column will be located substantially at a cross over point on the container (10) (110) when said containers are cross stacked.

Patentansprüche

1. Behälter, ausgebildet aus einem Einzelzuschnitt eines faltbaren Bogenmaterials mit:

einer Bodenwand (15) (115) mit sich gegenüberliegenden Seiten (18) (118) und sich gegenüberliegenden Stirnseiten (20) (120);

sich gegenüberliegenden Stirnseitenwänden (19) (119) und Seitenwänden (16) (116), die mit der Bodenwand jeweils entlang deren sich gegenüberliegenden Stirnseiten (20) (120) und Seiten (18) (118) verbunden sind, wobei die Stirnseitenwände (19) (119) und die Seitenwände (16) (116) in eine aufrechte Stellung aufgerichtet sind und zwischen sich Ecken bilden, um einen oben offenen Materialaufnahmehohlraum zu begrenzen, wobei die Stirnseitenwände entlang den Ecken sich gegenüberliegende Enden (26, 126) aufweisen;

und einem ersten Paar säulenbildender Elemente (25) (125), die mit einer der Stirnseitenwände (19) (119) an deren sich gegenüberliegenden Enden (26, 126) verbunden sind, wobei jedes der säulenbildenden Elemente (25, 125) einen ersten Abschnitt (35, 135), der mit dem Ende (26) (126) der Stirnseitenwand (19) (119) verbunden ist und entlang der Innenseite der Seitenwand (16) (116) an der Ecke zur gegenüberliegenden Stirnseitenwand vorragt, wobei dieser erste Abschnitt (35) (135) mit der Seitenwand (16) (116) verbunden ist, und einen zweiten Abschnitt (41) (42) (141) (142) einschließt, der mit dem vorragenden Ende des ersten Abschnittes verbunden ist, dadurch gekennzeichnet, daß jeder zweite Abschnitt (40, 41, 140, 141) zu einer röhrenförmigen Säule (36) (136) ausgebildet ist, die sich einwärts von ihrer entsprechenden Seitenwand erstreckt und in einem Abstand von der einen Stirnseitenwand (19, 119) angeordnet ist.

2. Behälter nach Anspruch 1, dadurch gekennzeichnet, daß der Behälter eine vorbestimmte Breite WC und eine vorbestimmte Länge LC, die größer als die Breite ist, aufweist, und der erste Abschnitt (35) (135) jedes der säulenbildenden Elemente (25) (125) so bemessen ist, daß die röhrenförmige Säule (36) (136) in einem bestimmten Abstand (DCO) von der gegenüberliegenden Stirnseitenwand (19) (119), der mit der Breite WC des Behälters korrespondiert, anzuordnen, um die Kreuzstapelfestigkeit des Behälters zu vergrößern.

3. Behälter nach Anspruch 1 oder Anspruch 2, dadurch gekennzeichnet, daß ein zweites Paar säulenbildender Elemente (25) (125) vorgesehen ist, die mit der gegenüberliegenden zweiten Stirnseitenwand (19) (119) an deren sich gegenüberliegenden Enden verbunden ist.

4. Behälter nach irgendeinem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß jedes der säulenbildenden Elemente (25) (125) einen dritten Abschnitt (38) (138) einschließt, der mit dem zweiten Abschnitt (41) (42) (141) (142) verbunden ist, der den ersten Abschnitt (35) (135) an dessen Innenfläche überlappt und an dieser befestigt ist.

5. Behälter nach Anspruch 4, dadurch gekennzeichnet, daß jedes der säulenbildenden Elemente (25) einen vierten Abschnitt (39) einschließt, der mit dem dritten Abschnitt (38) verbunden ist, und der einen Abschnitt der Stirnsei-

tenwand (19) in der Nähe der Ecke überlappt und an dieser befestigt ist.

6. Behälter nach Anspruch 4, dadurch gekennzeichnet, daß jedes der säulenbildenden Elemente (125) einen vierten Abschnitt (137) aufweist, der sich winklig zwischen dem dritten Abschnitt (138) und der Stirnseitenwand (119) innenseitig von der Ecke erstreckt, und einen fünften Abschnitt (139) der mit dem vierten Abschnitt (137) verbunden ist und der einen Teil der Stirnseitenwand (119) überlappt und an dieser befestigt ist.

7. Behälter nach irgendeinem der Ansprüche 1 bis 6, dadurch gekennzeichnet, daß das Bogenmaterial Wellpappe mit darin befindlicher Wellenlage ist, und daß die säulenbildenden Elemente (25, 125) so ausgerichtet sind, daß die Wellen sich in Längsrichtung der röhrenförmigen Säule (36, 136, 137) erstrecken.

8. Behälter nach irgendeinem der Ansprüche 1-7, dadurch gekennzeichnet, daß jede der röhrenförmigen Säulen (36) (136) in Normalrichtung zur Bodenwand ausgerichtet ist.

9. Behälter nach irgendeinem der Ansprüche 1 bis 8, dadurch gekennzeichnet, daß jede der röhrenförmigen Säulen (36) (136) eine dreieckige Querschnittsgestalt aufweist.

10. Behälter nach irgendeinem der Anspruche 1 bis 9, gekennzeichnet durch wenigstens eine obere Verschlußklappe (21, 121), die mit einer der Seitenwände (16) (116) verbunden ist und dadurch, daß sich jede der röhrenförmigen Säulen (36) zwischen der Bodenwand (15) (115) und der oberen Verschlußklappe (21, 121) erstreckt, wenn der Behälter verschlossen ist.

11. Behälter nach irgendeinem der Ansprüche 1 bis 10, dadurch gekennzeichnet, daß sich jede der röhrenförmigen Säulen (36, 136) von der Seitenwand (16, 116) um einen Betrag von 1/2-2 Zoll (12 bis 50 mm) in den Behälter erstreckt.

12. Verfahren zum Ausbilden eines Behälters (10) (110) nach Anspruch 1 aus einem Zuschnitt (11) (111), mit einer Bodenwand (15) (115), faltbar mit der Bodenwand (15, 115) entlang entsprechender Faltlinien (18, 118) (20, 120) verbundenen sich jeweils gegenüberliegenden Stirnseitenwänden (19, 119) und Seitenwänden (16, 116) und Eckverbindungselementen (25, 125), die faltbar mit sich gegenüberliegenden Enden (26, 126) jeder der Stirnseitenwände (19, 119) verbunden sind, wobei das Verfahren die folgenden Schritte aufweist:

a) Klebstoffauftragen auf innere Oberflächenbereiche AD der Eckverbindungselemente (25, 125) und Stirnseitenwände (19, 119),

b) Übereinanderfalten der Eckverbindungselemente (25, 125) so, daß Endbereiche von ihnen (39, 139) die Stirnseitenwände (19, 119) überlappen können,

c) Falten der Stirnseitenwände (19, 119) und der zugehörigen Eckverbindungselemente (25, 125) ungefähr um 90°, so daß sich die, Eckverbindungselemente (25, 125) entlang der Faltlinien (20, 120) zwischen der Bodenwand (15, 115) und den Seitenwänden (16, 116) erstrecken, und

d) Falten der Seitenwände (16, 116) in gegenseitige Berührungsbeziehung mit den Eckverbindungselementen (25, 125) mit einem Klebemittel dazwischen, um die Seitenwände (16, 116) an den Verbindungselementen zu befestigen,

dadurch gekennzeichnet, daß nach Schritt b), jedoch vor Schritt c), die Endbereiche (39, 139) der Eckverbindungselemente (25, 125) während des Aufrichtens der Verbindungselemente (25, 125) in eine Position allgemein lotrecht zu den Stirnseitenwänden außer Berührung mit dem Klebemittel, das auf die Stirnseitenwände (19, 119) aufgetragen ist, gehalten werden; und die Endbereiche (39, 139) der Eckverbindungselemente nachfolgend in Berührung mit dem Klebemittel auf den Stirnseitenwänden (19, 119) gebracht werden, um die Endbereiche daran zu befestigen.

13. Verfahren nach Anspruch 12, gekennzeichnet durch Ausbilden einer röhrenförmigen Säule (36) (136) (137) im Eckverbindungsteil (25, 125), während das Eckverbindungselement (25, 125) über sich selbst zurückgefaltet wird.

14. Verfahren nach Anspruch 13, dadurch gekennzeichnet, daß der Schritt des Ausbildens der röhrenförmigen Säule (36) (136) im Eckverbindungselement (25, 125) das Anordnen der Säule (36, 136) in einer solchen Position einschließt, so daß die Säule im wesentlichen an einem Überkreuzungspunkt am Behälter (10) zu liegen kommt, wenn die Behälter kreuzweise gestapelt werden.

Revendications

1. Emballage formé à partir d'un flan unique d'un matériau en feuille pliable, comprenant:

un panneau de fond (15; 115) ayant des côtés opposés (18; 118) et des extrémités opposées (20; 120);

des panneaux terminaux opposés (19; 119) et des panneaux latéraux (16; 116) se raccordant au panneau de fond respectivement le long des extrémités opposées (20; 120) et des côtés (18; 118) de celui-ci, les panneaux terminaux (19; 119) et les panneaux latéraux (16; 116) étant redressés en.position verticale et formant entre eux des angles pour définir une cavité à haut ouvert recevant un produit, les panneaux terminaux ayant des extrémités opposées (26; 126) le long de ces angles; et

une première paire d'éléments formant montant (25; 125), se raccordant à l'un des panneaux terminaux (19; 119) au niveau de ses extrémités opposées (26; 126), chacun des éléments formant montant (25; 125) comprenant une première section (35; 135) se raccordant à l'extrémité (26; 126) de ce panneau terminal (19; 119) et se projetant le long de l'intérieur du panneau latéral (16; 116) au niveau de l'angle en direction dupanneau terminal opposé, cette première section (35; 135) étant fixée au panneau latéral (16; 116), et une deuxième section (41, 42; 141, 142) se raccordant à l'extrémité dépassante de la première section, caractérisée en ceque chaque deuxième section (40, 41; 140, 141) est formée en un montant

tubulaire (36; 136) se projetant vers l'intérieur de son panneau latéral respectif et disposée à une certaine distance du panneau terminal (19, 119).

2. Emballage selon la revendication 1, caractérisé en ce que l'emballage a une largeur prescrite (W_c) et une longueur prescrite (L_c) supérieure à la largeur, et en ce que la première section (35; 135) de chacun des éléments formant montant (25; 125) est dimensionnée pour positionner le montant tubulaire (36; 136) à une distance prescrite (d_{co}) du panneau terminal opposé (19; 119) correspondant à la largeur W_c de l'emballage pour augmenter la résistance à l'emballage croisé de l'emballage.

3. Emballage selon la revendication 1 ou la revendication 2, caractérisé en ce qu'il est en outre prévu une deuxième paire d'éléments formant montant (25; 125) se raccordant au deuxième panneau terminal opposé (19; 119) au niveau de ses extrémités opposées.

4. Emballage selon l'une quelconque des revendications 1 à 3, caractérisé en ce que chacun des éléments formant montant (25; 125) comprend en outre une troisième section (38; 138) se raccordant à la deuxième section (41, 42; 141, 142), recouvrant la première section (35; 135) jusqu'à sa surface intérieure et fixée à cette dernière.

5. Emballage selon la revendication 4, caractérisé en ce que chacun des éléments formant montant (25) comporte en outre une quatrième section (39) se raccordant à la troisième section (38) et recouvrant une portion du panneau terminal (19) adjacent à cet angle et fixé à lui.

6. Emballage selon la revendication 4, caractérisé en ce que chacun des éléments formant montant (125) comporte en outre une quatrième section (137) s'étendant en oblique entre la troisième section (138) et un panneau terminal (119) à l'intérieur de cet angle, et une cinquième section (139) se raccordant à la quatrième section (137), recouvrant une portion du panneau terminal (119) et fixée à celui-ci.

7. Emballage selon l'une quelconque des revendications 1 à 6, caractérisé en ce que la matériau en feuille est un carton dur ondulé comportant des cannelures et en ce que les éléments formant montant (25; 125) sont orientés de telle sorte que les cannelures qu'ils comportent s'étendent sur la longueur du montant tubulaire (36; 136, 137).

8. Emballage selon l'une quelconque des revendications 1 à 7, caractérisé en ce que chacun des montants tubulaires (36; 136) est perpendiculaire au panneau de fond.

9. Emballage selon l'une quelconque des revendications 1 à 8, caractérisé en ce que chacun des montants tubulaires (36; 136) a une section transversale triangulaire.

10. Emballage selon l'une quelconque des revendications 1 à 9, caractérisé en ce qu'au moins un rabat de fermeture supérieur (21; 121) se raccorde à l'un des panneaux latéraux (16; 116) et en ce que chacun des montants tubulaires (36) s'étend entre le panneau de fond (15; 115) et ce rabat de fermeture supérieur (21; 121) lorsque le récipient est fermé.

11. Emballage selon l'une quelconque des revendications 1 à 10, caractérisé en ce que chacun des montants tubulaires (36; 136) se projette dans l'emballage depuis le panneau latéral (16; 116) d'une distance comprise entre 12,5 et 50mm.

12. Procédé pour former un emballage (10; 110) selon la revendication 1, à partir d'un flan (11; 111) comprenant un panneau de fond (15; 115), des panneaux terminaux opposés (19; 119) et des panneaux latéraux opposés (16; 116) se raccordant par pliage au panneau de fond (15; 115) le long de lignes de pliage respectives (18, 20; 119, 120) et des éléments de raccordement d'angle (25; 125) se raccordant par pliage aux extrémités opposées (26; 126) de chacun des panneaux latéraux (19; 119), ce procédé comprenant les stades suivants:

a) appliquer de la colle sur des zones AD de la face intérieure des éléments de raccordement (25; 125) et des panneaux terminaux (19; 119),

b) replier sur eux-mêmes les éléments de raccordement d'angle (25; 125) de façon que leurs portions terminales (39; 139) recouvrent les panneaux terminaux (19; 119),

c) plier les panneaux terminaux (19; 119) et les éléments de raccordement associés (25; 125) approximativement de 90° de façon que les éléments de raccordement d'angle (25; 125) s'étendent le long des lignes de pliage (20; 120) entre le panneau de fond (15; 115) et les parois latérales (16; 116), et

d) plier les parois latérales (16; 116) en contact surfacique avec les éléments de raccordement d'angle (25; 125) avec une colle entre eux pour fixer les parois latérales (16; 116) sur les éléments de raccordement,

caractérisé en ce que, après le stade b), mais avant le stade c), les portions terminales (39; 139) des éléments de raccordement d'angle (25; 125) sont maintenues à l'abri du contact avec la colle appliquée sur les panneaux terminaux (19; 119) pendant que l'on plie les éléments de raccordement (25; 125) vers le haut jusqu'à une position sensiblement perpendiculaire aux panneaux terminaux; et en ce que les portions terminales (39; 139) des éléments de raccordement d'angle sont ensuite mises en contact avec la colle sur les panneaux terminaux (19; 119) pour y fixer ces portions terminales.

13. Procédé selon la revendication 12, caractérisé en ce qu'on forme un montant tubulaire (36; 136; 137) dans l'élément de raccordement d'angle (25; 125) lorsque l'élément de raccordement d'angle (25; 125) est replié sur lui-même.

14. Procédé selon la revendication 13, caractérisé en ce que, dans le stade de formage du montant tubulaire (36; 136) dans l'élément de raccordement d'angle (25; 125), on positionne le montant (36; 136) de façon qu'il soit situé pratiquement à un point de croisement de l'emballage (10; 110), lorsque ces emballages sont empilés en empilage croisé.

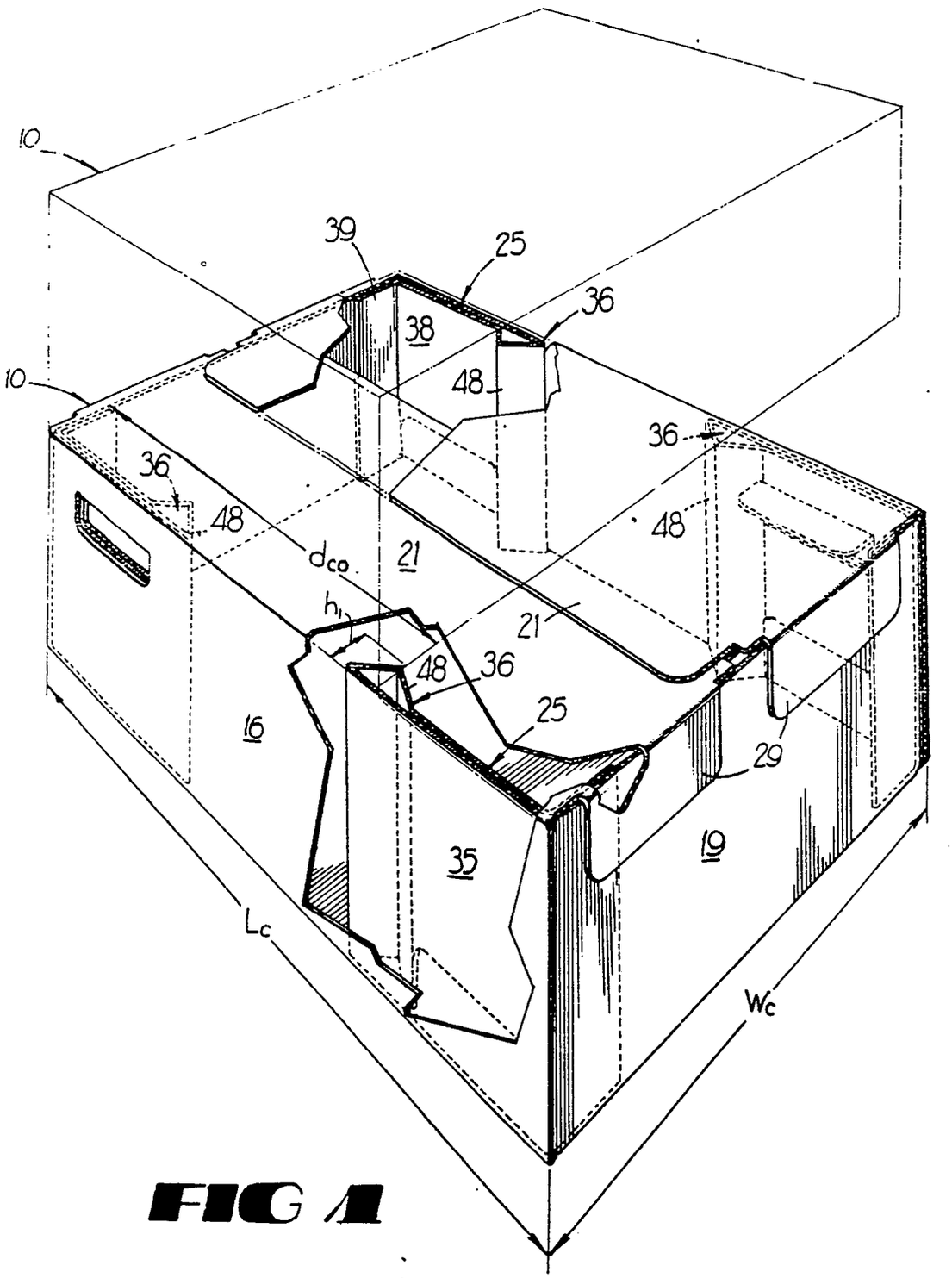
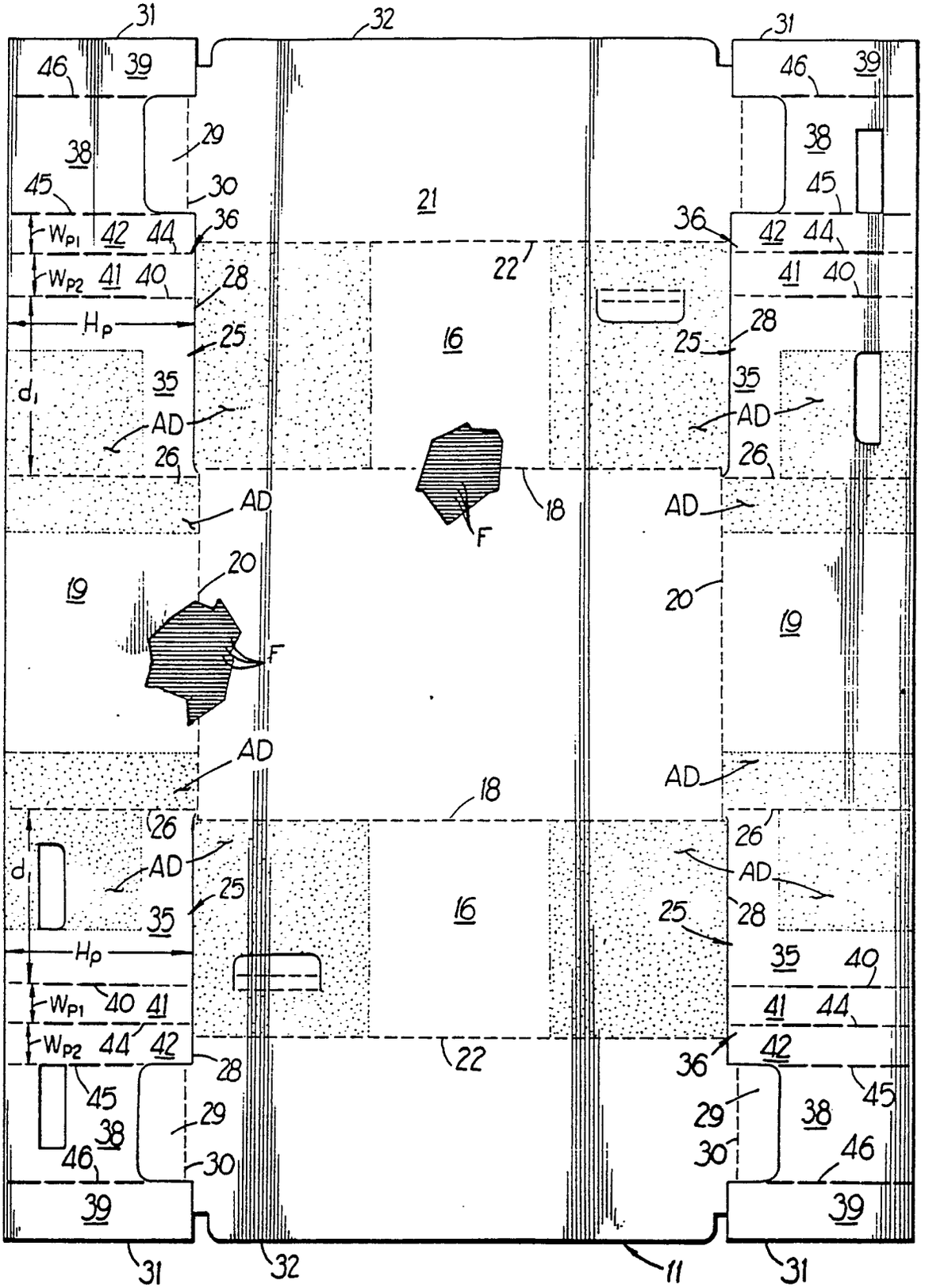


FIG 1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W_{P2}
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22
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H_P
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35
d_1
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FIG 2

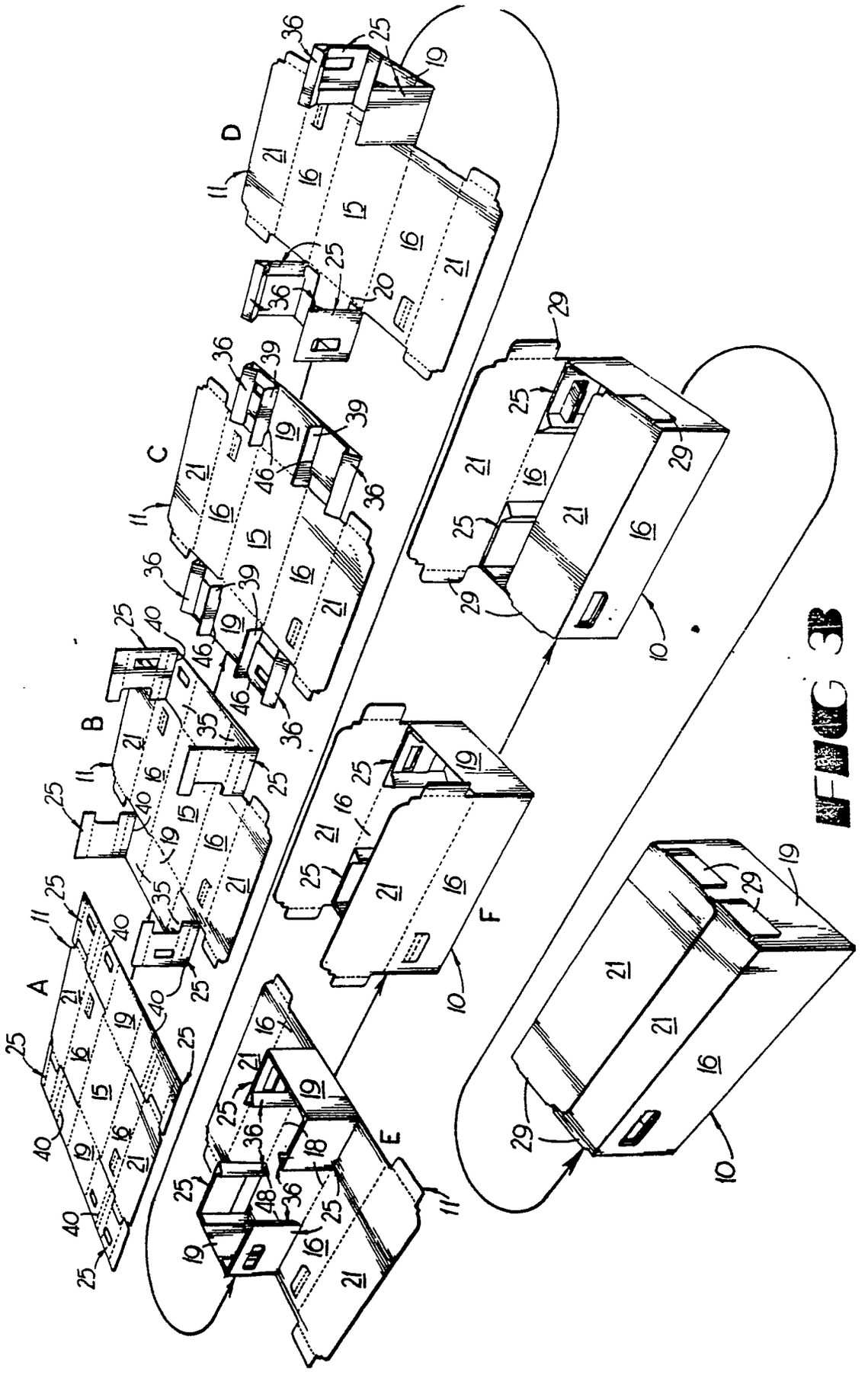
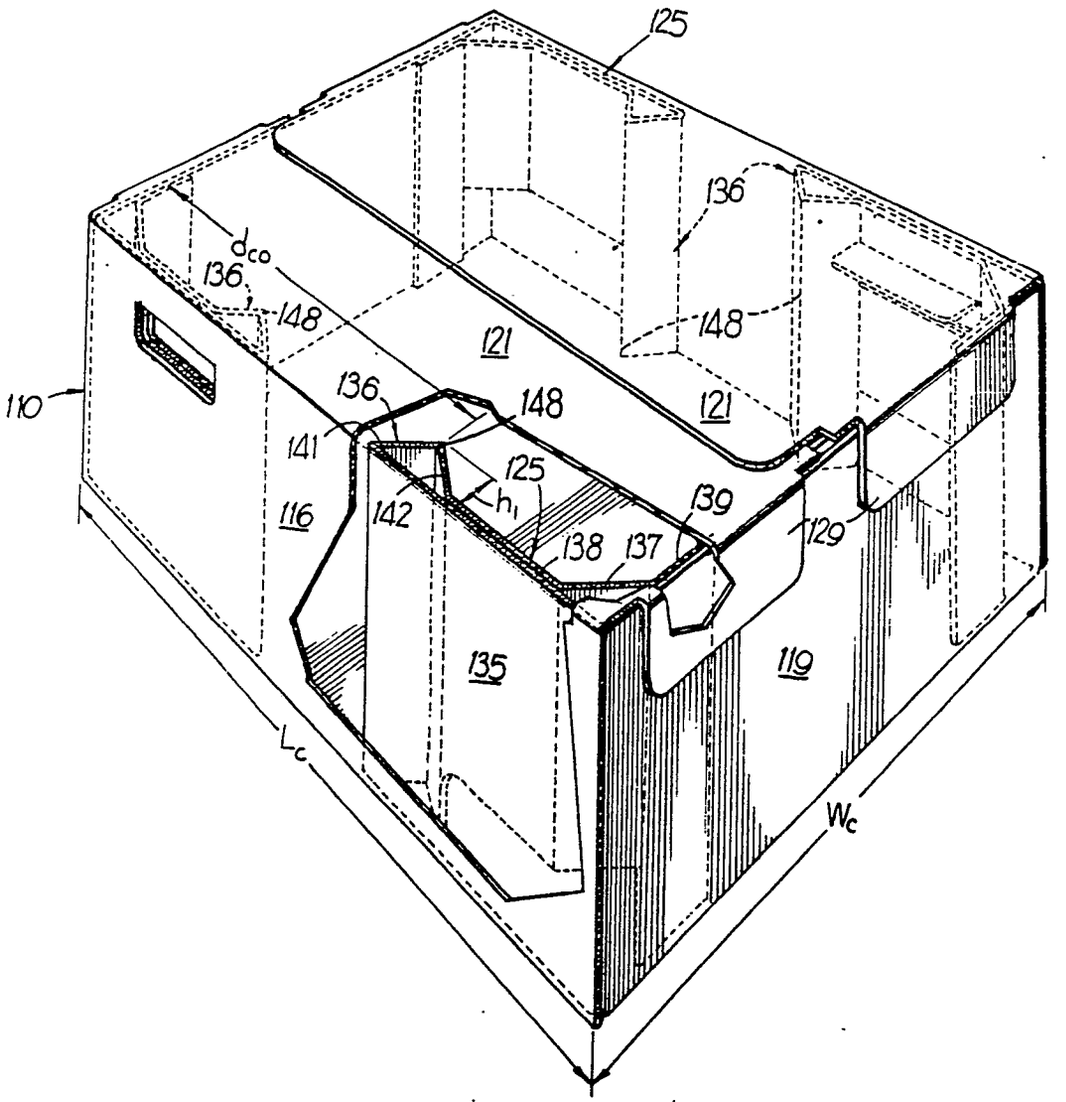


FIG 3B


125
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d_{co}
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148
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119
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FIG 4

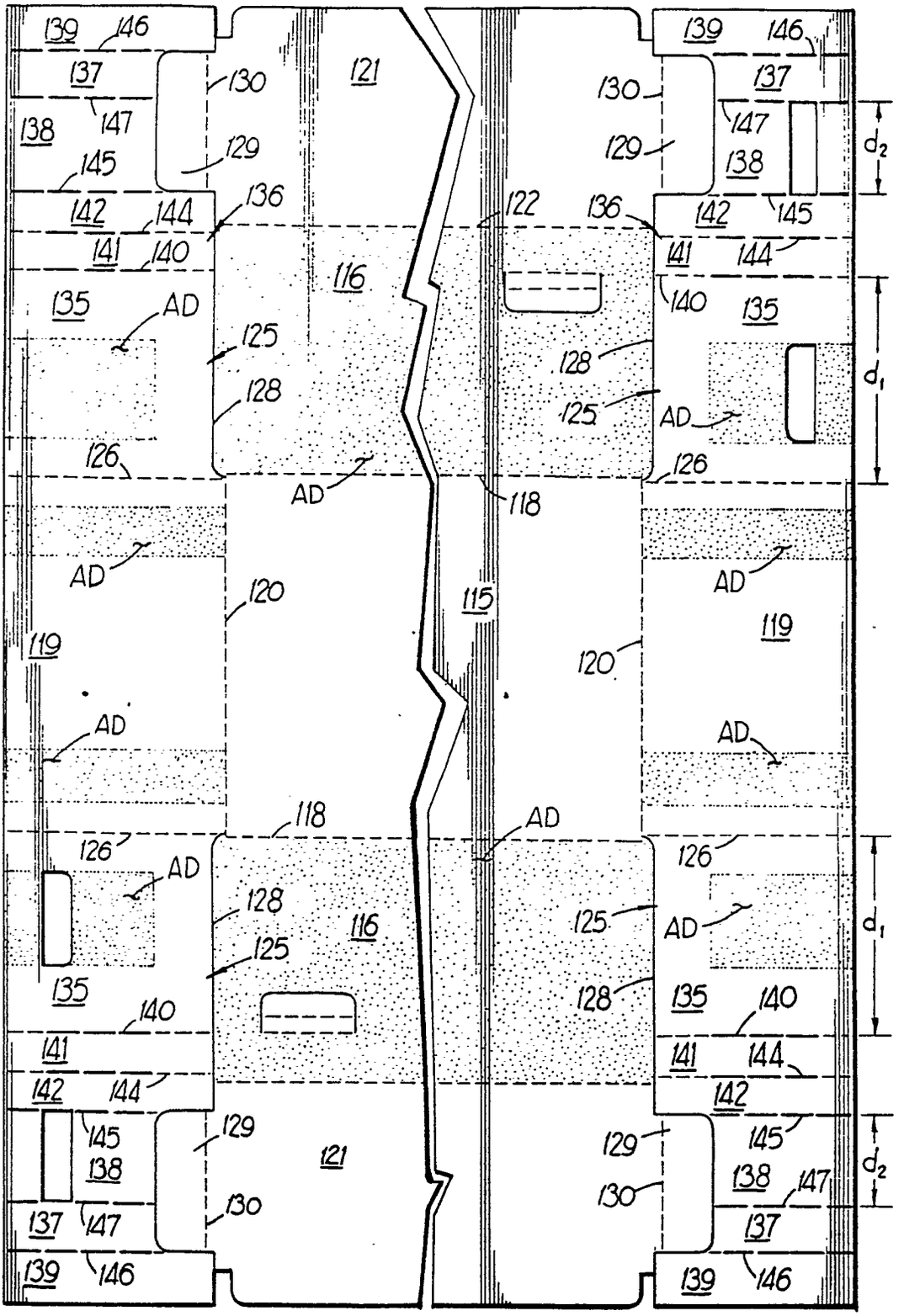
139
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FIG 5

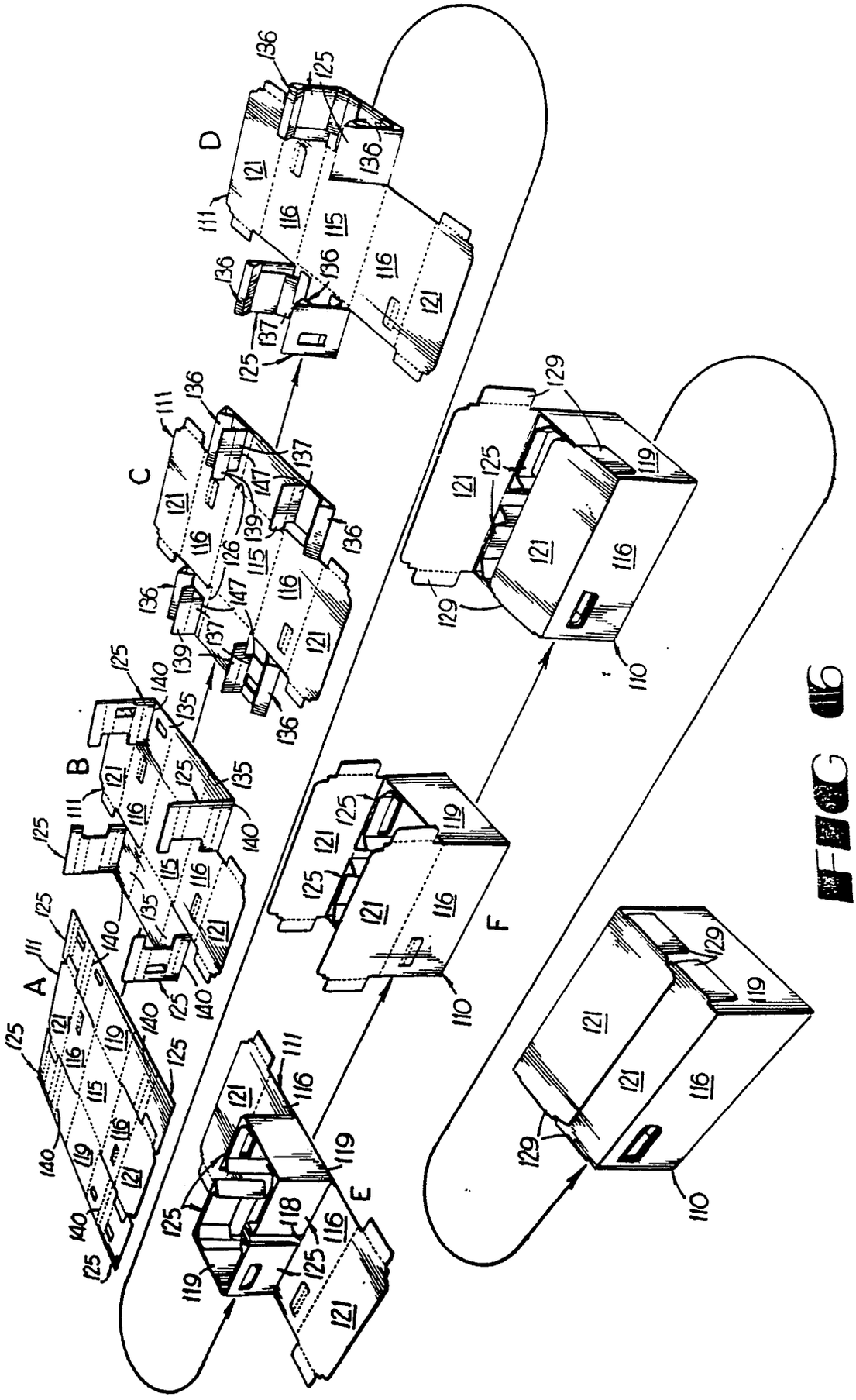
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FIG 6