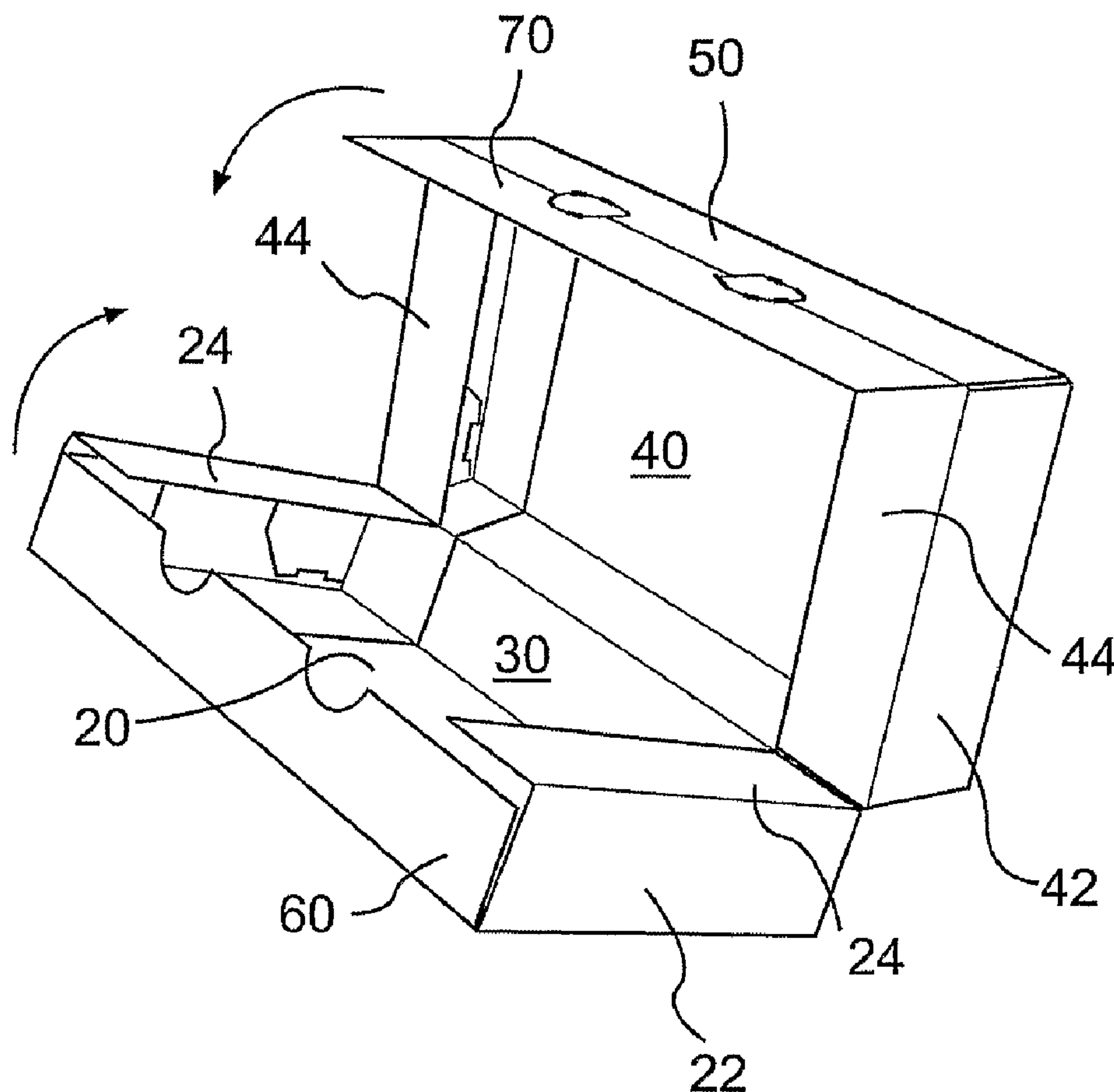




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(71) Demandeur/Applicant:
GRAPHIC PACKAGING INTERNATIONAL, INC., US
(72) Inventeurs/Inventors:
GOMES, JEAN-MANUEL, US;
COLTRI-JOHNSON, ANDREA, US
(74) Agent: MACRAE & CO.

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A carton has a multi-ply configuration which can be formed by overlying a primary blank with one or more reinforcing blanks.



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(71) Applicant: **GRAPHIC PACKAGING INTERNATIONAL, INC.** [US/US]; 814 Livingston Court, Marietta, GA 30067 (US).

(72) Inventors: **GOMES, Jean-Manuel**; 2699 Shadow Bluff Drive, Marietta, GA 30062 (US). **COLTRI-JOHNSON, Andrea**; 3138 Delacorte Drive, Acworth, GA 30101 (US).

(74) Agents: **ISAF, Louis, T.** et al.; **WOMBLE CARLYLE SANDRIDGE & RICE, PLLC**, P.O. Box 7037, Atlanta, GA 30357-0037 (US).

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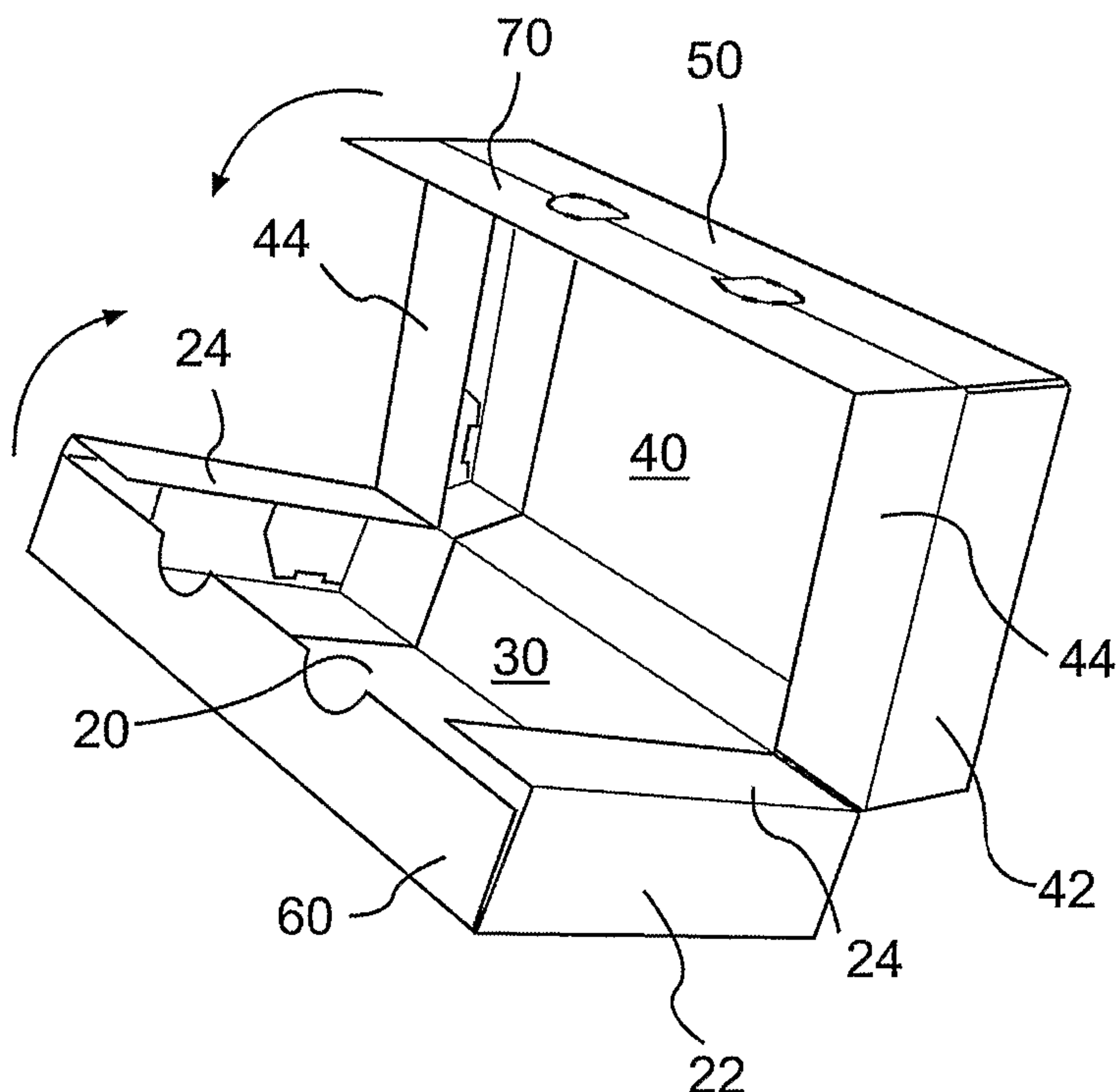
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(54) Title: REINFORCED CARTONS



(57) Abstract: A carton has a multi-ply configuration which can be formed by overlying a primary blank with one or more reinforcing blanks.

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REINFORCED CARTONS

RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Application No. 60/719,309, filed September 21, 2005, the entire contents of which are hereby incorporated by reference.

BACKGROUND

[0002] Cartons are typically shipped in bulk quantities. During shipping, the cartons may be vertically stacked upon each other in order to maximize the amount of product shipped in a particular vessel. The amount of product shipped may depend, however, on the load-bearing capacity of the stacked cartons. It is therefore desirable to produce cartons having high rigidity and/or strength in compression for shipping, and for other purposes such as the protection of the carton contents in general.

[0003] A conventional method for increasing the strength of a carton is to produce the carton from a blank of a different, stronger board material, or to produce the blank from the same carton material but of greater thickness. Such methods typically increase the costs associated with manufacturing the carton, with the material costs of manufacture generally increasing according to the cost of increasing the strength and/or thickness of the entire blank. Some sections of the blank, however, may not be load-bearing, and the additional costs associated with increasing the strength of non-load bearing sections of the blank are wasted.

SUMMARY

[0004] According to a first aspect of the invention, a carton is formed from a multiply carton blank. The carton blank comprises a primary blank and one or more reinforcing blanks overlying the primary blank. The reinforcing blanks can be adhered and/or otherwise attached to selected locations on the primary blank in order to increase desirable properties such as, for example, strength and rigidity in the

resultant carton. The size and location of the applied reinforcing blanks can be selected, for example, to minimize board use while providing a desired level of increased strength and/or rigidity.

[0005] The foregoing and other features, aspects, and advantages of the invention will become more apparent upon review of the detailed description of the preferred embodiments set forth below when taken in conjunction with the accompanying drawing figures, which are briefly described as follows.

BRIEF DESCRIPTION OF THE DRAWING FIGURES

[0006] According to common practice, the various features of the drawings discussed below are not necessarily drawn to scale. Dimensions of various features and elements in the drawings may be expanded or reduced to more clearly illustrate the embodiments of the invention.

[0007] **FIG. 1A** is a plan view of primary and reinforcing blanks used to form a carton according to a first embodiment of the invention.

[0008] **FIG. 1B** illustrates the blanks of **FIG. 1A** combined into a multi-ply blank.

[0009] **FIGS. 2A-2E** illustrate erection of the first carton embodiment from the blank of **FIG. 1B**.

[0010] **FIGS. 3A and 3B** illustrate the first carton embodiment.

[0011] **FIG. 4A** illustrates the first carton embodiment with its handles accessed.

[0012] **FIG. 4B** illustrates the first carton embodiment after opening the carton.

[0013] **FIG. 5** is a plan view of primary and reinforcing blanks used to form a carton according to a second embodiment of the invention.

[0014] **FIG. 6A** is a plan view of primary and reinforcing blanks used to form a carton according to a third embodiment of the invention.

[0015] **FIG. 6B** illustrates the blanks of **FIG. 6A** combined into a multi-ply blank.

[0016] **FIGS. 7A-7E** illustrate erection of the third carton embodiment.

[0017] **FIG. 8** illustrates the third carton embodiment.

- [0018] FIG. 9A is a plan view of primary and reinforcing blanks used to form a carton according to a fourth embodiment of the invention.
- [0019] FIG. 9B illustrates the blanks of FIG. 9A combined into a multi-ply blank.
- [0020] FIG. 10 illustrates the fourth carton embodiment.
- [0021] FIG. 11 illustrates the fourth carton embodiment after opening the carton.
- [0022] FIGS. 12A-12E illustrate an alternative method of erecting the multi-ply blank of FIG. 1B into a carton.

DETAILED DESCRIPTION

- [0023] Briefly described, the present invention is directed to cartons having enhanced strength and rigidity. The cartons are formed from primary blanks reinforced with one or more reinforcing blanks adhered to the primary blanks. In this specification, the terms “bottom,” “side,” and “top” are used to indicate orientations determined in relation to fully erected cartons placed in upright configurations, and are not intended to limit the scope of the invention.
- [0024] FIG. 1A is a plan view of interior sides of a primary blank 6 and first and second reinforcing blanks 8, 9. The blanks 6, 8, 9 are used to form a carton 100 (illustrated in FIGS. 3A and 3B) according to a first embodiment of the invention. The interior sides of the blanks 6, 8, 9 will generally be disposed in the interior of the erected carton 100. The blanks 6, 8, 9 may be combined, for example, into a blank 10 (FIG. 1B) having multi-ply sections formed from adhering the first and second reinforcing blanks 8, 9 to the primary blank 6. As discussed in further detail below, the primary blank 6 can have a periphery that is complementary to portions of the peripheries of the reinforcing blanks 8, 9.
- [0025] Referring to FIG. 1A, the primary blank 6 comprises a first side panel 20 foldably connected to a bottom panel 30 at a first transversely extending fold line 31, a second side panel 40 foldably connected to the bottom panel 30 at a second transverse fold line 41, and a first top panel 50 foldably connected to the second side panel 40 at a third transverse fold line 41. A second top panel 60 may be foldably connected to the first side panel 20 at a fourth transverse fold line 61, and a third top panel 70 may be foldably connected to the second top panel 50 at a fifth transverse

fold line 71. The bottom panel 30 can be foldable at its spine or midpoint at a sixth transverse fold line 35 extending across the width of the bottom panel.

[0026] The first side panel 20 is foldably connected at each end to a first proximal side end flap 22, which is connected to a first distal side end flap 24. The bottom panel 30 is foldably connected at each end to two bottom end flaps 32. The bottom end flaps 32 are separated by transversely extending cuts 34. The second side panel 40 is foldably connected at each end to a second proximal side end flap 42, which is connected to a second distal side end flap 44. The first top panel 50 is foldably connected at each end to a first top end flap 52. The second top panel 60 is foldably connected at each end to a second top end flap 62. Handle apertures or knockouts 54 may be formed in one or both of the first and third top panels 50, 70. The end flaps 22, 24, 32, 42, 44, 52, 62 extend along a first and a second marginal area of the blank 6, and may be connected at first and second longitudinally extending fold lines 65, 66. The longitudinal fold lines 65, 66 may be straight, or they may be offset at one or more locations to account for, for example, blank thickness. The first side end flaps 22, 24 are foldably connected at longitudinal fold lines 25, and the second side end flaps 42, 44 are foldably connected at longitudinal fold lines 45.

[0027] The first reinforcing blank 8 has a perimeter that may be in part generally complementary to a part of the first marginal area of the primary blank 6. The first reinforcing blank 8 is meant to overlies a part of the first marginal area of the primary blank 6 in order to reinforce the blank 6. The first reinforcing blank 8 includes a strip 80 of sequentially arranged rectangular reinforcing panels 81, 82, 83, 84, 85, 86, 87, and foldably attached reinforcing end flaps 62', 22', 32', 32', 42', 52'. During erection, the blank 8 is placed over the primary blank 6 so that the reinforcing end flaps 62', 22', 32', 32', 42', 52' of the first reinforcing blank 8 overlies and generally conform in shape to corresponding end flaps 62, 22, 32, 32, 42, 52, respectively, of the primary blank 6. The sequentially arranged reinforcing panels 81, 82, 83, 84, 85, 86, 87 are aligned with respective panels 60, 20, 30, 40, 50, 70 of the primary blank 6 so that the reinforcing blank 9 folds along the transverse fold lines 61, 31, 35, 41, 51, 71 in the primary blank 6.

[0028] Similarly, the second reinforcing blank 9 has a shape that may be in part generally complementary to a part of the second marginal area of the primary blank 6, and is meant to overlie and reinforce a second part of the first blank 6. The second reinforcing blank 9 includes a strip 90 of sequentially arranged rectangular reinforcing panels 91, 92, 93, 94, 95, 96, 97, and reinforcing end flaps 62', 22', 32', 32', 42', 52'. During erection, the second reinforcing blank 9 is placed over the primary blank 6 so that the reinforcing end flaps 62', 22', 32', 32', 42', 52' of the reinforcing blank 9 overlie and generally conform in shape to the end flaps 62, 22, 32, 32, 42, 52 of the primary blank 6. The reinforcing panels 91, 92, 93, 94, 95, 96, 97 are aligned with respective panels 60, 20, 30, 40, 50, 70 of the primary blank 6 so that the second reinforcing blank 9 folds along the transverse fold lines 61, 31, 35, 41, 51, 71 of the primary blank 6. Portions of the second reinforcing blank 9 may be, for example, a mirror image of the first reinforcing blank 8, and certain common reference numerals are therefore used in the reinforcing blanks 8 and 9.

[0029] FIG. 1B illustrates the primary blank 6 and the reinforcing blanks 8, 9 combined into a multi-ply blank 10. In FIG. 1B, the reinforcing blanks 8, 9 are placed over the respective first and second marginal areas of the primary blank 6 and secured thereto 6. The first and second distal side end flaps 24, 44 at each end of the primary blank 6 extend beyond the edges of the reinforcing blanks 8, 9. Glue, for example, or other adhesives, or other means, may be used to secure the reinforcing blanks 8, 9 to the primary blank.

[0030] FIGS. 2A-2E illustrate erection of the multi-ply blank 10 into the carton 100. Certain elements of the blanks 6, 8, 9 referred to in the following description may not be visible in FIGS. 2A-2E, and such elements can be found in FIGS. 1A and 1B. FIG. 2A illustrates the multi-ply blank 10 ready for erection. In FIG. 2B, the end flaps 22, 24, 32, 32, 42, 44, 52, 62 (along with the reinforcing end flaps 62', 22', 32', 32', 42', 52') and the top panels 50, 60, 70 are folded inwardly. In FIG. 2C, the exterior sides of the end flaps 62, 32 are adhered to the interior sides of the reinforcing end flaps 22', and the exterior sides of the end flaps 32 and 52 are adhered to the interior sides of the reinforcing end flaps 42'. In FIG. 2D, the first and second side distal end flaps 24, 44 are folded inwardly until they are generally parallel to the

first and second side panels 20, 40, respectively. FIG. 2E illustrates the partially erected blank 10 being folded in the direction of the arrows to bring the opposed halves of the partially erected carton together. The opposed distal side end flaps 24, 44 may optionally be adhered together, if desired. The interior side of the third top panel 70 may be adhered to the exterior side of the second stop panel 60 to complete erection of the carton 100, as shown in FIGS. 3A and 3B. Articles (not shown) may be loaded into the carton 100 at any time prior to fully closing the carton 100.

[0031] FIGS. 3A and 3B illustrate the erected carton 100. The carton 100 may be, for example, generally parallelepipedal, and may have a closed or nearly closed configuration. In FIG. 3A, the carton 100 rests on the bottom panel 30. The first and second proximal side end flaps 22, 42 along with the reinforcing end flaps 22', 42' adhered thereto close the ends of the carton 100. The handle apertures 54 are accessible in the top panels 50, 70.

[0032] FIG. 4A illustrates the erected carton 100 with the handle apertures 54 accessed. FIG. 4B illustrates a portion of the interior of the carton 100 with the carton 100 fully opened. The carton 100 can be opened, for example, by separating the attachment of the third top panel 70 to the second top panel 60. FIG. 4B illustrates the reinforcing configuration of the reinforcing blank 9 in the carton 100. The reinforcing blank 9, as well as the reinforcing blank 8 (illustrated in FIG. 1A), provides additional strength and rigidity to the carton 100. For example, when the carton 100 is supported on the bottom panel 30 as shown in FIG. 4A, the panels and flaps 92, 95, 22', 42' of the reinforcing blank 9, and the reinforcing panels and flaps 82, 85, 22', 42' of the reinforcing blank 8 extend vertically within the carton 100 interior and provide significant strength against vertical axial compression. Similarly, if the carton 100 is supported on either of its side panels 20, 40, the first and second reinforcing blanks 8, 9 provide significant additional axial compressive strength and rigidity to the primary blank 6.

[0033] FIG. 5 illustrates a primary blank 106 and first and second reinforcing blanks 108, 109 according to a second embodiment of the invention. In FIG. 5, like reference numbers to the reference numbers shown in FIG. 1A indicate like or similar elements, with the reference numbers in FIG. 5 being preceded by "1." A resultant

multi-ply blank formed from the primary and reinforcing blanks **106, 108, 109** can be erected into a carton using the method shown in **FIGS. 2A-2E**. The primary blank **106** is substantially identical to the primary blank **6**, except the first and second distal side end flaps **124, 144** include beveled or truncated corners **125, 145**, respectively. The beveled corners **125, 145**, may, for example, provide ease of folding of the distal side end flaps **124, 144**, respectively during erection. The corners may be, for example, truncated with alternative cut patterns, such as arcuate or curved patterns.

[0034] **FIG. 6A** is a plan view of a primary blank **206** and first and second reinforcing blanks **208, 209** used to form a carton **300** (illustrated in **FIG. 8**) according to a third embodiment of the invention. The primary blank **205** is substantially identical to the primary blank **6** shown in **FIG. 1A**, except the first and second side distal end flaps **224, 244** include first and second extensions **225, 245**, respectively. In **FIGS. 6A-8**, like reference numbers to the reference numbers shown in **FIG. 1A** indicate like or similar elements, with the reference numbers in **FIGS. 6A-8** being preceded by “2.” **FIG. 6B** illustrates a multi-ply blank **210** formed by adhering the first and second reinforcing blanks **208, 209** to the primary blank **206**.

[0035] **FIGS. 7A-7E** illustrate erection of the multi-ply blank **210** into the carton **300**. Certain elements of the blanks **206, 208, 209** may not be visible in **FIGS. 7A-7E**, and such elements can be found in **FIGS. 6A** and **6B**. In **FIG. 7B**, the end flaps **222, 224, 232, 232, 242, 244, 252, 262** (along with the reinforcing flaps **262', 222', 232', 232', 242', 252'**) and the top panels **250, 260, 270** are folded inwardly. In **FIG. 7C**, the exterior sides of the end flaps **262, 232** are adhered to the interior sides of the reinforcing side end flaps **222'**, and the exterior sides of the end flaps **232** and **252** are adhered to the interior sides of the reinforcing side end flaps **242'**. In **FIG. 7D**, the first and second side distal end flaps **224, 244** are folded inwardly. The second extensions **245** are folded upwardly about their respective fold lines **247** so that they abut the interior side of the third top panel **270**. If desired, the second extensions **245** may be adhered to the third top panel **270**. The first extensions **225** are folded about their respective fold lines **227** so that they overlap the exterior side of the second top panel **260**. If desired, the first extensions **225** may be adhered to the second top panel **260**.

[0036] FIG. 7E illustrates the partially erected blank 210 being folded to bring the opposed halves of the partially erected carton together. The opposed first and second distal side end flaps 224, 244 at one or both ends of the carton may be adhered together, if desired. The interior side of the third top panel 270 may be adhered to the exterior side of the second stop panel 260 to complete erection of the carton 300. The erected carton 300 is illustrated in FIG. 8. Articles (not shown) may be placed in the carton 300 at any time prior to fully closing the carton 300. In the carton 300, adhering the first and second extensions 225, 245 to the respective top panels 260, 270 maintains the distal side end flaps 224, 244 in the carton interior such that that they are generally parallel to the first and second side panels 220, 240.

[0037] FIG. 9A illustrates a primary blank 406 and first, second and third reinforcing blanks 408, 409, 407 for forming a carton 500 (illustrated in FIG. 10) according to a fourth embodiment of the invention. In FIG. 9A, like reference numbers to the reference numbers shown in FIG. 1A indicate like or similar elements, with the reference numbers in FIG. 9A being preceded by "4." The primary blank 406 and the first and second reinforcing blanks 408, 409 may be substantially identical to the blanks 6, 8, 9, respectively.

[0038] The third reinforcing blank 407 is designed to overlie and reinforce a central section of primary blank 406. The third reinforcing blank 407 comprises a series of sequentially arranged reinforcing panels 471, 472, 473, 474, 475, 476, 477. During erection, the third reinforcing blank 407 is placed over the primary blank 406 so that the reinforcing panels 471, 472, 473, 474, 475, 476, 477 overlie and are adhered to the panels 460, 420, 430, 440, 450, 470 of the primary blank 460. The resultant multi-ply blank 410 formed from the blanks 406, 407, 408, 409 is shown in FIG. 9B. In FIG. 9B, the third reinforcing blank 407 is centrally located between the first and second reinforcing blanks 408, 409, although other orientations are possible.

[0039] Referring to FIG. 9B, the multi-ply blank 410 can be erected into a carton using the method shown in FIGS. 2A-2E. FIG. 10 illustrates the carton 500 erected from the blank 410. FIG. 11 illustrates the carton 500 after opening, and shows the position of the reinforcing blanks 407, 409 in the erected carton.

[0040] FIGS. 12A-12E illustrate an alternative method of erecting the blank 10 illustrated in FIG. 1B into a carton. The method shown in FIGS. 12A-12E is essentially identical to the method shown in FIGS. 2A-2E, except that in FIG. 12B, the first and second distal side end flaps 24, 44 are folded over flat about the longitudinal fold lines 25, 45, respectively. The interior sides of the distal side end flaps 24, 44 are then in a position to be adhered to the interior sides of the reinforcing end flaps 22', 42', respectively.

[0041] Referring to FIGS. 12C and 12D, the exterior sides of the end flaps 32, 52 may be adhered to the second distal side end flaps 44, and the exterior sides of the end flaps 32, 62 may be adhered to the first distal side end flaps 24. FIG. 12E illustrates closing of the opposite sides of the carton so that the third top panel 70 can be adhered to the second top panel 60.

[0042] According to the above embodiments, a primary blank can be reinforced at selected locations by reinforcing blanks. The carton formed from the resulting multi-ply blank can accordingly have enhanced strength and rigidity at selected sections of the carton. According to the present invention, selected reinforcement of specific areas of the primary blank can produce a high strength carton while using relatively small amounts of board.

[0043] One or more of the reinforcing blanks discussed above may be omitted in the above embodiments, for example, if a lesser amount of reinforcement is sufficient for a particular application.

[0044] In accordance with the exemplary embodiments, the cartons may be constructed of paperboard, for example. The blanks, and thus the cartons, can also be constructed of other materials, such as cardboard, solid unbleached sulfate (SUS) board, or any other material having properties suitable for enabling the carton to function at least generally as described above.

[0045] In one exemplary embodiment, the primary and reinforcing blanks are formed from SUS board. The primary blank has a caliper in the range of about 14-30 point, which may be more specifically in the range of about 18-26 point. The caliper

of the reinforcing blanks can be slightly less than the primary blank, and can be in the range of about 14-20 point.

[0046] The blanks can also be laminated to or coated with one or more additional sheet-like materials at selected panels or panel sections. One or more panels of the blanks discussed above can be coated with varnish, clay, or other materials, either alone or in combination. The coating may then be printed over with product, advertising, and other information or images. The blanks may also be coated to protect any information printed on the blanks. The blanks may be coated with, for example, a moisture barrier layer, on either or both sides of the blanks.

[0047] In accordance with the above-described embodiments of the present invention, a fold line can be any substantially linear, although not necessarily straight, line of disruption or other form of weakening that facilitates folding therealong.

[0048] In the present specification, a “panel” or “flap” need not be flat or otherwise planar. A “panel” or “flap” can, for example, comprise a plurality of interconnected generally flat or planar sections.

[0049] The above embodiments may be described as having one or more panels adhered together by glue. The term “glue” is intended to encompass all manner of adhesives commonly used to secure carton panels in place.

[0050] The foregoing description of the invention illustrates and describes the present invention. Additionally, the disclosure shows and describes only selected embodiments of the invention, but it is to be understood that the invention is capable of use in various other combinations, modifications, and environments and is capable of changes or modifications within the scope of the inventive concept as expressed herein, commensurate with the above teachings, and/or within the skill or knowledge of the relevant art.

WHAT IS CLAIMED IS:

1. A carton blank, comprising:
a primary blank, the primary blank comprising:
a plurality of foldably connected primary panels;
a plurality of first primary end flaps, each first primary end flap being foldably connected to at least one of the primary panels; and
a plurality of second primary end flaps, each second primary end flap being foldably connected to at least one of the primary panels;
and
a first reinforcing blank attached to the primary blank, the first reinforcing blank comprising:
a plurality of foldably connected first reinforcing panels.
2. The carton blank of claim 1, wherein each of the first reinforcing panels is adhered to at least one of the primary panels.
3. The carton blank of claims 1 or 2, wherein the first reinforcing blank further comprises a plurality of first reinforcing flaps, each of the first reinforcing flaps being adhered to at least one of the first primary end flaps.
4. The carton blank of claims 1-3, further comprising a second reinforcing blank adhered to the primary blank.
5. The carton blank of claim 4, wherein the second reinforcing blank comprises a plurality of foldably connected second reinforcing panels, wherein each of the second reinforcing panels is adhered to at least one of the primary panels.
6. The carton blank of claim 4, wherein the second reinforcing blank comprises a plurality of foldably connected second reinforcing flaps, wherein each of the second reinforcing flaps is adhered to at least one of the second primary end flaps.

7. The carton blank of claim 4, wherein the first reinforcing blank is adhered to a first marginal area of the primary blank and the second reinforcing blank is adhered to a second marginal area of the primary blank.

8. The carton blank of claim 4, further comprising a third reinforcing blank adhered to the primary blank between the first and second reinforcing blanks.

9. The carton blank of claim 4, wherein the plurality of foldably connected primary panels comprises a first side panel, a bottom panel, a second side panel, and at least one top panel.

10. The carton blank of claim 9, wherein the bottom panel comprises a transverse fold line extending across a width of the bottom panel.

11. The carton blank of claim 1, wherein the first reinforcing blank is adhered to a first marginal area of the primary blank.

12. The carton blank of claim 1, wherein the first reinforcing blank is adhered to a central area of the primary blank.

13. The carton blank of claim 1, wherein the plurality of foldably connected primary panels comprises a first side panel, a bottom panel, a second side panel, and at least one top panel.

14. The carton blank of claim 13, wherein the plurality of first primary end flaps comprises a first proximal side end flap foldably connected to the first side panel, and a first distal side end flap foldably connected to the first proximal side end flap.

15. The carton blank of claim 14, wherein the first reinforcing blank is adhered to at least the first and second side panels.

16. The carton blank of claim 15, wherein the first reinforcing blank is adhered to the top panel, the bottom panel, and one or more of the first primary end flaps.

17. A substantially parallelepipedal carton formed from the blank of claim 13.

18. A carton blank, comprising:
a primary blank, the primary blank comprising:
a first side panel;
a bottom panel;
a second side panel;
a top panel;
a plurality of first primary end flaps disposed in a first marginal area of the primary blank; and
a plurality of second primary end flaps disposed in a second marginal area of the primary blank; and
a first reinforcing blank attached to the first marginal area of the primary blank, the first reinforcing blank comprising:
a plurality of foldably connected first reinforcing panels; and
a plurality of first reinforcing flaps.

19. The carton blank of claim 18, further comprising a second reinforcing blank adhered to the second marginal area of the primary blank.

20. The carton blank of claim 19, wherein the second reinforcing blank comprises a plurality of foldably connected second reinforcing panels and a plurality of second reinforcing flaps.

21. The carton blank of claim 19, further comprising a third reinforcing blank adhered to the primary blank and located between the first and second reinforcing blanks.

22. The carton blank of claims 18-21, wherein each of the first reinforcing panels is adhered to at least one of the first side panel, the bottom panel, the second side panel, and the top panel.

23. The carton blank of claims 18-22, wherein each of the first reinforcing flaps is adhered to at least one of the first primary end flaps.

24. The carton blank of claim 18, further comprising a second reinforcing blank adhered to a central area of the primary blank and spaced from the first reinforcing blank.

25. The carton blank of claim 18, wherein the plurality of first primary end flaps comprises a first proximal side end flap foldably connected to the first side panel; and a first distal side end flap foldably connected to the first proximal side end flap.

26. The carton blank of claim 18, wherein the first reinforcing blank is adhered to at least the first and second side panels.

27. The carton blank of claim 26, wherein the first reinforcing blank is adhered to at least the top panel, the bottom panel, and one or more of the first primary end flaps.

28. A substantially parallelepipedal carton formed from the blank of claim 18.

29. A carton formed from a primary blank and at least a first reinforcing blank, comprising:

a first side panel;

a bottom panel;

a second side panel;

a top panel;

at least one first end flap at least partially closing a first end of the carton; and

at least one second end flap at least partially closing a second end of the carton, wherein

the first reinforcing blank is adhered to the primary blank at the first end of the carton, at which end the carton is multi-ply.

30. The carton of claim 29, wherein at least a part of the first reinforcing blank extends across the first end of the carton.

31. The carton of claims 29 or 30, wherein the first reinforcing blank is adhered to at least the first and second side panels.

32. The carton of claims 29-31, wherein the first reinforcing blank is adhered to at least the top panel and the bottom panel.

33. The carton of claims 29-32, further comprising a second reinforcing blank adhered to the primary blank at the second end of the carton, at which end the carton is multi-ply.

34. The carton of claim 33, further comprising a third reinforcing blank adhered to the primary blank and located between the first and second reinforcing blanks.

35. The carton of claims 29-34, wherein the bottom panel includes a transverse fold line extending across a width of the bottom panel.

36. The carton of claims 29-35, wherein the top panel comprises a first top panel adhered to a second top panel.

37. A method of forming carton, comprising:
providing a primary blank, the primary blank comprising:
a plurality of foldably connected primary panels;
a plurality of first primary end flaps; and
a plurality of second primary end flaps; and
providing a first reinforcing blank, the first reinforcing blank comprising a plurality of foldably connected first reinforcing panels;
adhering the first reinforcing blank to the primary blank to form a multi-ply blank; and
folding the multi-ply blank along one or more fold lines.

38. The method of claim 37, wherein the plurality of first primary end flaps is foldably connected along a first longitudinal fold line, and the plurality of second primary end flaps is foldably connected along a second longitudinal fold line.

39. The method of claim 38, wherein folding the multi-ply blank along one or more fold lines comprises:
folding the plurality of first primary end flaps about the first longitudinal fold line; and
folding the plurality of second primary end flaps about the second longitudinal fold line.

40. The method of claims 37-39, wherein adhering the first reinforcing blank to the primary blank comprises adhering each of the first reinforcing panels to at least one of the primary panels.

41. The method of claims 37-40, wherein the first reinforcing blank further comprises a plurality of first reinforcing flaps, each of the first reinforcing flaps being adhered to at least one of the first primary end flaps.

42. The method of claims 37-40, further comprising adhering a second reinforcing blank to the primary blank.

43. The method of claim 42, wherein the second reinforcing blank comprises a plurality of foldably connected second reinforcing panels, wherein each of the second reinforcing panels is adhered to at least one of the primary panels.

44. The method of claim 42, further comprising adhering a third reinforcing blank to the primary blank between the first and second reinforcing blanks.

45. The method of claim 37, wherein folding the multi-ply blank along one or more fold lines comprises folding a bottom panel of the primary blank along a transverse fold line.

46. The method of claims 37-45, wherein folding the multi-ply blank along one or more fold lines comprises folding at least one extension over a top panel of the primary blank.

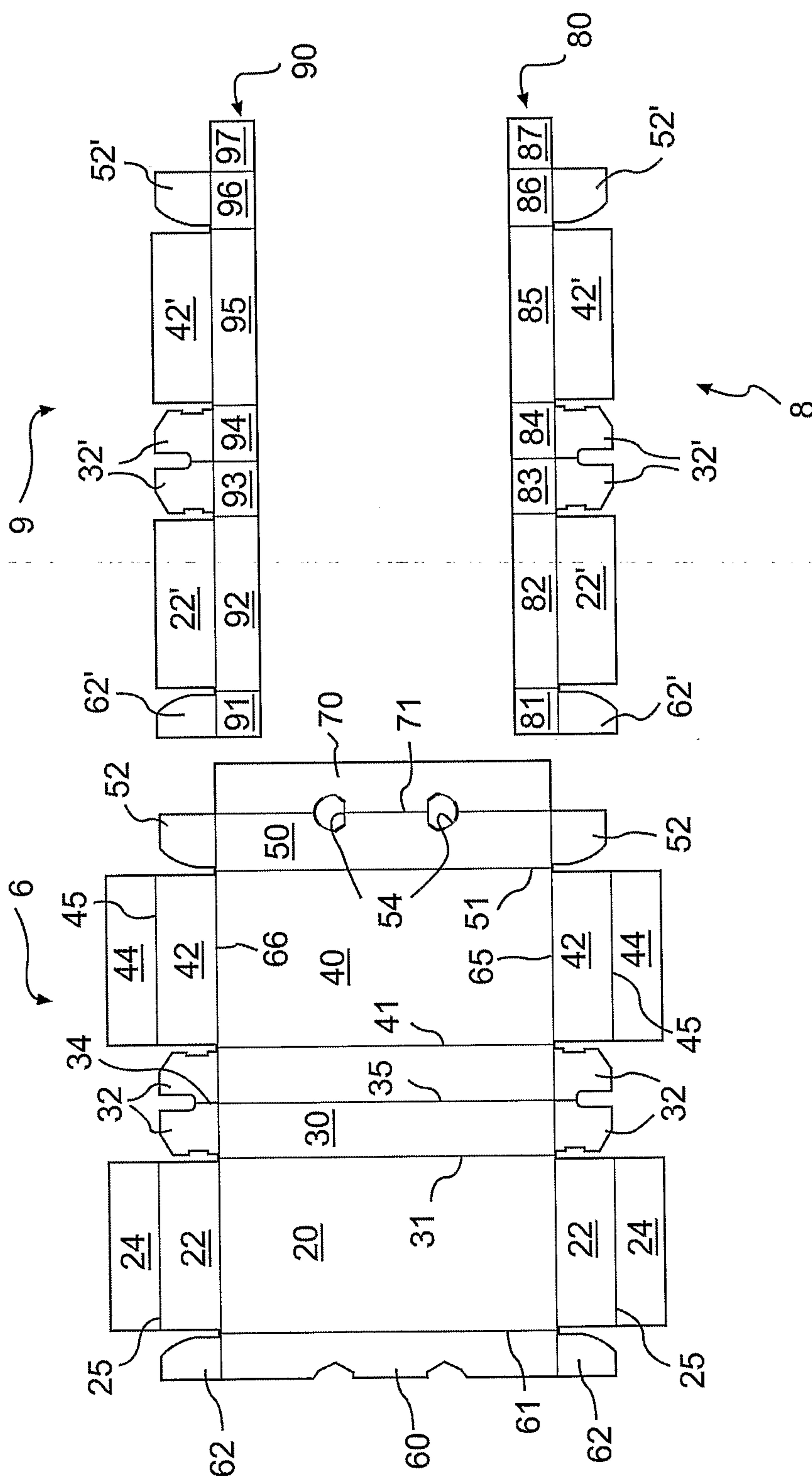
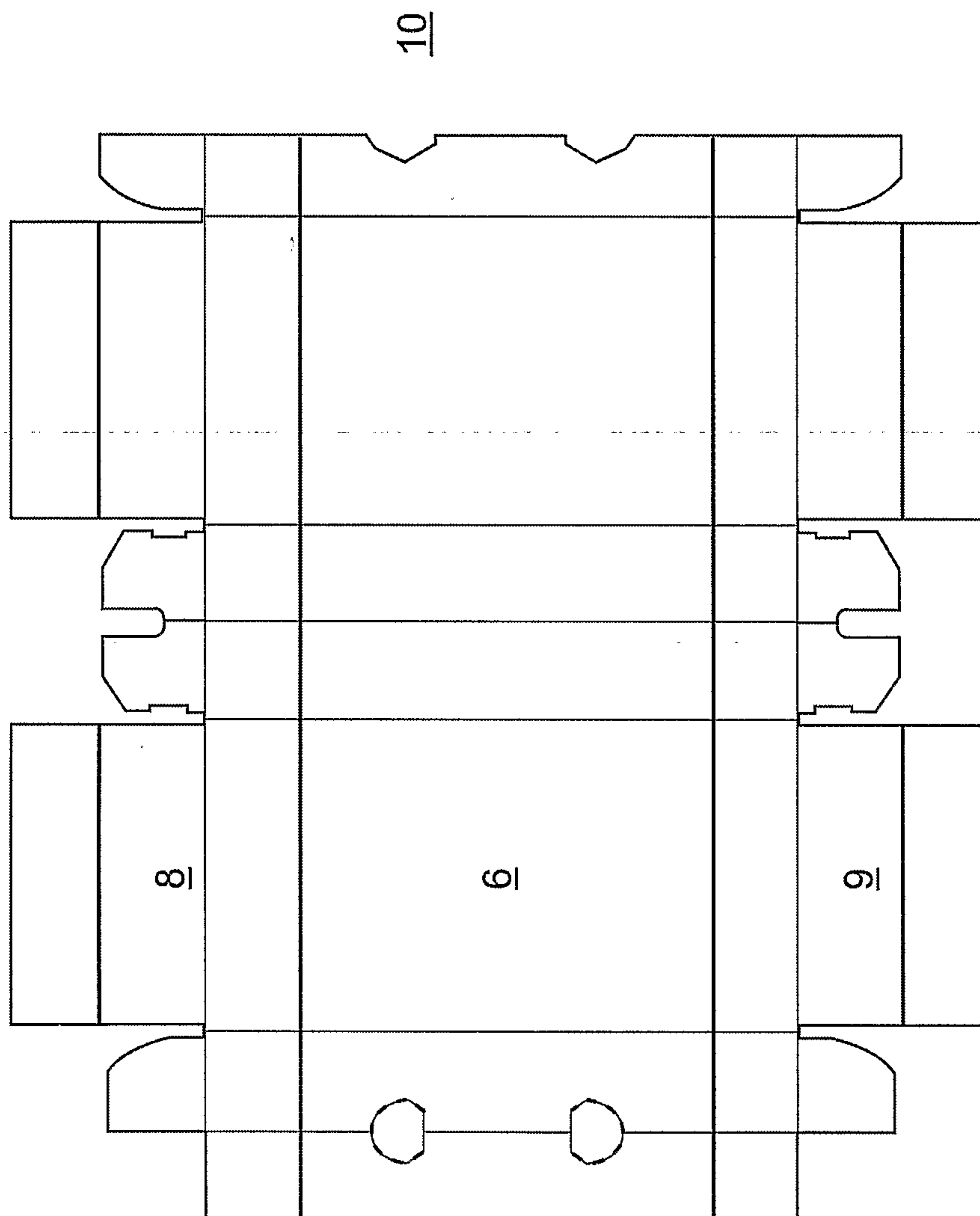
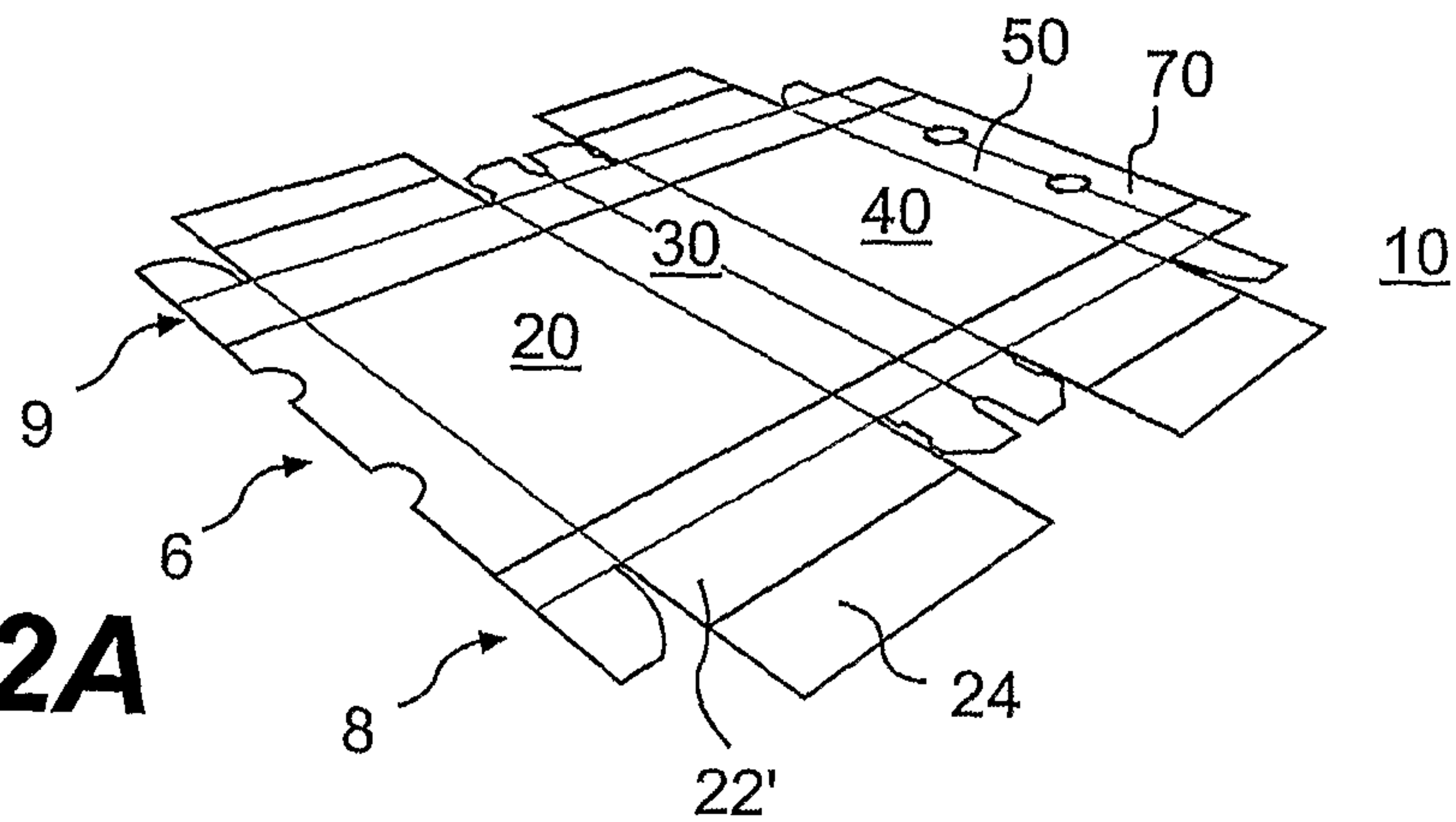
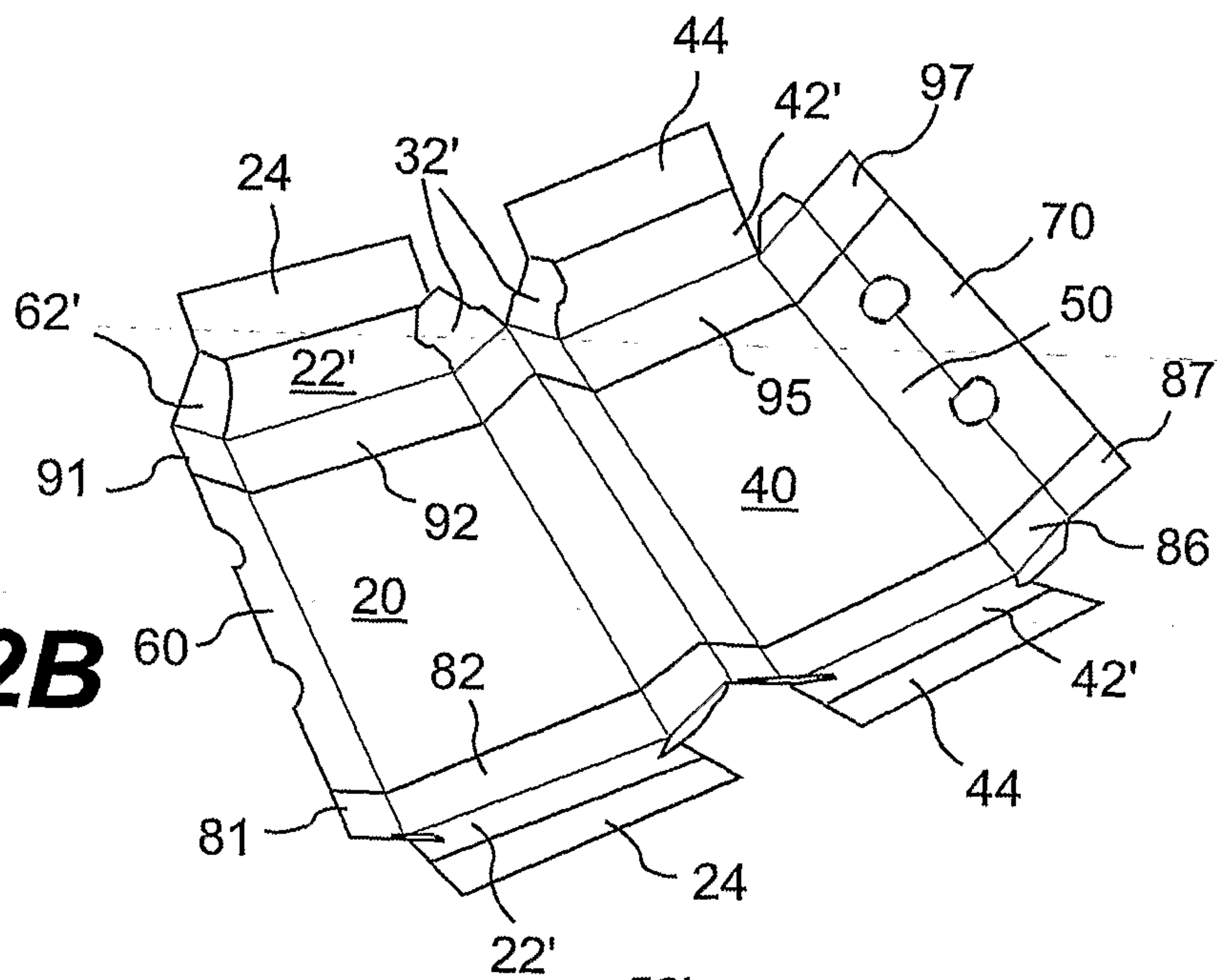
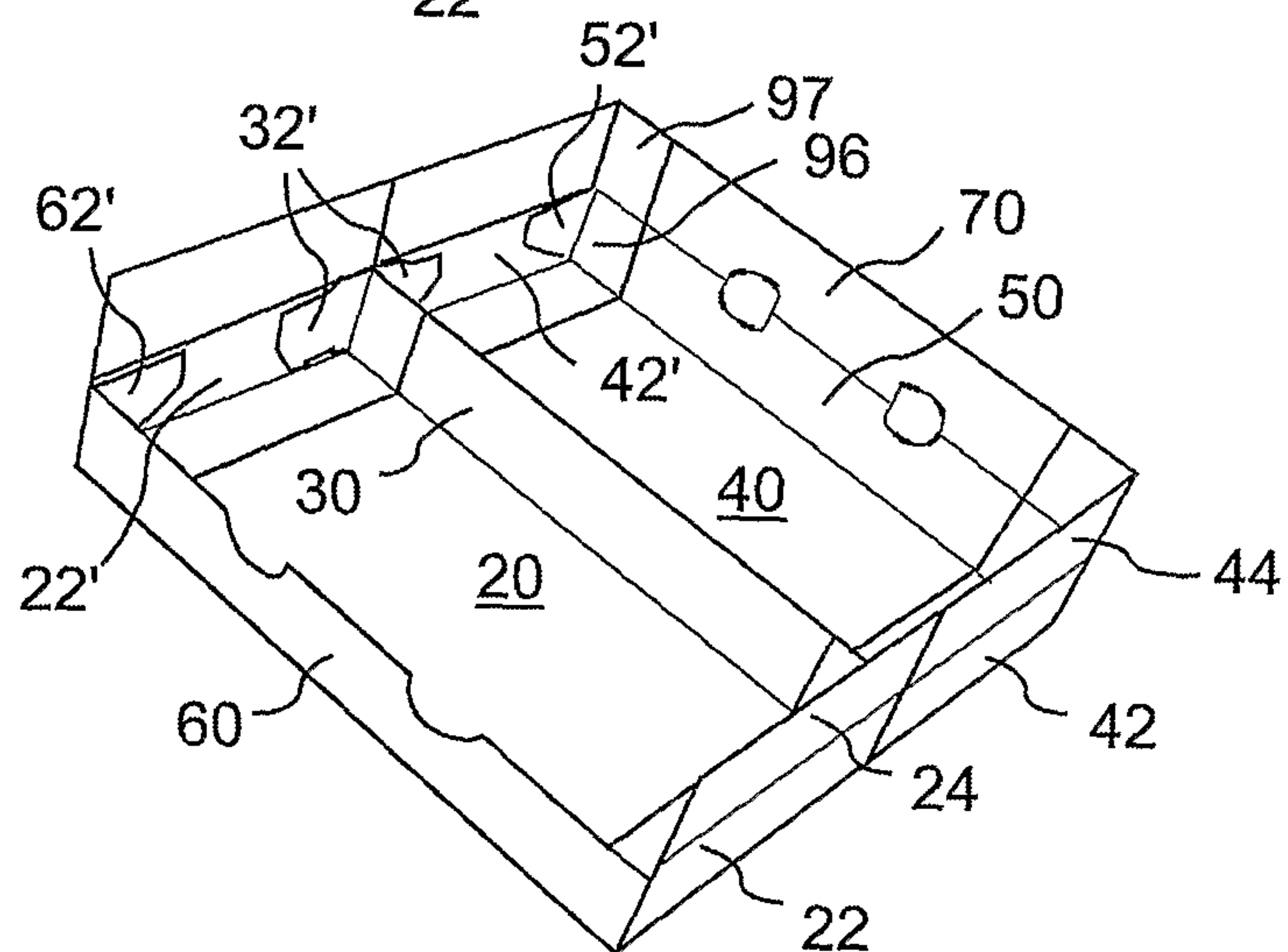


FIG. 1A

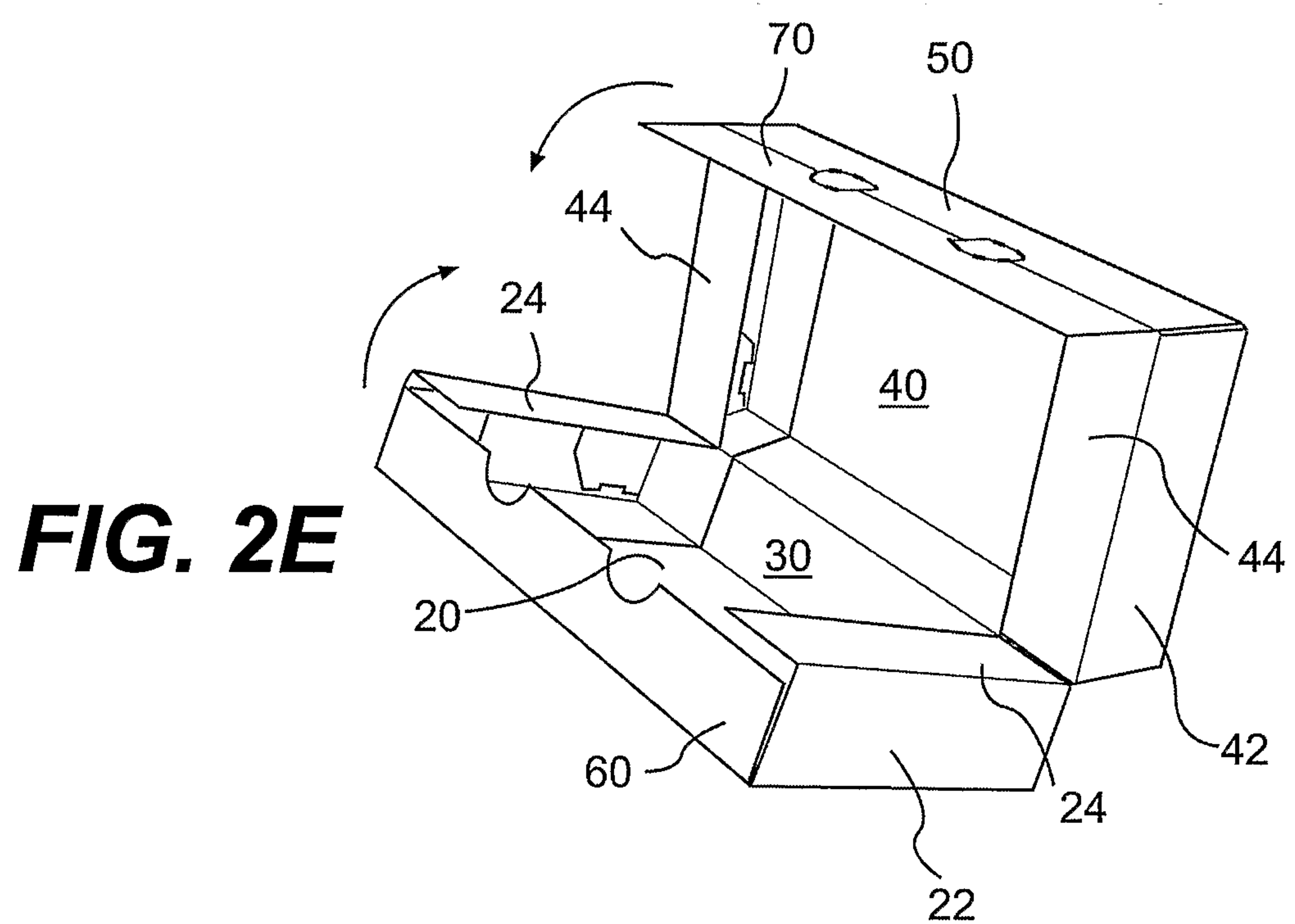
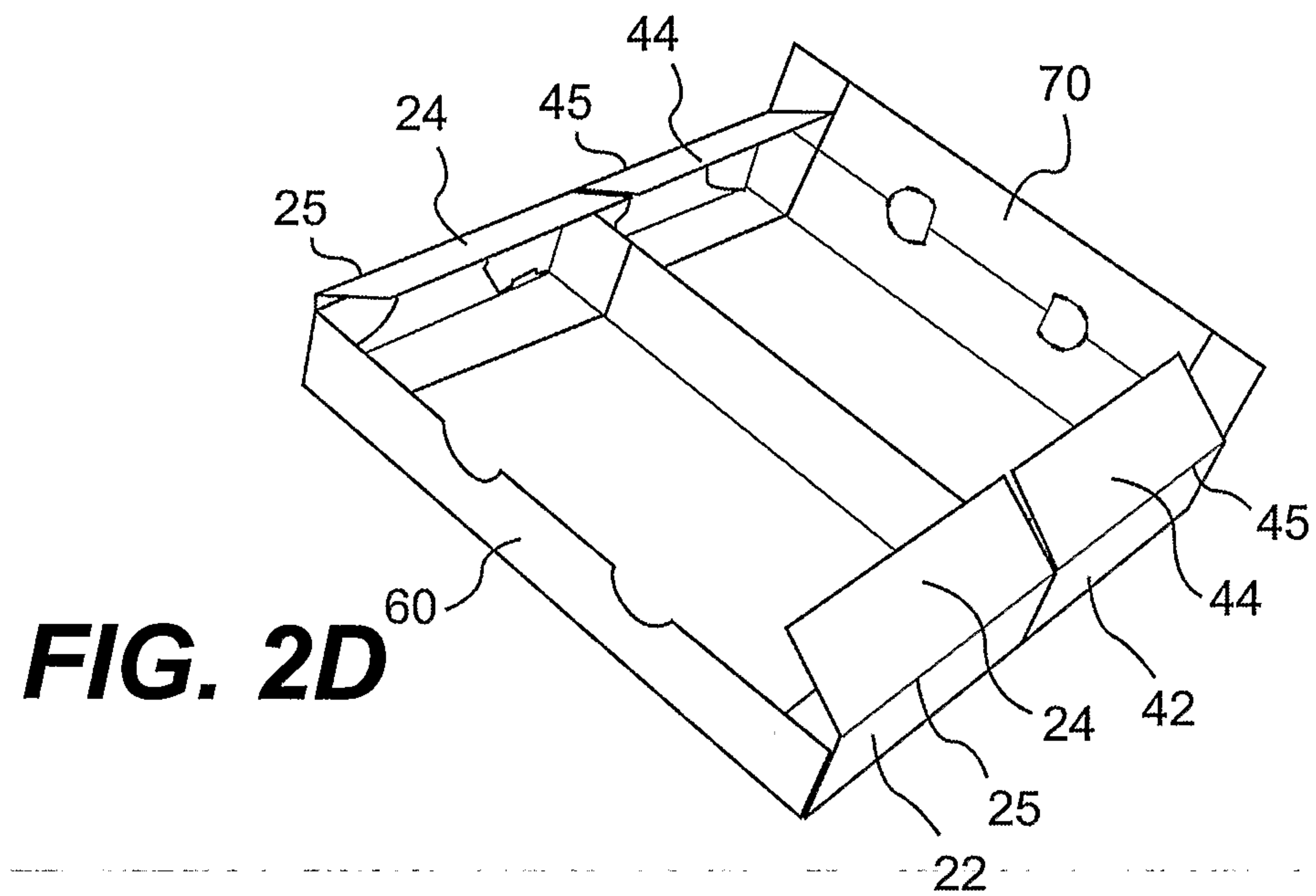
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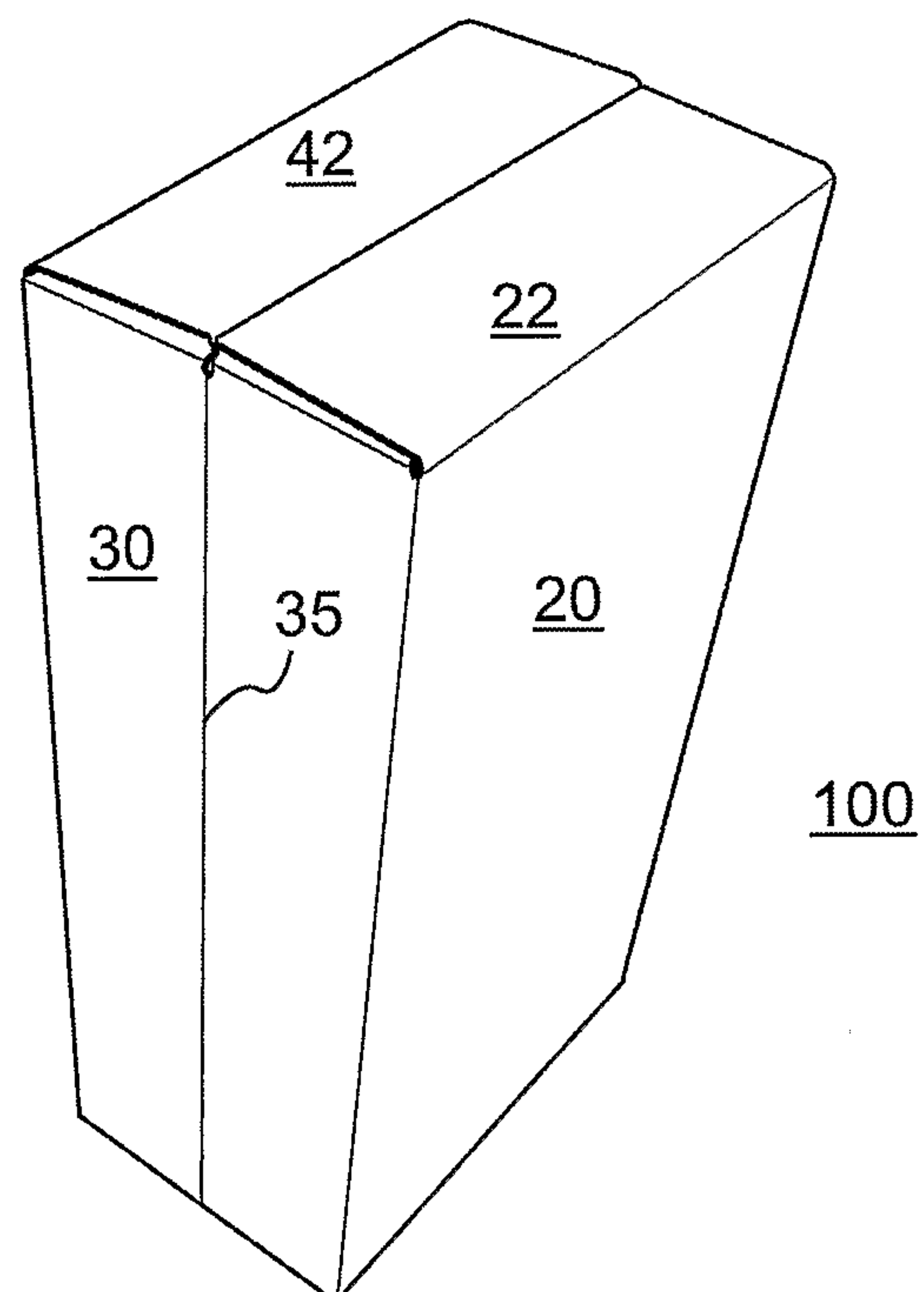
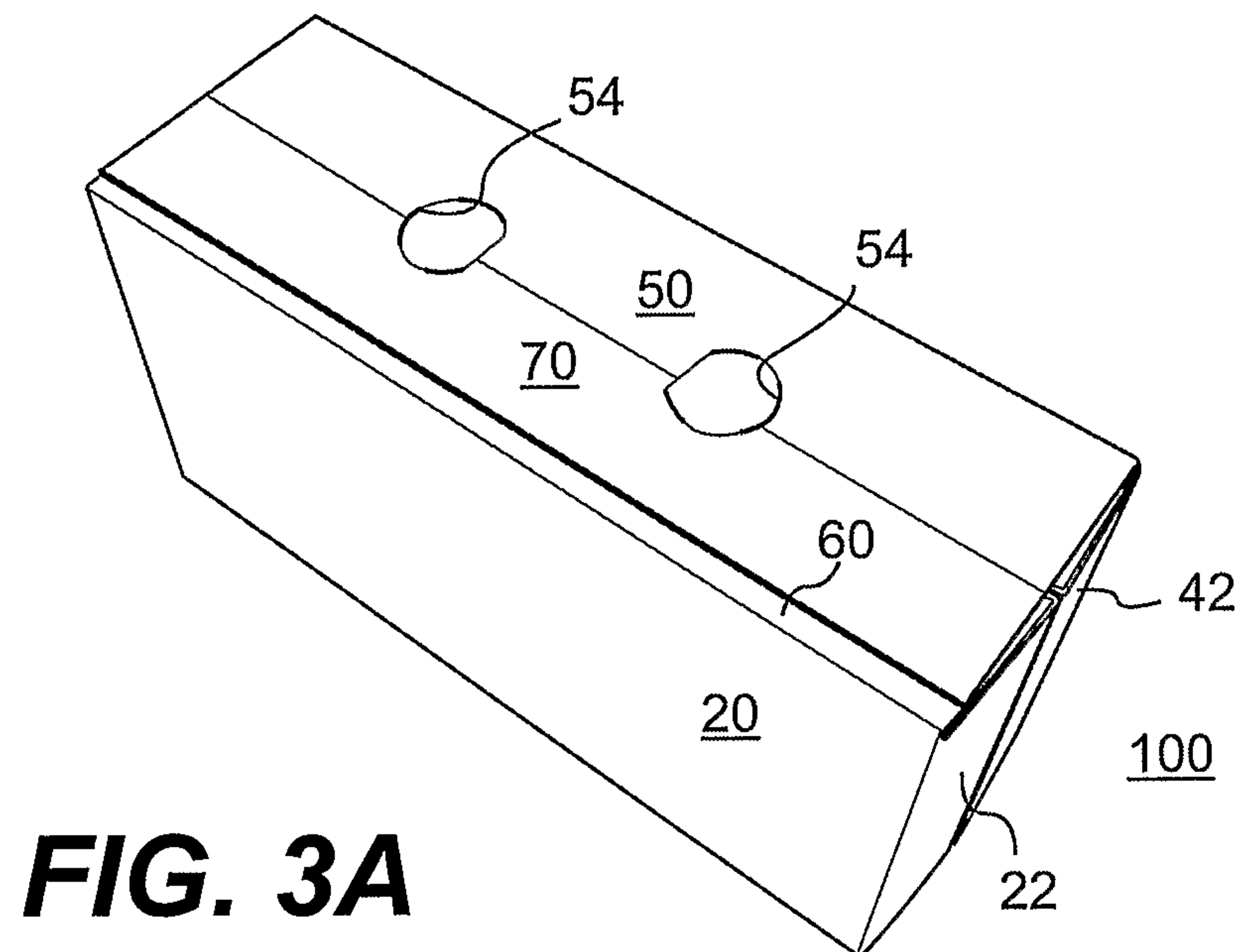
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FIG. 2A**FIG. 2B****FIG. 2C**

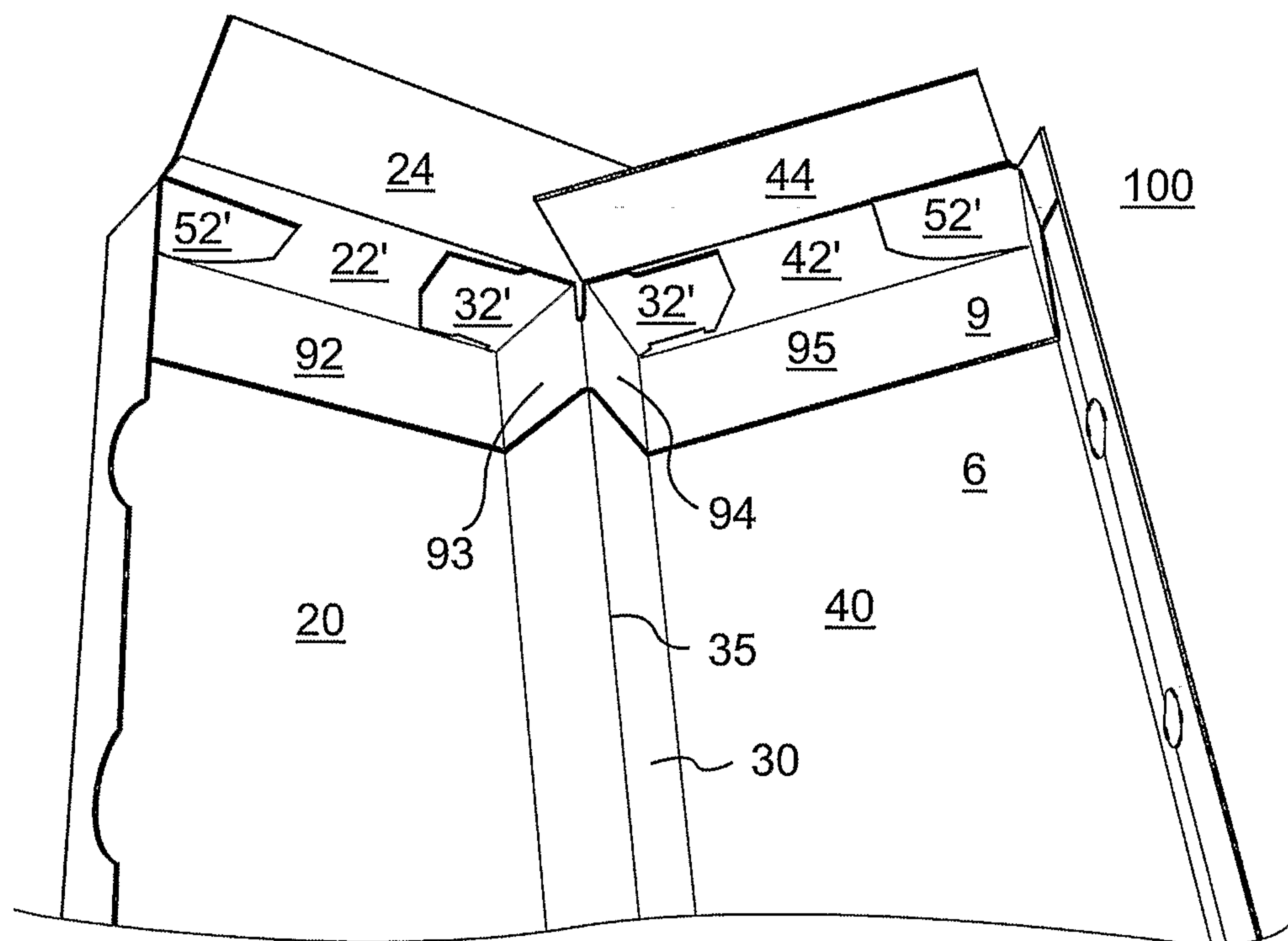
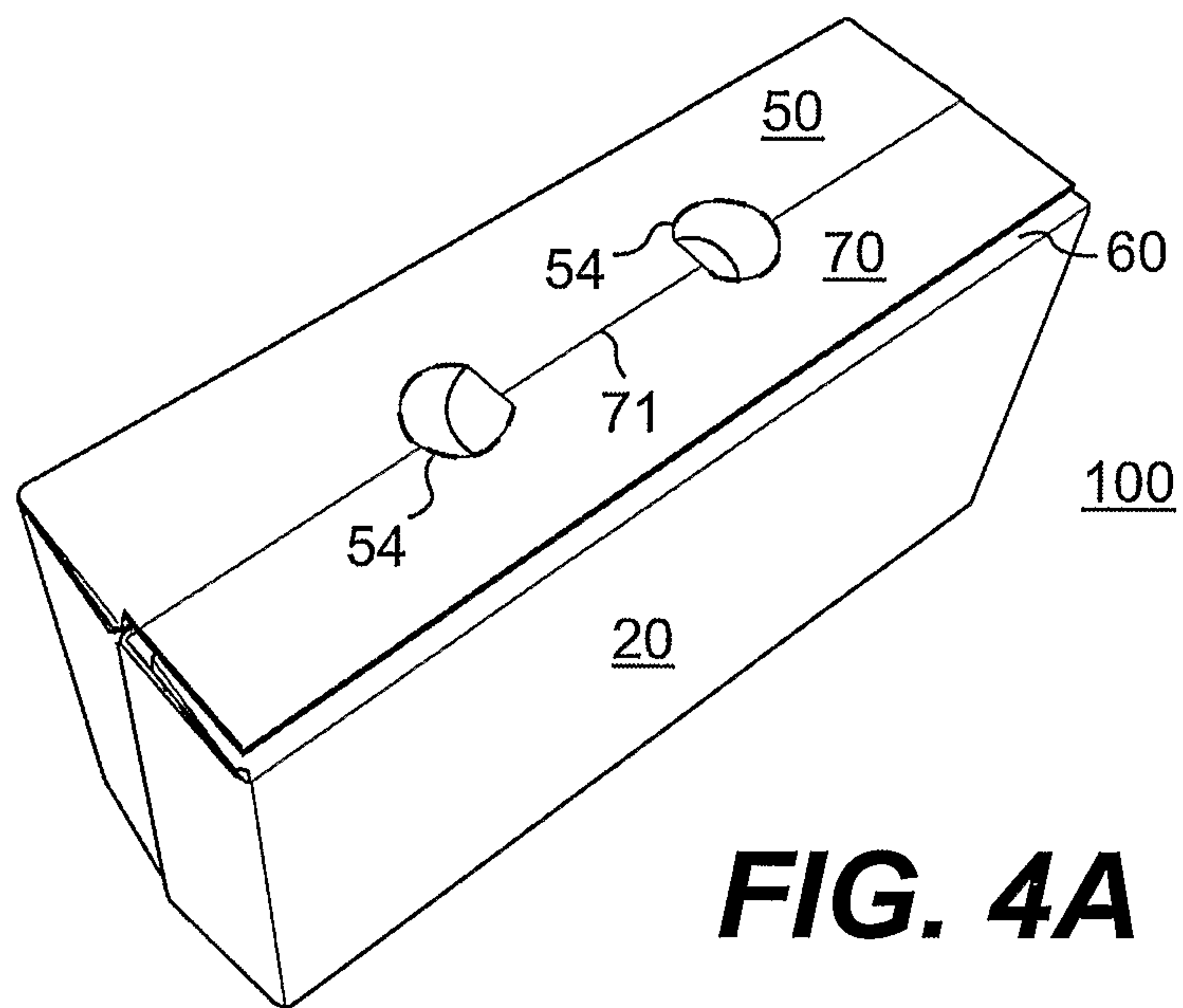
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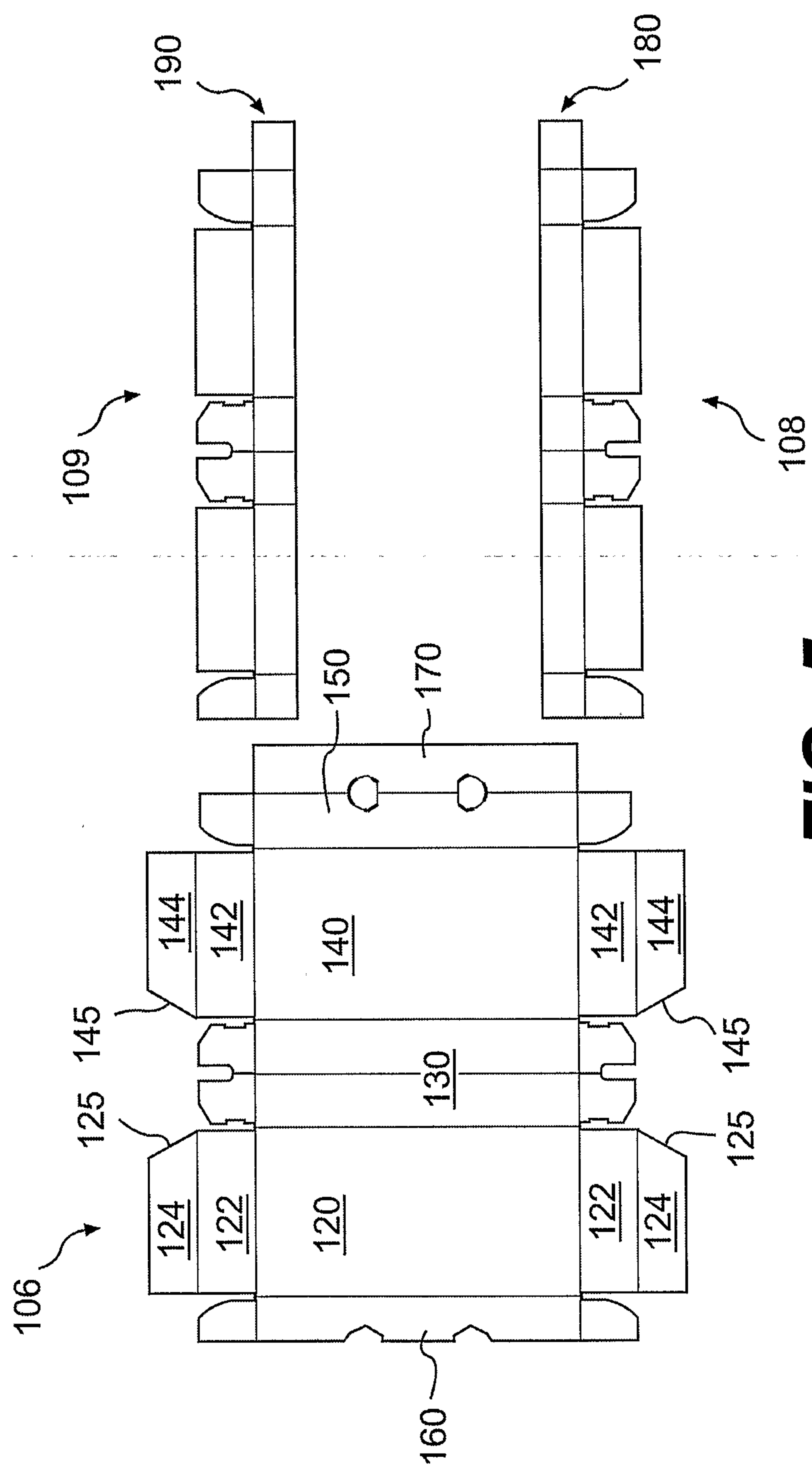
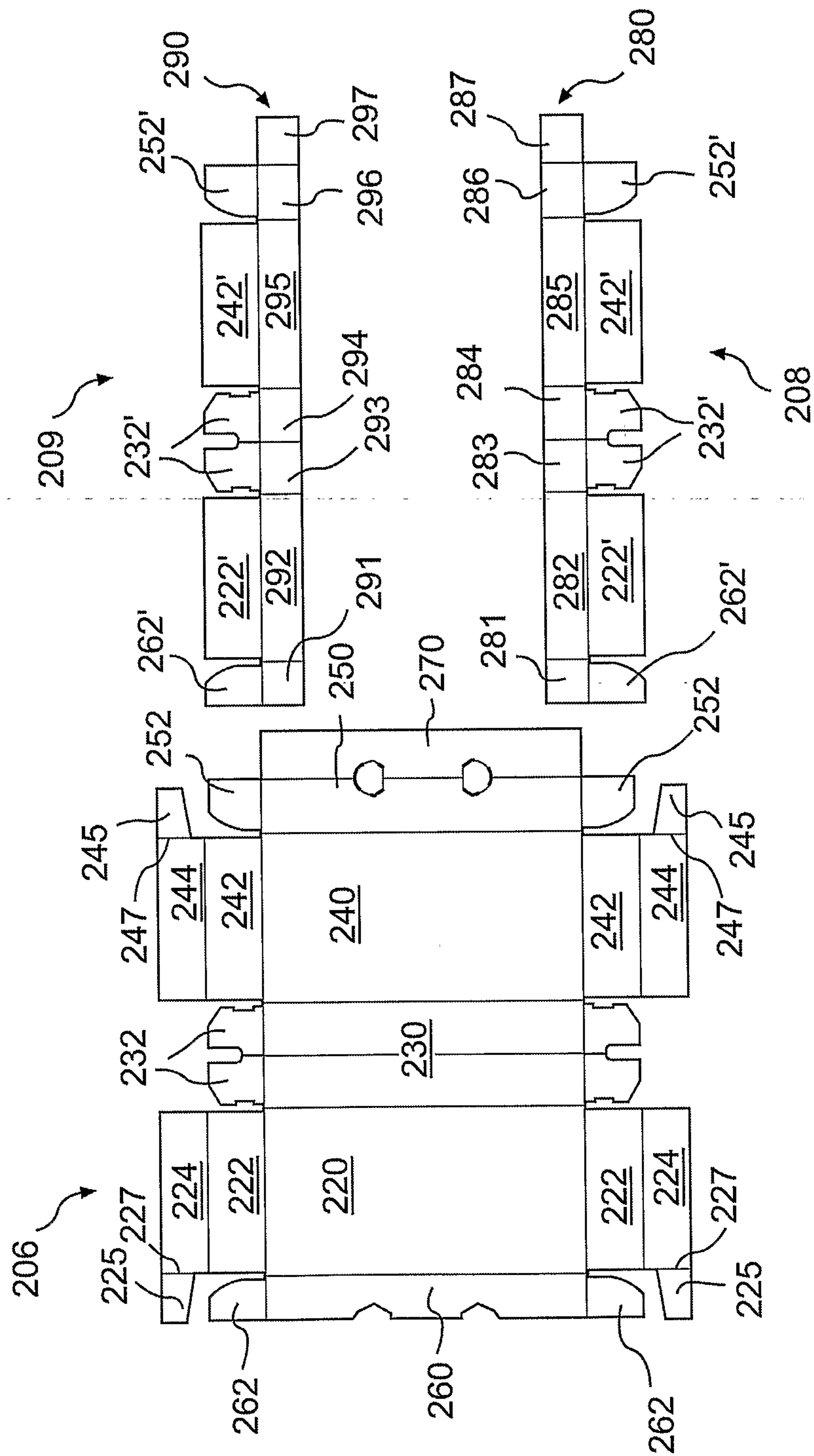


FIG. 5

**FIG. 6A**

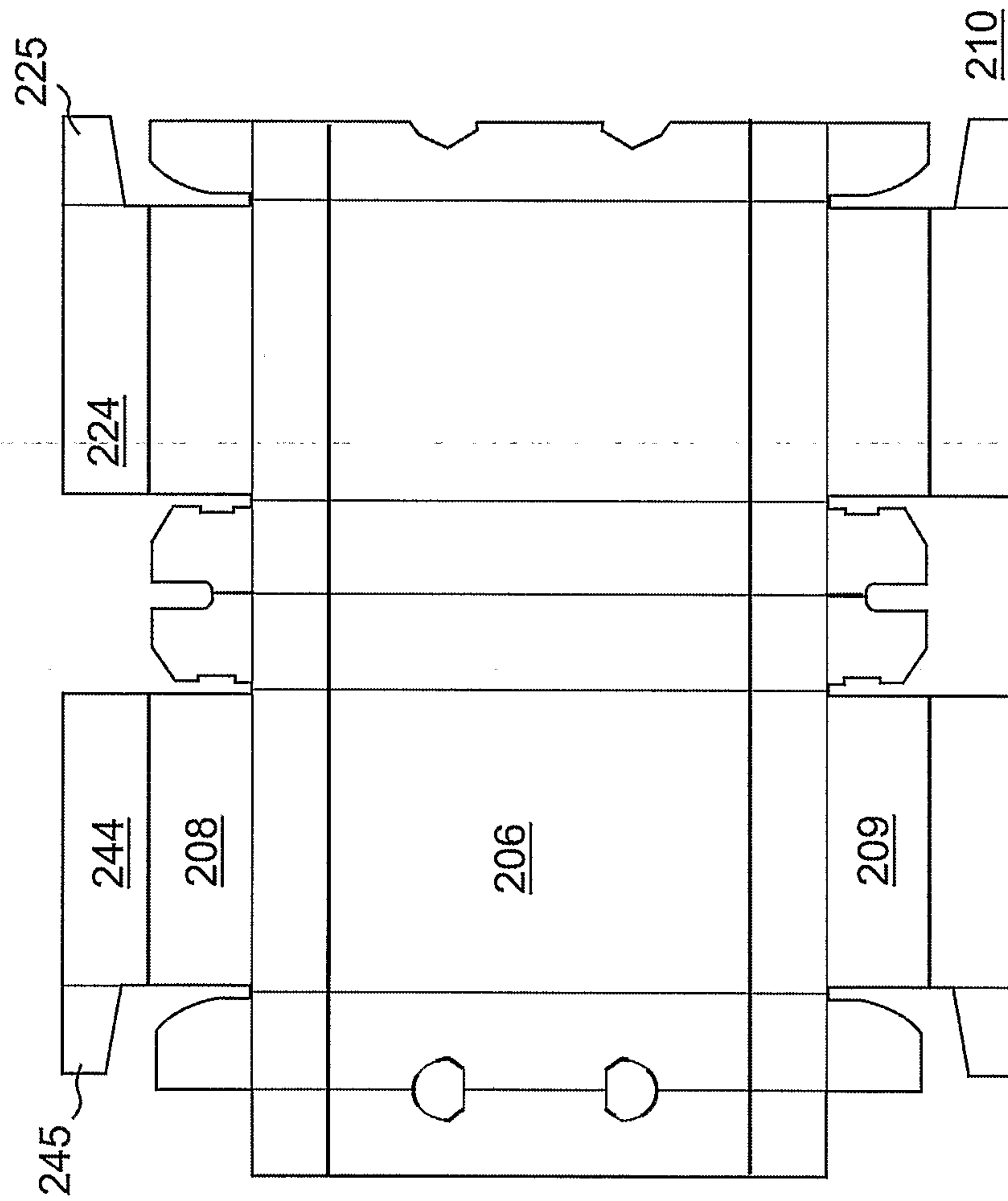
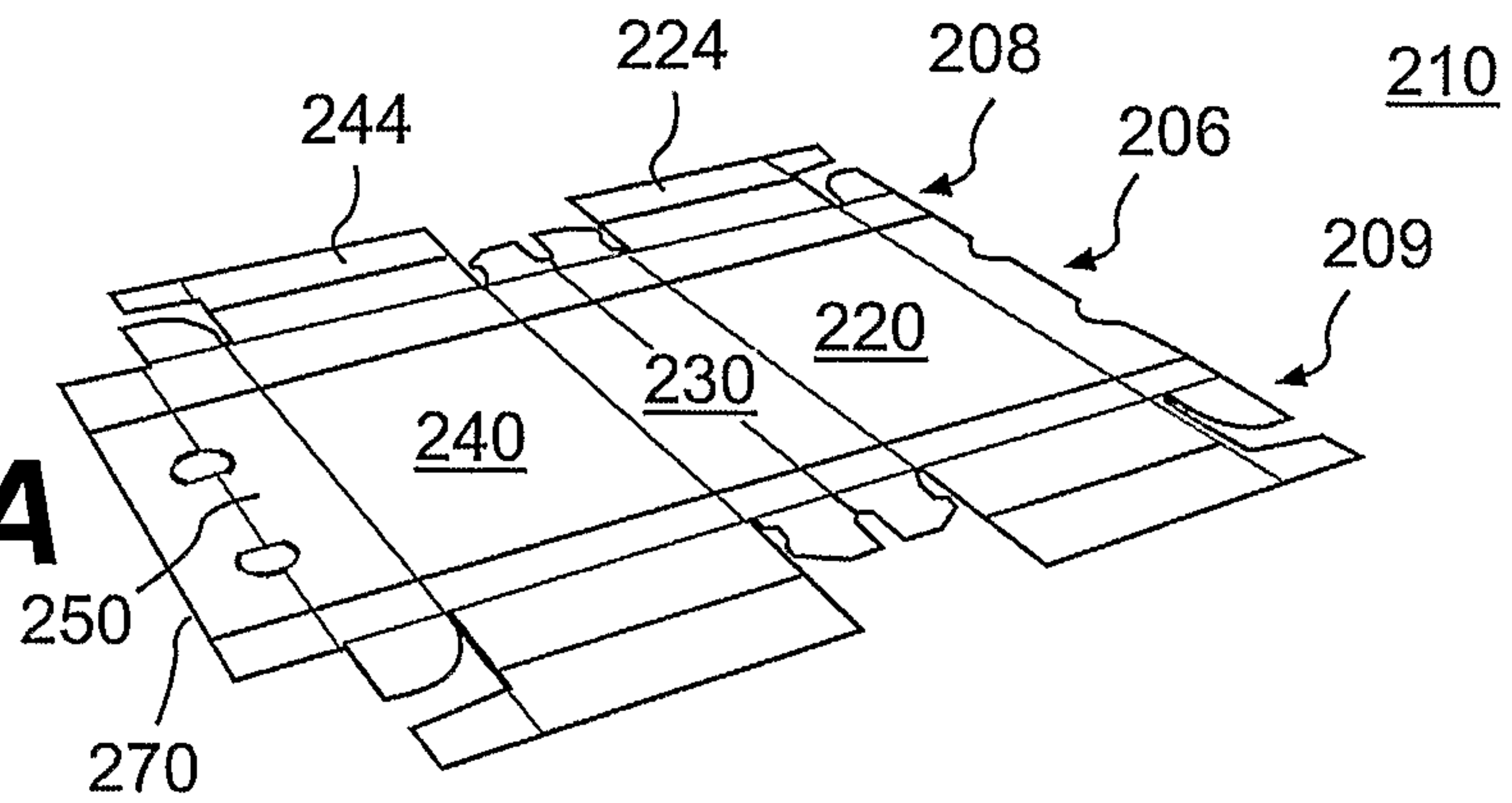
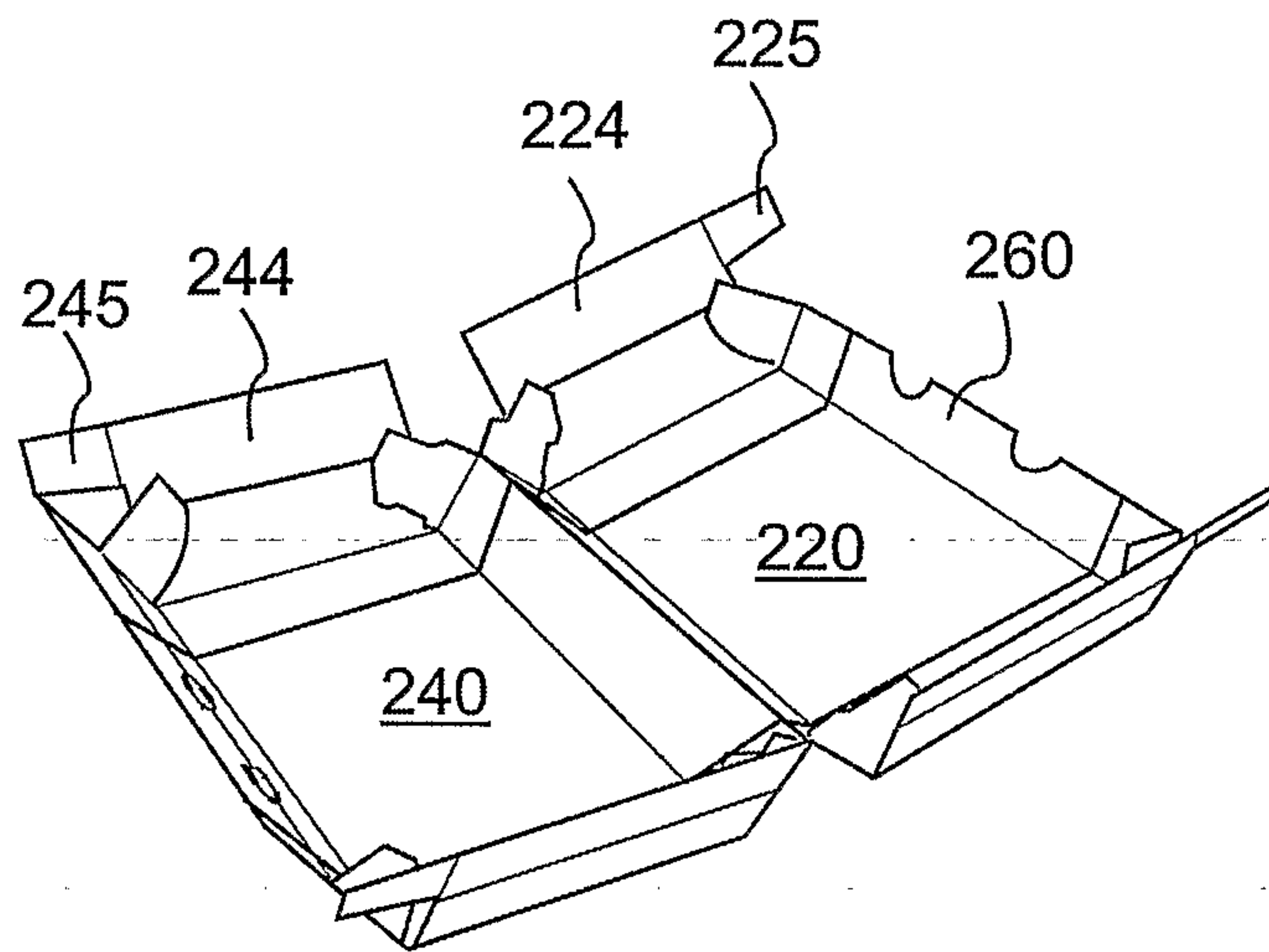
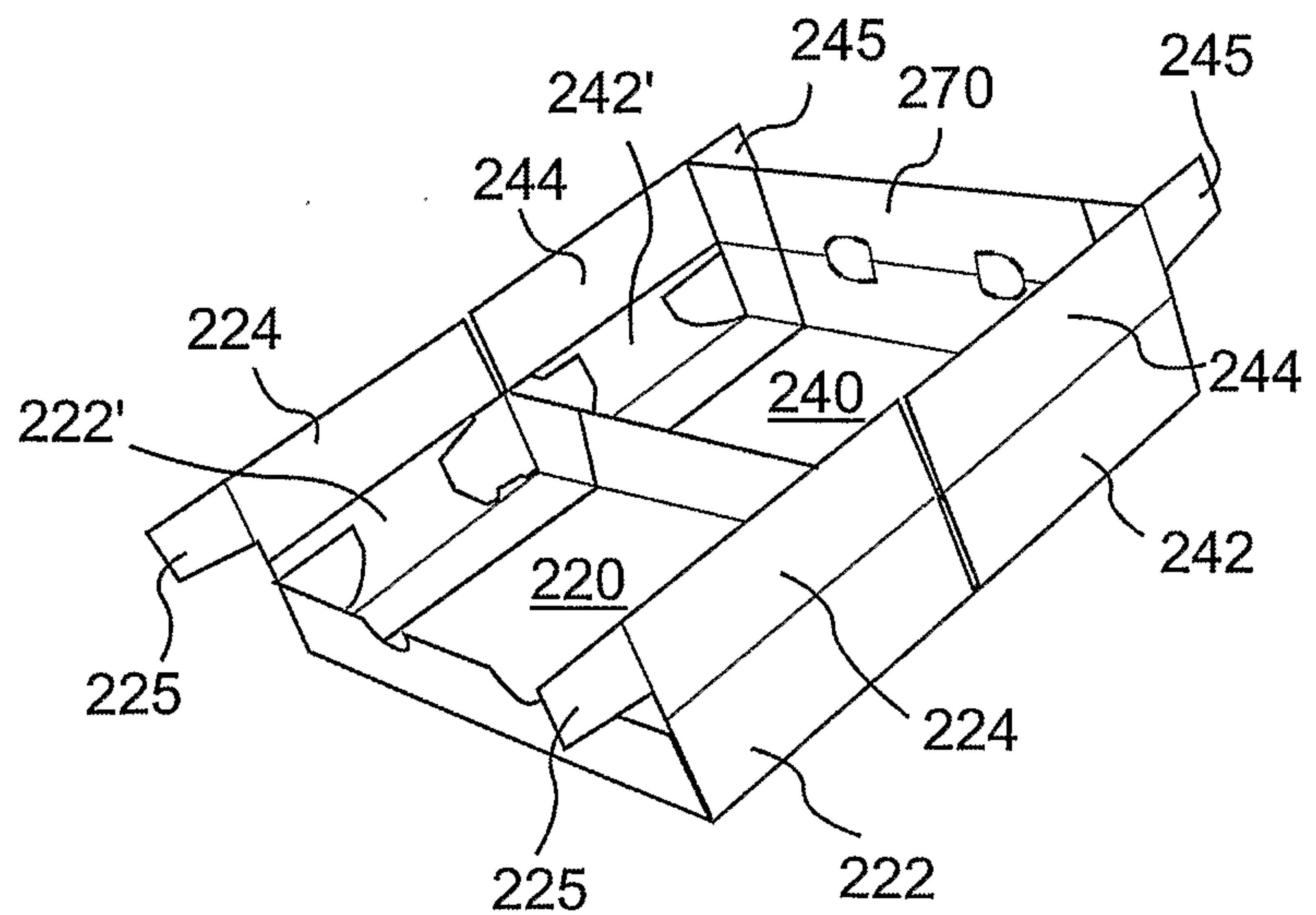
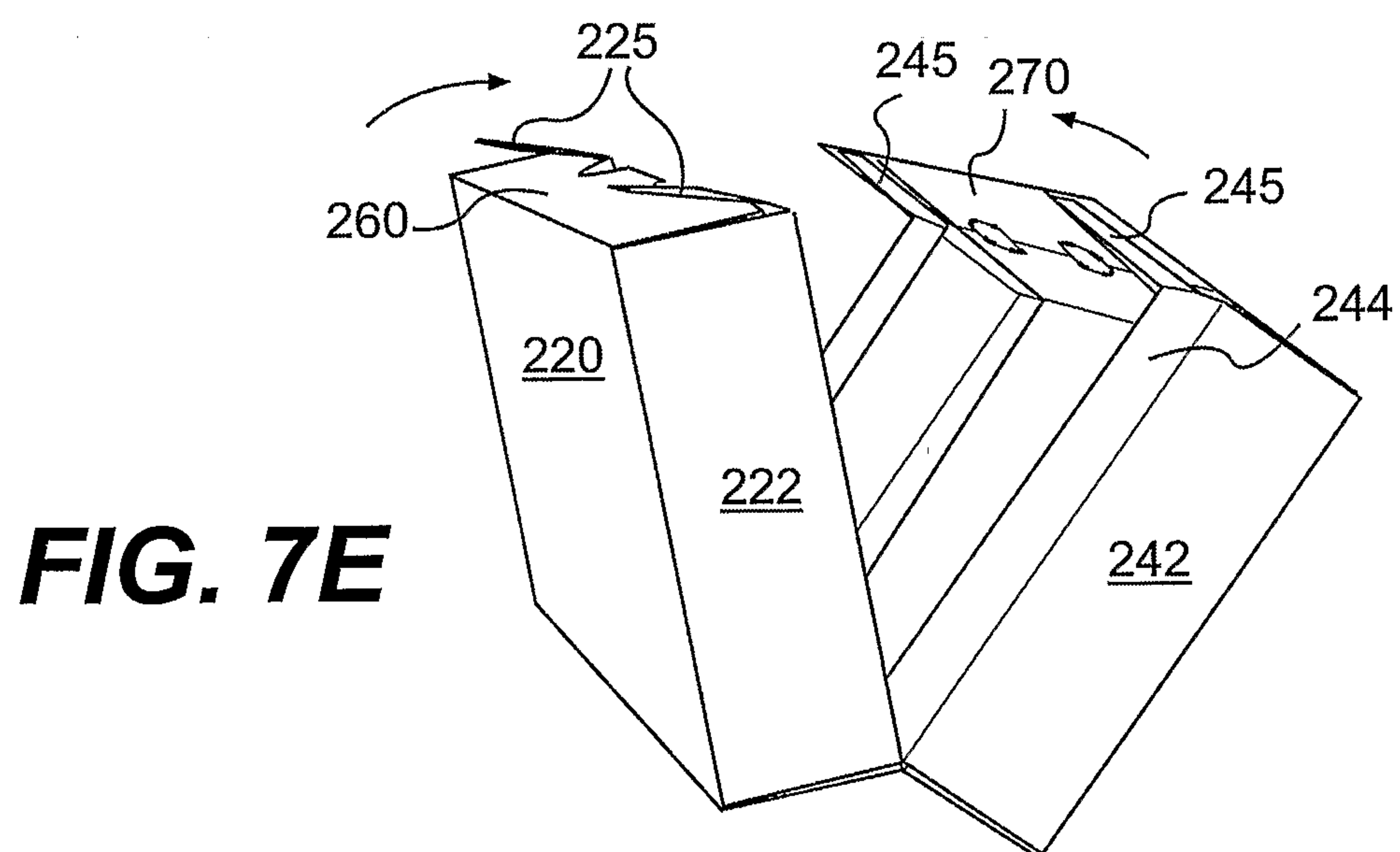
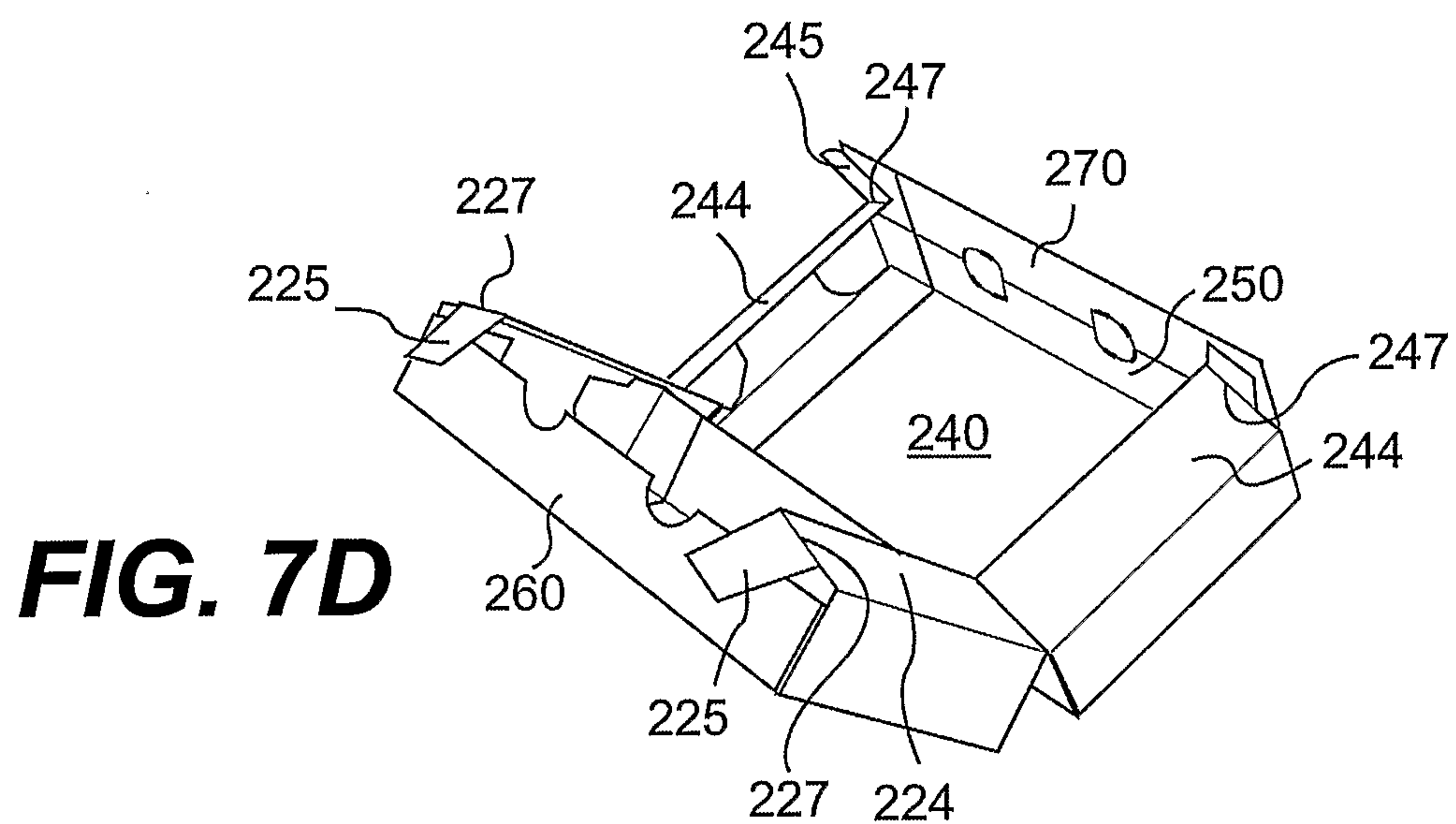


FIG. 6B

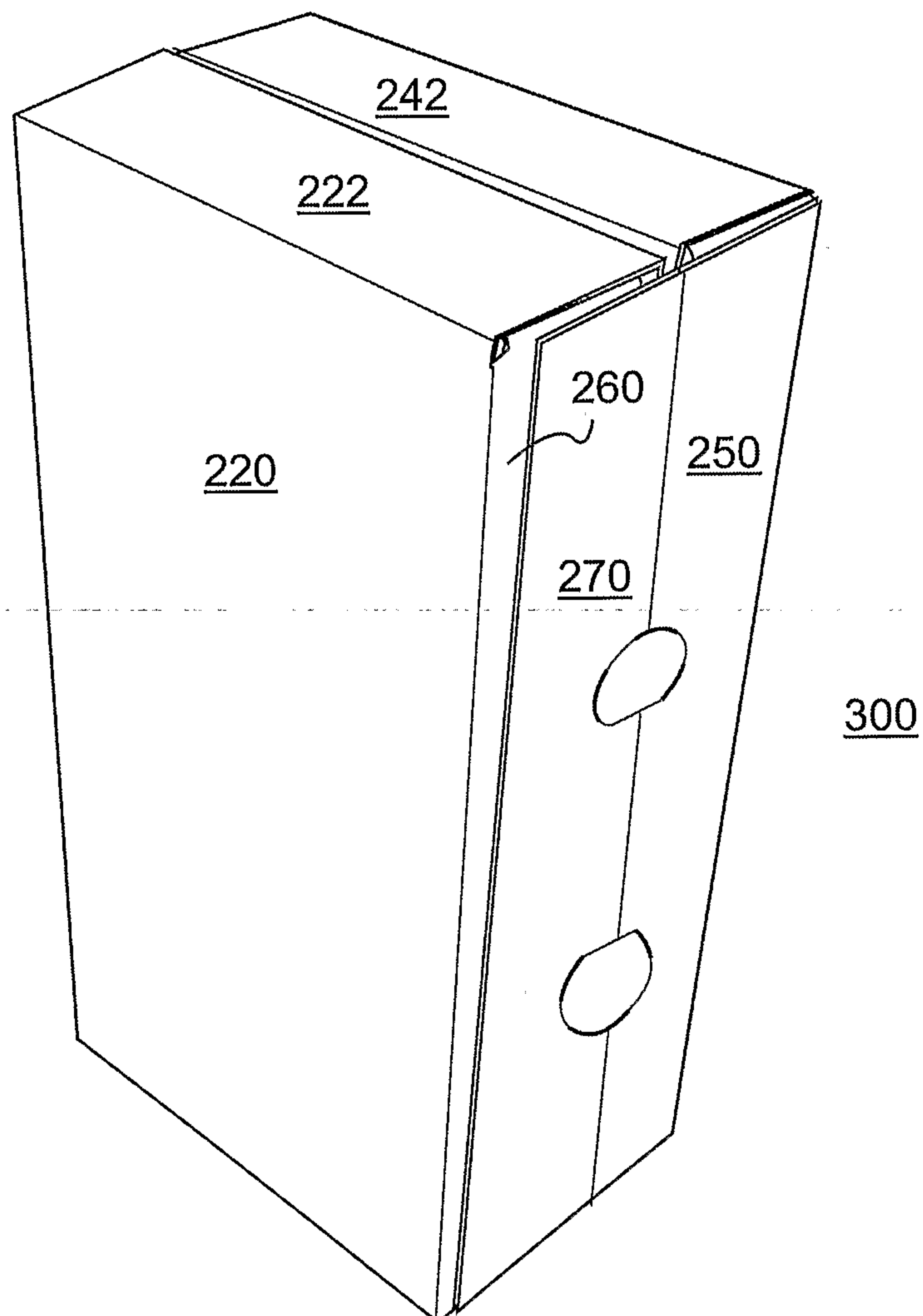
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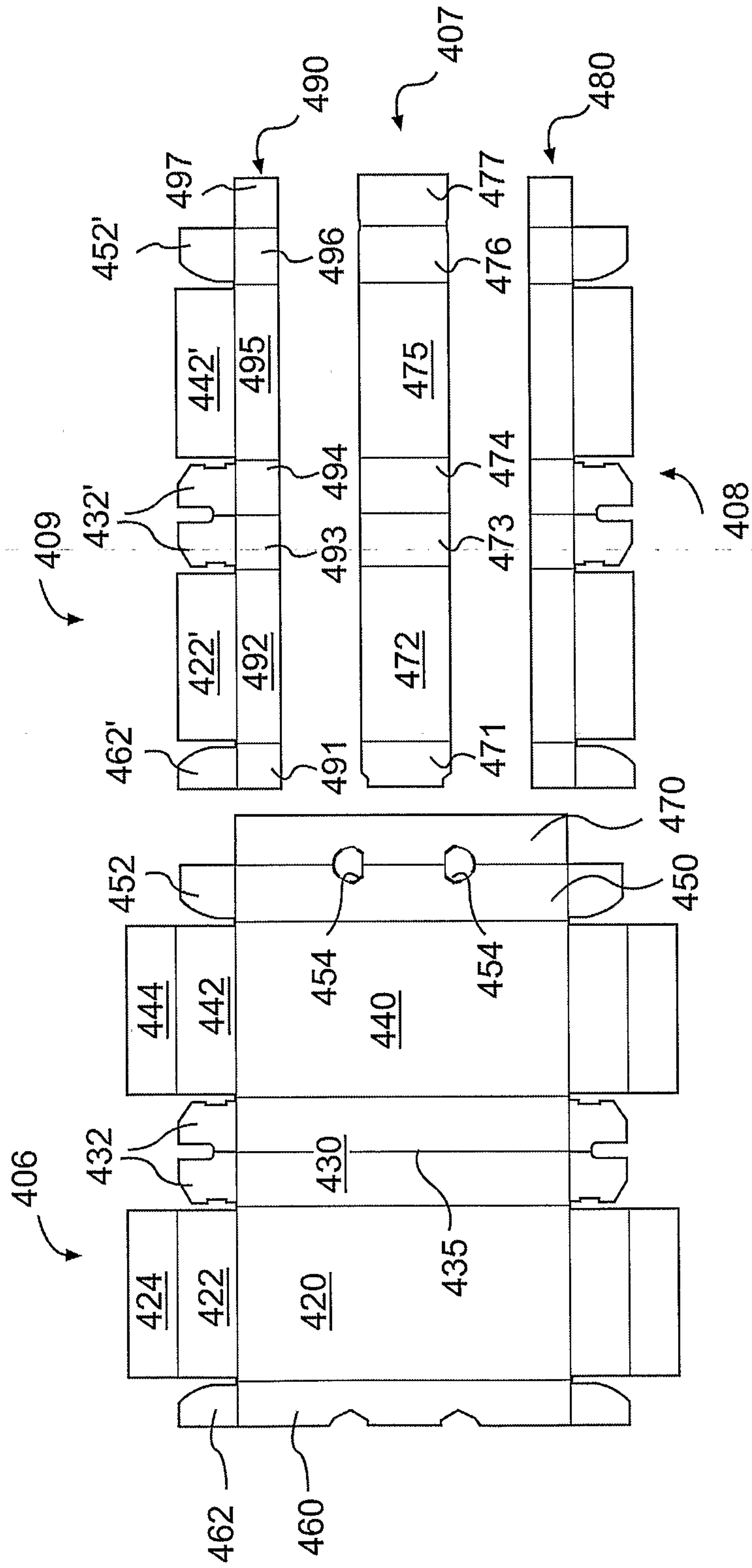
FIG. 7A**FIG. 7B****FIG. 7C**

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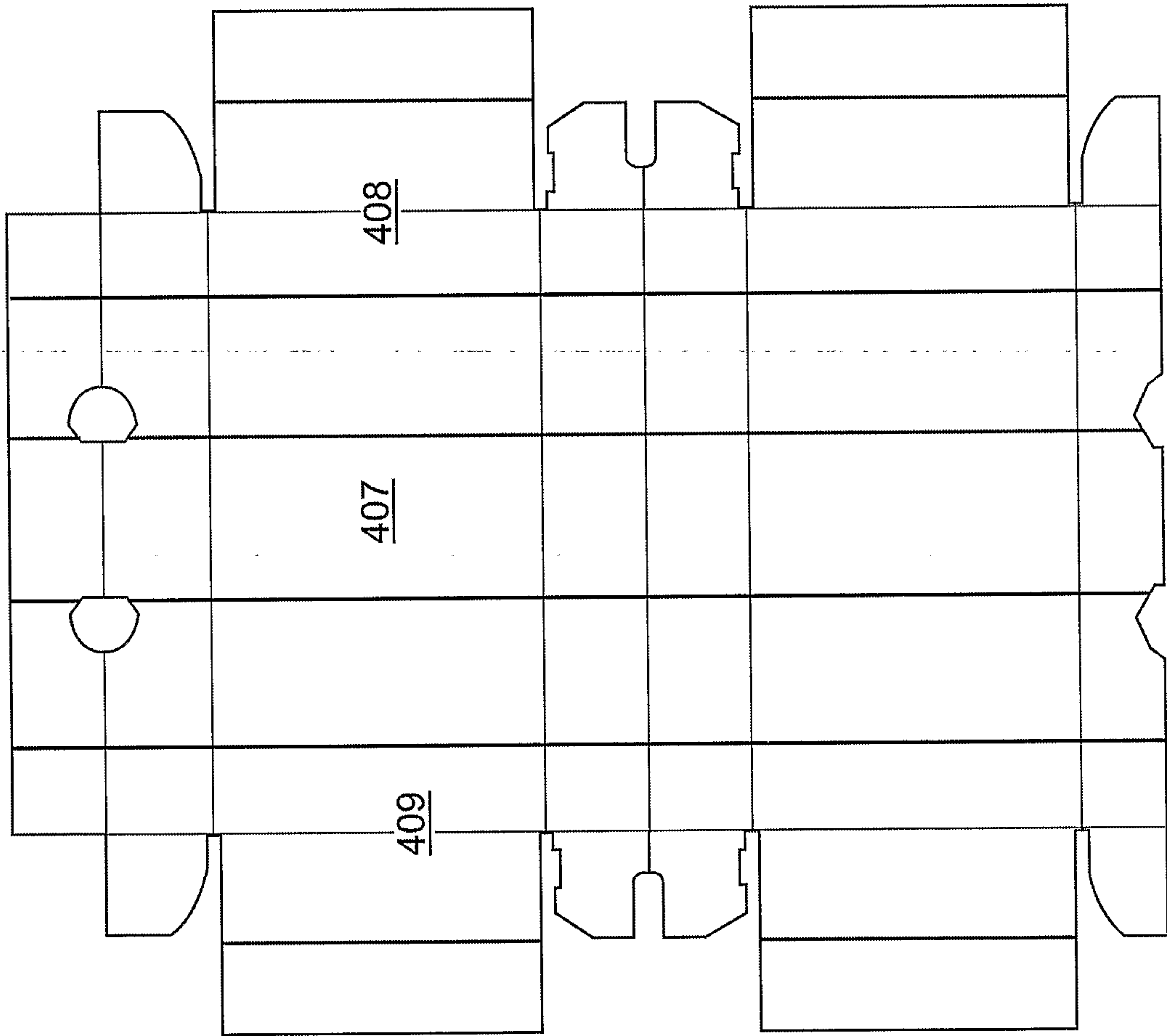


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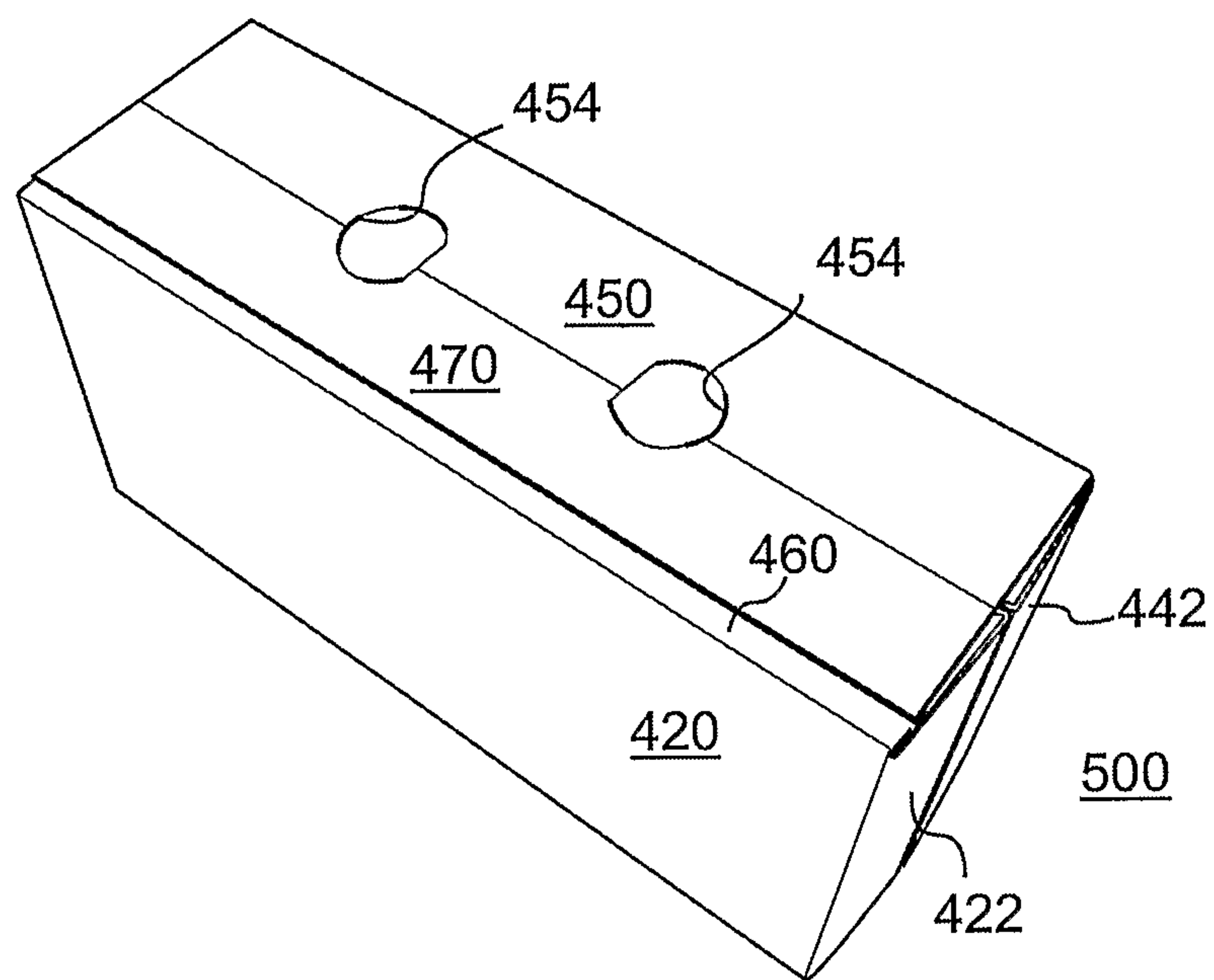
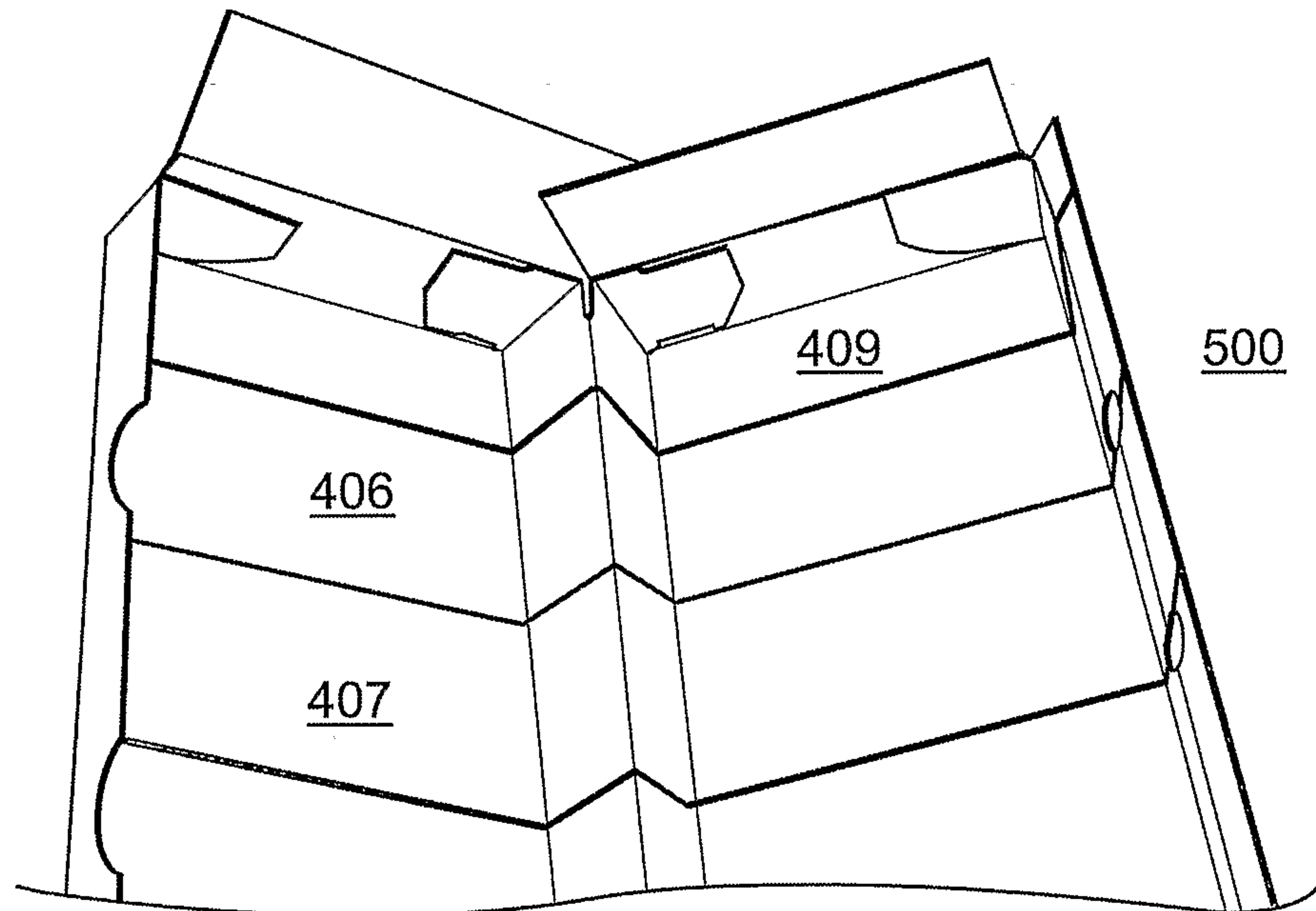
**FIG. 8**

**FIG. 9A**

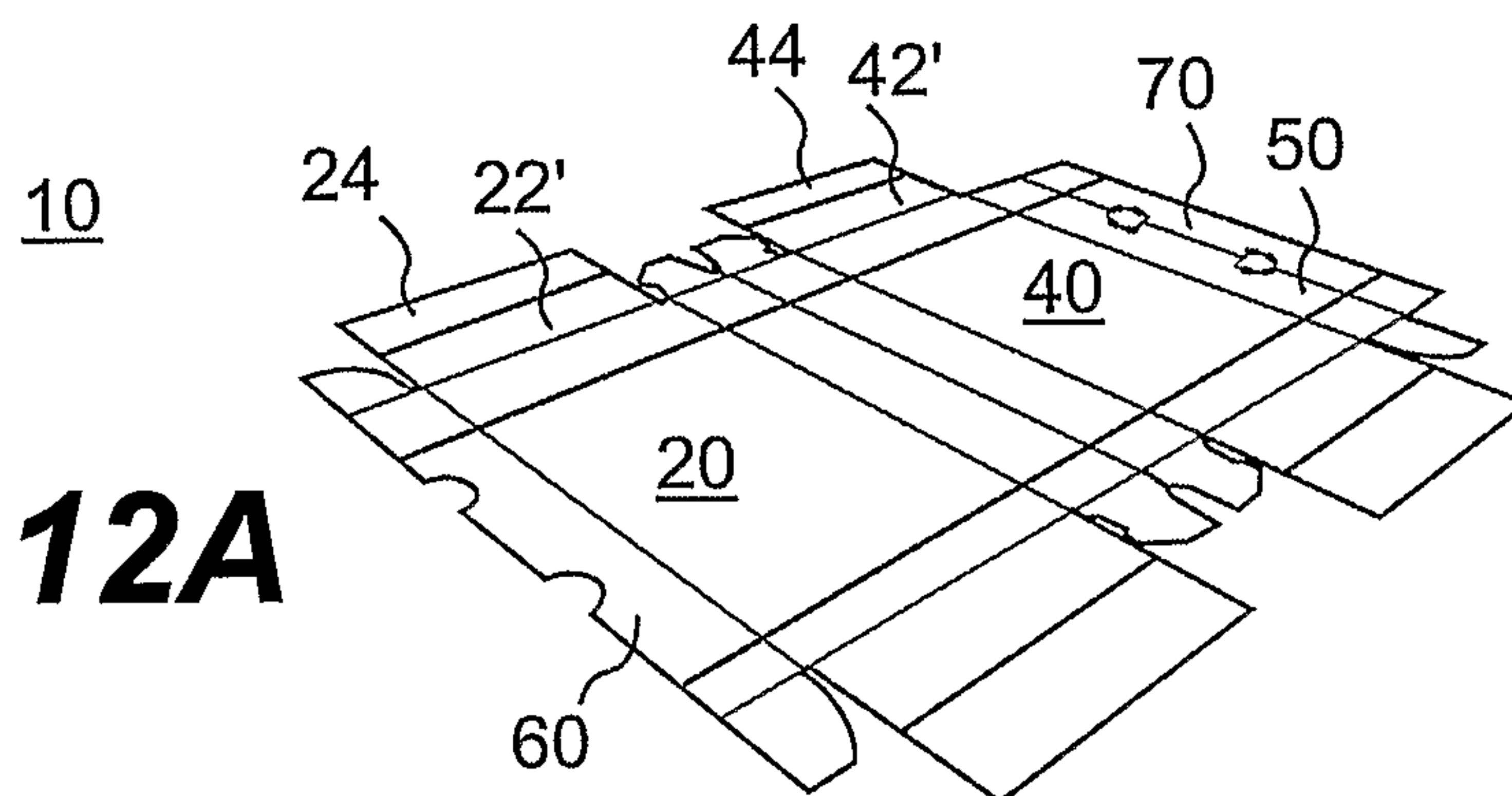
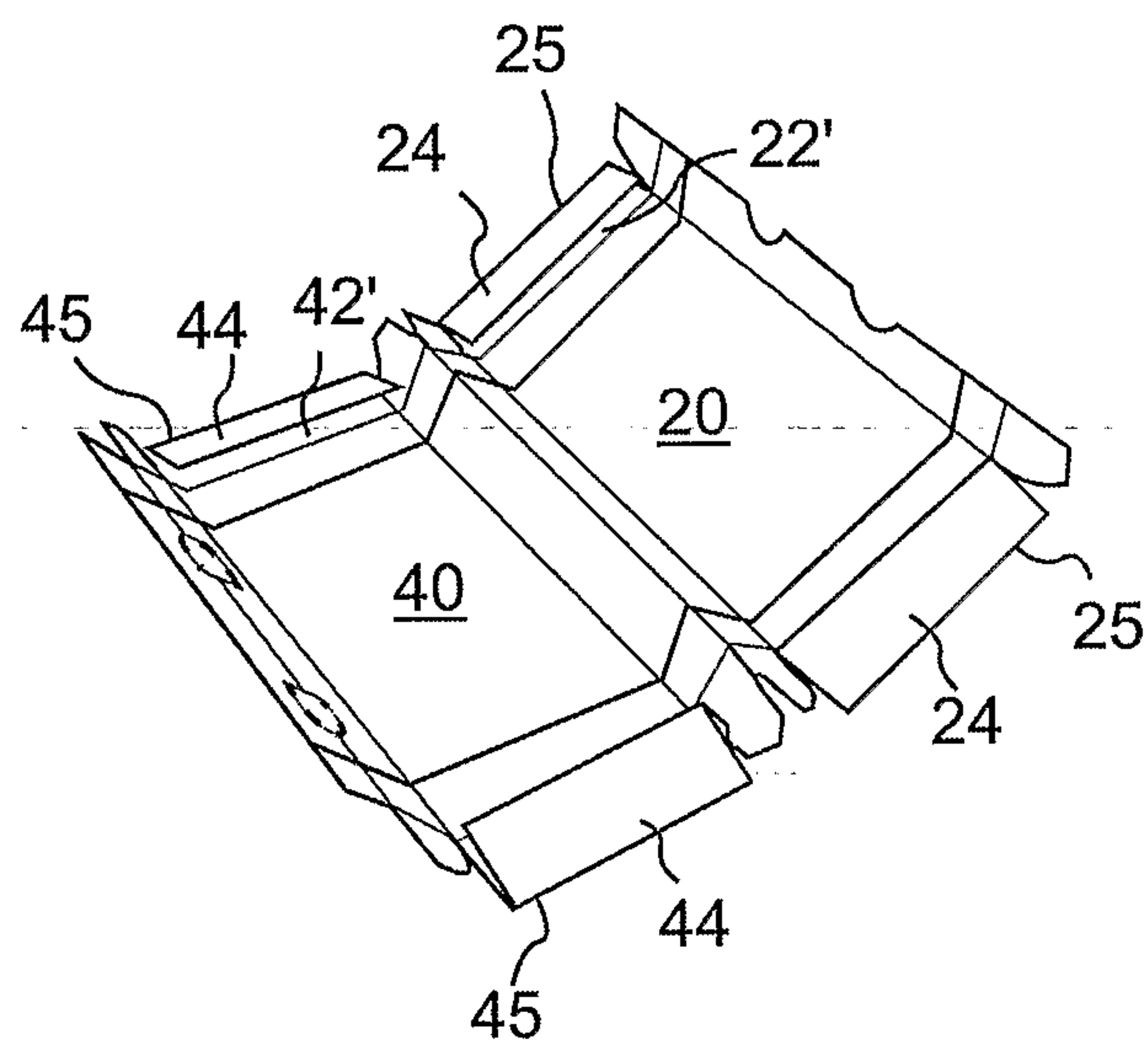
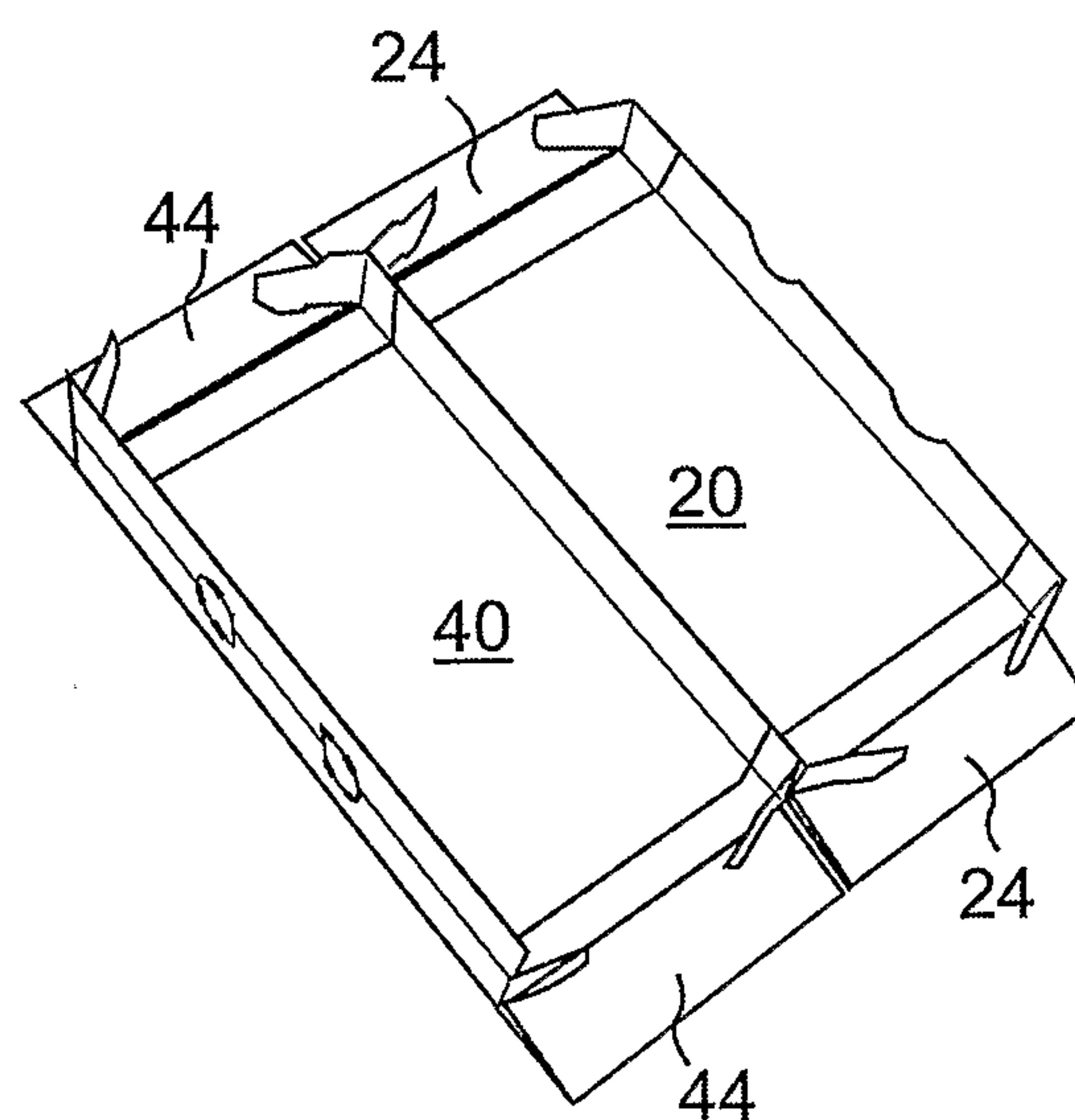
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410**FIG. 9B**

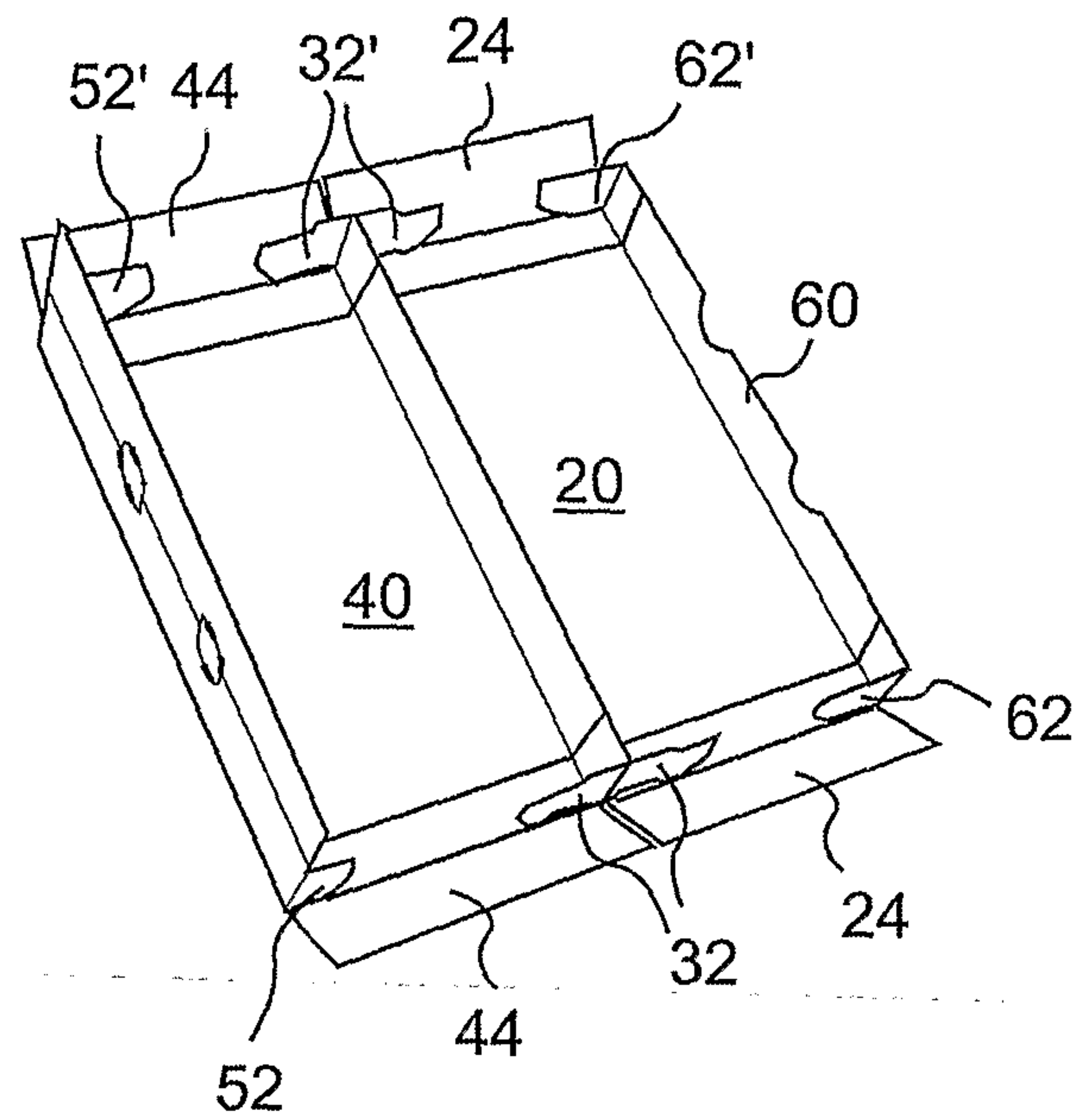
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**FIG. 10****FIG. 11**

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FIG. 12A**FIG. 12B****FIG. 12C**

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FIG. 12D**FIG. 12E**