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(54) **CARTON WITH HANDLE AND DISPENSER**

KARTON MIT GRIFF UND SPENDER

CARTON POURVU D'UNE POIGNÉE ET DISTRIBUTEUR

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Description

BACKGROUND OF THE DISCLOSURE

[0001] The present disclosure is generally related to a carton for holding containers, and more particularly, to a carton having a handle and a dispenser. In particular, the present invention relates to a carton according to the preamble of claim 1, to a carton blank according to the preamble of claim 8, and to a method of opening a carton according to the preamble of claim 13.

[0002] US 5699957 A discloses a carton of the generic type. The dispenser panel, which comprises a handle feature, extends across the top panel of the carton into both side panels. It is confined by the tear line sections extending across the top panel parallel to the handle orientation, said tear line sections being arranged between the handle feature and the top panel end edges along which end flaps are foldedly connected to the top panel. The dispenser is adapted to the remainder of the carton such that the latter falls apart into two compartment units upon removal of the dispenser, each of the two compartment units comprising a dispenser opening for removal of the products contained therein.

SUMMARY OF THE DISCLOSURE

[0003] In one aspect, the disclosure is generally directed to a carton for holding a plurality of containers, according to claim 1. The carton comprises a plurality of panels extending at least partially around an interior of the carton and a dispenser comprising a dispenser panel. The dispenser panel is at least partially defined by a tear line extending in at least one panel of the plurality of panels. The dispenser panel is at least partially removable from the carton to create a dispenser opening. The carton also comprises a handle for grasping and carrying the carton. The handle comprises a handle feature extending in at least the dispenser panel, and at least a portion of the handle is removable from the carton with the dispenser panel.

[0004] In another aspect, the disclosure is generally directed to a blank for forming a carton, according to claim 8. The blank comprises a plurality of panels and dispenser features for forming a dispenser in the carton formed from the blank. The dispenser features comprise a dispenser panel at least partially defined by a tear line extending in at least one panel of the plurality of panels. The dispenser panel is at least partially removable from the carton formed from the blank. The blank also comprises handle features for forming a handle in the carton formed from the blank. The handle features extend in at least the dispenser panel, and at least a portion of the handle features are removable from the carton formed from the blank with the dispenser panel.

[0005] In another aspect, the disclosure is generally directed to a method of opening a carton, according to claim 13. The method comprises obtaining a carton com-

prising a plurality of panels extending at least partially around an interior of the carton, a dispenser comprising a dispenser panel, and a handle for grasping and carrying the carton. The dispenser panel is at least partially defined by a tear line extending in at least one panel of the plurality of panels, and the handle comprises a handle feature extending in at least the dispenser panel. The method further comprises at least partially removing the dispenser panel to form a dispenser opening in the carton, the dispenser opening providing access to the interior of the carton. The at least partially removing the dispenser panel comprises at least partially removing the handle feature in the dispenser panel.

[0006] Those skilled in the art will appreciate the above stated advantages and other advantages and benefits of various additional embodiments reading the following detailed description of the embodiments with reference to the below-listed drawing figures. It is within the scope of the present disclosure that the above-discussed aspects be provided both individually and in various combinations.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] 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 disclosure. Figures 1 to 9 refer to a first and second embodiment of the invention. Other figures refer to embodiments of the disclosure not forming part of the invention.

Fig. 1 is a plan view of a blank used to form a carton according to a first embodiment of the disclosure.

Fig. 1A is a schematic view of a tear line extending in the blank of Fig. 1.

Fig. 2 is a perspective view of the carton assembled from the blank of Fig. 1.

Fig. 3 is a perspective view of the carton of Fig. 2 with a dispenser panel partially removed.

Fig. 4 is a perspective view of the carton with the dispenser panel removed to create a dispenser opening.

Fig. 5 is a perspective view of the opened carton of Fig. 4 with a first opening section and second opening section being pivoted outwardly.

Fig. 6 is perspective view of the carton of Fig. 5 with a further expanded dispenser opening.

Fig. 7 is a plan view of a blank used to form a carton according to a second embodiment of the disclosure.

Figs. 7A and 7B are plan views of the top panels of the blank of Fig. 7.

Fig. 8 is a perspective view of the carton assembled from the blank of Fig. 7.

Fig. 9 is a perspective view of the carton of Fig. 8 with a dispenser panel removed to create a dispenser opening.

Fig. 10 is a plan view of a blank used to form a carton according to a third embodiment of the disclosure.

Figs. 11 and 12 are perspective views of the carton assembled from the blank of Fig. 10.

Figs. 13 and 14 are perspective views of the of the carton of Figs. 11 and 12 with a dispenser panel pivoted upwardly to create a dispenser opening.

Fig. 15 is a plan view of a blank used to form a carton according to a fourth embodiment of the disclosure.

Fig. 16 is a perspective view of the carton assembled from the blank of Fig. 15.

Fig. 17 is a perspective view of the of the carton of Fig. 16 with a dispenser panel partially removed to create a dispenser opening.

Figs. 18 and 19 are perspective views of the carton of Fig. 17 with the dispenser panel removed.

Fig. 20 is a plan view of a blank used to form a carton according to a fifth embodiment of the disclosure.

Fig. 21 is a perspective view of the carton assembled from the blank of Fig. 20.

Fig. 22 is a perspective view of the of the carton of Fig. 21 with a dispenser panel partially removed to create a dispenser opening.

Figs. 23 and 24 are perspective views of the carton of Fig. 22 with the dispenser panel removed.

Fig. 25 is a plan view of a blank used to form a carton according to a sixth embodiment of the disclosure.

Fig. 26 is a perspective view of the carton assembled from the blank of Fig. 25.

Fig. 27 is a perspective view of the carton of Fig. 26 with the dispenser panel removed.

Fig. 28 is a plan view of a blank used to form a carton according to a seventh embodiment of the disclosure.

Figs. 29 and 30 are perspective views of the carton assembled from the blank of Fig. 28.

Fig. 31 is a perspective view of the carton of Figs. 29 and 30 with the dispenser panel removed.

[0008] Corresponding parts are designated by corresponding reference numbers throughout the drawings.

10 DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0009] The present disclosure generally relates to opening, dispensing, and handling features for cartons that contain articles such as containers, bottles, cans, etc. The articles can be used for packaging food and beverage products, for example. The articles can be made from materials suitable in composition for packaging the particular food or beverage item, and the materials include, but are not limited to, metal; glass; aluminum and/or composite materials; plastics such as PET, LDPE, LLDPE, HDPE, PP, PS, PVC, EVOH, and Nylon; and the like, or any combination thereof.

[0010] Cartons according to the present disclosure can accommodate articles of any shape. For the purpose of illustration and not for the purpose of limiting the scope of the disclosure, the following detailed description describes beverage containers (e.g., aluminum, plastic, and/or glass beverage bottles) as disposed within the carton embodiments. In this specification, the terms "inner," "outer," "lower," "bottom," "upper," and "top" indicate orientations determined in relation to fully erected and upright cartons.

[0011] Fig. 1 is a plan view of the exterior side 1 of a blank, generally indicated at 3, used to form a carton 5 (Fig. 2) according to the exemplary embodiment of the disclosure. The carton 5 can be used to house a plurality of articles such as containers C (Figs. 3-6). The carton 5 has a dispenser, generally indicated at 7 (Fig. 2), formed in the carton for allowing access to the containers from the top of the carton, and a handle, generally indicated at 11, formed in the top of the carton for grasping and carrying the carton. As shown in Figs. 5 and 6, an expandable bottom receptacle 13 is formed in the bottom of the carton 5 for accommodating, for example, liquids, ice, or other coolants in the carton bottom. In one exemplary embodiment, ice can be added to the opened carton 5 to cool containers C, and beverages held therein. As the ice melts, all or a part of the resultant runoff water is held within the expandable bottom receptacle 13.

[0012] In the illustrated embodiment, the carton 5 is sized to house twelve containers C in a single layer in a 3x4 arrangement, but it is understood that the carton may be sized and shaped to hold containers of a different or same quantity in more than one layer and/or in different row/column arrangements (e.g., 1x6, 3x6, 2x6, 2x6x2, 3x4x2, 2x9, etc.).

[0013] The blank 3 has a longitudinal axis LI and a

lateral axis L2. As shown in Fig. 1, the blank 3 may have at least partial symmetry about a longitudinal center line C_L and about a lateral center line C_T . Therefore, certain elements in the drawing figures have similar or identical reference numerals in order to reflect the whole or partial longitudinal and transverse symmetries and similar or like elements may be indicated by an "a" or "b" suffix designation for a corresponding reference number. The blank 3 comprises a bottom panel 17 foldably connected to first and second side panels 21, 23 at respective transverse fold lines 25, 27, a first top panel 31 foldably connected to the first side panel 21 at a transverse fold line 33, and a second top panel 35 foldably connected to the second side panel 23 at a transverse fold line 37. The first and second top panels 31, 35 at least partially overlap in the erected carton 5.

[0014] The bottom panel 17 is foldably connected to a first bottom end flap 41a and a second bottom end flap 41b. The first side panel 21 is foldably connected to a first side end flap 43a and a second side end flap 43b. The second side panel 23 is foldably connected to a first side end flap 45a and a second side end flap 45b. The first top panel 31 is foldably connected to a first top end flap 47a and a second top end flap 47b. The second top panel 35 is foldably connected to a first top end flap 49a and a second top end flap 49b.

[0015] The end flaps 41a, 43a, 45a, 47a, 49a extend along a first marginal area of the blank 3, and are foldably connected at a first longitudinal fold line 51a that extends along the length of the blank. The end flaps 41b, 43b, 45b, 47b, 49b extend along a second marginal area of the blank 3, and are foldably connected at a second longitudinal fold line 51b that also extends along the length of the blank. The longitudinal fold lines 51a, 51b may be, for example, substantially straight, or offset at one or more locations to account for blank thickness or for other factors. When the carton 5 is erected, the end flaps 41a, 43a, 45a, 47a, 49a close a first end 55 of the carton, and the end flaps 41b, 43b, 45b, 47b, 49b close a second end 57 of the carton. In accordance with an alternative embodiment of the present disclosure, different flap arrangements can be used for closing the ends 55, 57 of the carton 5.

[0016] Four gussets 61a, 61b are formed in the blank 3, one at each corner of the bottom panel 17.

[0017] Two of the gussets 61a are respectively foldably connected to the respective side end flaps 43a, 43b of the first side panel 21 at oblique fold lines 63a, and to the respective bottom end flaps 41a, 41b at lateral fold lines 65a. Each gusset 61a comprises a first gusset panel 67a foldably connected to a second gusset panel 69a at an oblique fold line 71a. The other two gussets 61b are respectively foldably connected to the side flaps 45a, 45b of the second side panel 23 and the bottom end flaps 41a, 41b in a similar arrangement and manner as the gussets 61a, and the gussets 61b have similar features as the gussets 61a (e.g., fold lines 63b, 65b, 71b, first gusset panels 67b, and second gusset panels 69b).

[0018] The features that comprise the handle 11 include a first handle panel 75 in the first top panel 31 and a second handle panel 76 in the second top panel 35. The features of the first handle panel 75 are indicated by reference numbers having the "a" suffix, and the features of the second handle panel 76 are indicated by reference numbers having a "b" suffix. The handle panels 75, 76 include a narrow gripping portion 77a, 77b centrally located in a respective top panel 31, 35. Each of the top panels 31, 35 includes an aperture 79a, 79b adjacent the respective gripping portions 77a, 77b and at least partially defining a respective first cushion portion 83a, 83b foldably connected to the respective gripping portions 77a, 77b at a respective lateral fold line 85a, 85b. Each of the handle panels 75, 76 has a respective second cushion portion 87a, 87b foldably connected to the respective gripping portions 77a, 77b at a respective lateral fold line 89a, 89b. The first handle panel 75 is at least partially defined by end handle apertures 91 that are formed in the end flaps 47a, 47b at the fold lines 51a, 51b. In one embodiment, the features that form the handle 11 include oblique fold lines 93a, 93b extending from the respective apertures 79a, 79b in the first top panel 31 and the second top panel 35. The handle panels 75, 76 could be otherwise shaped, arranged, and/or configured without departing from the disclosure, and the blank 3 could have other features for forming the handle 11 without departing from the disclosure.

[0019] In the illustrated embodiment, the features that form the dispenser 7 in the carton include a first dispenser panel 101 in the first top panel 31 and the top end flaps 47a, 47b, and a second dispenser panel 103 in the second top panel 35 and the top end flaps 49a, 49b. The first dispenser panel 101 and the second dispenser panel 103 are at least partially overlapped in the carton 5. The first dispenser panel 101 is formed by a tear line 105 comprising an arcuate portion 107 in the top panel 31, an arcuate portion 109 in the top end flap 47a, and an arcuate portion 111 in the top end flap 47b. The arcuate portions 109, 111 can be interrupted by the end handle apertures 91 in the respective top end flaps 47a, 47b. The second dispenser panel 103 is formed by a similarly shaped tear line 115 having respective arcuate portions 117, 119, 121. In the illustrated embodiment, the tear lines 105, 115 cooperate to form a generally oval-shaped dispenser panel 125 (Fig. 2) from the partially overlapped first and second dispenser panels 101, 103. The dispenser panel 125 extends across the top of the carton and into the ends of the carton. The dispenser panel 125 can be separated from the carton along the tear lines 105, 115 to create a dispenser opening 127 (Figs. 3 and 4) for accessing the containers C. Opening of the dispenser panel 125 can be facilitated by scores or fold lines 123, 124 in the portions of the second dispenser panel 103 in the respective top end flaps 49a, 49b. The fold lines 123, 124 can allow the ends of the dispenser panel 125 to be folded inwardly to initiate tearing along the fold lines 105, 115. The first dispenser panel 101, the second dispenser

panel 103, and/or the tear lines 105, 115 can be otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0020] In one embodiment, the blank 3 can include features for reducing unwanted tearing along the tear lines 105, 115 when the handle 11 is in use. For example, as shown in Figs. 1 and 1A, each of the tear lines 105, 115 comprises a series of slits 106 and nicks 108 that are arranged so that none of the slits 106 interrupts the oblique fold lines 93a, 93b. Accordingly, the tear lines 105, 115 include gaps 160 proximate the oblique fold lines 93a, 93b so that when the carton 5 is carried at the handle 11, the force on the handle 11 can be directed along the oblique fold lines 93a, 93b to the corners of the carton 5 through the gaps 160. Most of the weight of the carton 5 is then supported by the stronger portions of the top panels 31, 35 with little or none of the weight being directed across the slits 106 of the tear lines 105, 115 to help avoid initiation of tearing along the tear lines when the handle 11 is in use. However, in the illustrated embodiment, the gaps 160 are not so large that they would stop tearing of the tear lines 105, 115 when removing the dispenser panel 125. When the tearing of the tear lines 105, 115 is initiated at the ends 55, 57 of the carton, the tear lines can continue to tear across the gaps 160 similarly to the tearing of the nicks 108 between the respective slits 106 of the tear lines. The slits 106 of the tear lines 105, 115 can also be spaced apart from the longitudinal fold lines 51a, 51b to help avoid weakening the carton 5 at the edges of the top panels 31, 35.

[0021] As shown in Fig. 1A, the slits 106 of the tear lines 105, 115 can include a main portion 110 that is generally directed along the contour of the respective tear line 105, 115 and an oblique portion 114 that is oblique with respect to the main portion 110. In general, the slits 106 are configured so that the main portion 110 of each slit 106 extends from a preceding nick 108 in the direction of tearing and the oblique portion 114 of the same slit 106 extends from the main portion 110 to a subsequent nick 108 in the direction of tearing. As shown in Fig. 1, the tear line 105 can include a first directional portion 161 extending from the handle aperture 91 in the top end flap 47a to the centerline CL in the top panel 31 and a second directional portion 163 extending from the handle aperture 91 in the top end flap 47b to the centerline CL in the top panel 31. Similarly, the tear line 115 can include a first directional portion 165 extending in the top end flap 49a to the centerline CL in the top panel 35 and a second directional portion 167 extending in the top end flap 49b to the centerline CL in the top panel 35. Each of the directional portions 161, 163, 165, 167 is configured to be torn from the respective end flaps 47a, 47b, 49a, 49b to the centerline CL in the respective top panels 31, 35. Accordingly, the dispenser panel 125 can be removed by tearing the tear lines 105, 115 from each end 55, 57 towards the centerline CL. End directional portions 16, 163 of the tear line 115 overlap the respective first and second directional portions 161, 163 of the tear line 105

when the carton 5 is erected. Similarly, end directional portions 165', 167' of the tear line 105 overlap the respective first and second directional portions 165, 167 of the tear line 115 when the carton 5 is erected. Accordingly, the end directional portions 161', 163', 165', 167' are configured to be torn along with and in the direction of the respective directional portions 161, 163, 165, 167. The directional nature of the directional portions of the tear lines helps to encourage tearing from the ends 55, 57 of the carton 5, such as when removing the dispenser panel 125, and helps to inhibit tearing from the center of the top panels 31, 35, such as due to stress on the top panels 31, 35 from supporting the weight of the carton 5 at the handle 11. The tear lines 105, 115 can be otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0022] In the illustrated embodiment, the blank 3 includes a first opening section 133a foldably connected to the first side panel 21 at a lateral fold line 135 extending across the first side panel, and a second opening section 133b foldably connected to the second side panel 23 at a lateral fold line 139 extending across the second side panel. The first opening section 133a is at least partially defined by the arcuate portion 107 of the tear line 105 in the first top panel 31, a lateral tear line 143a in the top end flap 47a, an oblique tear line 145a in the top end flap 47a, a lateral tear line 147a in the top end flap 47b, and an oblique tear line 149a in the top end flap 47b. The lateral tear line 143a and the oblique tear line 145a can at least partially define an end portion 150a of the opening section 133a in the top end flap 47a, and the lateral fold line 147a and the oblique tear line 149a can at least partially define an end portion 152a of the opening section 133a in the top end flap 47b. Also, the first opening section 133a is defined by an oblique tear line 153a extending from the longitudinal fold line 51a to a notch 155a in the side end flap 43a and an oblique tear line 17a extending from the longitudinal fold line 51b to a notch 159a in the side end flap 43b. The tear lines 153a, 157a can extend from respective ends of the lateral fold line 135 in one embodiment. The tear lines 153a, 157a and the notches 155a, 159a can define respective upper portions 154a, 158a of the respective side end flaps 43a, 43b. The upper portions 154a, 158a of the side end flaps 43a, 43b can be glued to the respective end portions 150a, 152a of the opening section 133a to form the ends of the opening section 133a in the carton 5. Additionally, the oblique tear lines 145a, 149a can at least partially overlap the respective tear lines 153a, 157a when the ends of the opening section 133a are formed. The first opening section 133a could be otherwise shaped, arranged, configured, and/or omitted without departing from the disclosure.

[0023] In one embodiment, the second opening section 133b is similarly shaped as the opening section 133a and has similar or identical features designated by a "b" suffix on the reference numbers. The opening section 133b is at least partially defined by tear lines 117, 143b,

145b, 147b, 149b, 153b, 157b, notches 155b, 159b, and the fold line 139. Upper portions 154b, 158b of the respective side end flaps 45a, 45b can be glued to respective end portions 10b, 152b of the opening section 133b to form the ends of the opening section 133b in the carton 5. The second opening section 133b could be otherwise shaped, arranged, configured and/or omitted without departing from the disclosure.

[0024] An exemplary method of erecting the carton 5 is discussed below. Glue or other adhesive is applied to the upper or exterior side of the first top panel 31 and all or a portion of the top end flaps 47a, 47b, 49a, 49b may also have glue applied thereto. Portions of the side end flaps 43a, 43b that will overlap one or more of the gusset panels 67a, 67b may also have glue applied thereto. The first and second top panels 31, 35 are overlapped and secured together with the gripping portions 77a, 77b of the respective first and second handle panels 75, 76 overlapped to form the handle 11. The side panels 21, 23 are folded relative to the bottom panel 17 and the overlapped top panels 31, 35 to form a generally open-ended sleeve. Containers C can be loaded into the open-ended sleeve. Alternatively, one end of the sleeve can be closed prior to loading the containers C.

[0025] After loading the containers C, the end flaps 41a, 43a, 45a, 47a, 49a can be overlapped and secured to close the first end 55 of the carton 5 (Fig. 2), and the end flaps 41b, 43b, 45b, 47b, 49b can be overlapped and secured to close the second end 57 of the carton (Fig. 2). During the closing of the ends 55, 57 the gusset panels 67a, 67b and the gusset panels 69a, 69b can be folded to be in face-to-face contact with the respective side end flaps 43a, 43b, 45a, 45b, with the gusset panels 67a, 67b being adhesively secured to the respective side end flaps 43a, 43b, 45a, 45b. In this manner the expandable bottom receptacle 13 can be formed. A portion of each of the bottom end flaps 41a, 41b can be adhered to a portion of the respective top end flaps 47a, 49a and 47b, 49b. Additionally, during the closing of the ends 55, 57, the upper portions 154a, 158a, 154b, 158b of the respective side end flaps 43a, 43b, 45a, 45b can be glued to the respective end portions 150a, 152a, 150b, 152b to form the respective ends of the opening sections 133a, 133b. The carton 5 can be alternatively erected without departing from the disclosure.

[0026] In the illustrated embodiment, the handle 11 is a two-ply handle formed by the overlapped first and second handle panels 75, 76, but the carton 5 could have other handle arrangements that are other than two-ply (e.g., single-ply, three-ply, etc.) without departing from the disclosure. The carton 5 may be, for example, parallelepipedal or generally parallelepipedal in shape, or may be other shapes without departing from the disclosure.

[0027] As shown in Figs. 3 and 4, the dispenser 7 is activated to an initially opened condition (Fig. 4) by breaching the carton along the tear lines 105, 115 to separate the dispenser panel 125 from the carton and create the dispenser opening 127 for accessing the con-

tainers C. As shown in Figs. 5 and 6, the dispenser opening 127 can be expanded by separating the first opening section 133a and second opening section 133b from the ends 55, 57 of the carton 5 and pivoting the opening sections about respective fold lines 135, 139. The first opening section 133a is separated from the ends 55, 57 by tearing along tear lines 143a, 145a, 147a, 149a, 153a, 157a and the second opening section is separated from the ends 55, 57 by tearing along tear lines 143b, 145b, 147b, 149b, 153b, 157b. As shown in Fig. 5 each opening section 133a, 133b can be pivoted outwardly in the direction of arrows A1, A2 to expand the dispenser opening 127. The expanded dispenser opening 127 (Fig. 6) of the carton 5 allows the carton to accommodate ice or other coolant.

[0028] According to the above embodiment, ice, cold water, additional containers, or other items, for example, can be placed in the carton 5 through the expanded dispenser opening 127. The gussets 61a, 61b, the bottom end panels 41a, 41b, the side end flaps 43a, 43b, 45a, 45b, and lower portions of the side panels 21, 23 at least partially close the bottom portion of the carton 5 and create the at least partially closed expandable bottom receptacle 13 in the bottom of the carton. Prior to separating the opening sections 133a, 133b from the ends 55, 57 of the carton 5 (Figs. 2-4), the top end flaps 47a, 47b, 49a, 49b are retained against the respective side end flaps 43a, 43b, 45a, 45b since the upper portions 154a, 158a, 154b, 158b are glued to the end portions 150a, 152a, 150b, 152b. Since the bottom end flaps 41a, 41b are glued to the top end flaps 47a, 47b, 49a, 49b, the bottom end flaps 41a, 41b are retained against the gussets 61a, 61b and the side end flaps 43a, 43b, 45a, 45b. Once the opening sections 133a, 133b are separated from the ends 55, 57 of the carton 5 (Figs. 5 and 6), the remainders of the top end flaps 47a, 47b, 49a, 49b and the bottom end flaps 41a, 41b are free to pivot away from the side end flaps 43a, 43b, 45a, 45b. Accordingly, the gusset panels 69a, 69b can fold with respect to the side end flaps 43a, 43b, 45a, 45b and the bottom end flaps 41a, 41b. Accordingly, the side panels 21, 23 can pivot somewhat about the respective transverse fold lines 25, 27, and the bottom end flaps 41a, 41b can pivot somewhat about the respective longitudinal fold lines 51a, 51b. Accordingly, the gussets 61a, 61b allow further opening of the dispenser opening 127. Additionally, the expandable bottom receptacle 13 of the opened carton 5 can be used to retain liquids, such as water formed from melting ice, condensation, other liquids, and articles such as, for example, refuse or fine particulate matter such as powders.

[0029] The expandable bottom receptacle 13 may have a height H_R below which the carton 5 is liquid-tight. The height H_R represents a portion of the bottom of the carton 5 below which no glued seals or seams are formed through which water or other liquid might leak. In one embodiment, the height H_R is approximately equal to the length of the fold line 71a, 71b connecting the gusset

panel 67a, 67b with the gusset panel 69a, 69b. That is, in accordance with the illustrated embodiment, no adhesive seal or other joiner of material where fluid might escape the carton 5 is located in the carton below the height H_R . The expandable bottom receptacle 13 may therefore be formed from a continuous section of folded material of the blank 3. The height H_R of the liquid-tight portion of the receptacle 13 below which there are no glued seams may generally be between approximately 0 inches to approximately 4 inches (approximately 0 mm to approximately 102 mm), and, more preferably, may be approximately $2\frac{3}{4}$ inches (approximately 70 mm). It is understood that all dimensional information presented herein is intended to be illustrative and is not intended to be used to limit the scope of the disclosure.

[0030] In alternative embodiments, a dispenser with at least a portion of a handle can be used with substantially any package, such as the carton 5 of the first embodiment, a wrap-around carrier, or any other style of carton so that a handle is removed from the carton when the dispenser is activated. Alternatively, the handle can be removed similarly to a dispenser panel without forming a dispenser opening. In one example, the handle can be removed to inhibit carrying of the carton after significant weight has been added to the carton or the carton has been potentially weakened (such as by adding ice or water).

[0031] Fig. 7 illustrates an exterior side 201 of a blank 203 for forming a carton 205 according to a second embodiment of the disclosure. The second embodiment is generally similar to the first embodiment, except for variations noted and variations that will be apparent to one of ordinary skill in the art. Accordingly, similar or identical features of the embodiments have been given like or similar reference numbers. The blank 203 has a longitudinal axis L1 and a lateral axis L2. The carton 205 is illustrated in its erected state in Figs. 8 and 9.

[0032] Referring to Fig. 7, the blank 203 can include a gusset 261a, 261b at the four corners of the bottom panel 217 for forming a generally liquid-tight bottom receptacle in the carton 205. Each of the gussets 261a includes a first gusset panel 267a foldably connected to a second gusset panel 269a along an oblique fold line 271a. A kiss-cut or partial cut can be formed in each of the fold lines 271a to aid in assembling the carton 5, such as by helping to make the folding of the gusset panels 267a, 269a along the fold lines 271a easier. The first gusset panels 267a are foldably connected to the first side panel 221 along respective longitudinal fold lines 251a, 251b, and the second gusset panels 269a are foldably connected to respective bottom end flaps 241a, 241b along lateral fold lines 265a. The side end flaps 243a, 243b are separable from the first gusset panels 267a along respective cut lines 353a, 357a. Alternatively, the cut lines 353a, 357a could be tear lines, fold lines, scores, etc. The gussets 261b are respectively foldably connected to the second side panel 223 and the bottom end flaps 241a, 241b in a similar arrangement and manner as the gussets 261a,

and the gussets 261b have similar features as the gussets 261a (e.g., fold lines 265b, 271b, first gusset panels 267b, and second gusset panels 269b). When the carton 5 is formed, the gussets 261a, 261b can be folded against and adhered to the bottom end flaps 241a, 241b, the side panels 221, 223, or a combination of both to form the bottom receptacle. The gussets 261a, 261b can be omitted or otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0033] The dispenser 207 and the handle 211 are similar to the dispenser 7 and the handle 11 of the first embodiment, except the dispenser 207 omits the opening sections and includes an alternative opening section at each end 255, 257 of the carton 205. As shown in Fig. 7A, the first dispenser panel 301 in the first top panel 231 is at least partially defined by a tear line 305 extending from access openings 370 in the first top end flap 247a to access openings 372 in the second top end flap 247b. The tear line 305 includes a first directional portion 361 extending from the openings 370 to the centerline CL of the first top panel 231 and a second directional portion 363 extending from the openings 372 to the centerline CL of the first top panel 231. The first and second directional portions 361, 363 are configured to be torn from the respective access openings 370, 372 towards the centerline CL of the first top panel 231. The tear line 305 also includes gaps 360 between the slits forming the tear line proximate the oblique fold lines 293a. The slits of the fold line 305 can also be spaced apart at the longitudinal fold lines 251a, 251b. The first dispenser panel 301 can also include two openings 291 interrupting each of the longitudinal fold lines 251a, 251b to help fold the overlapped end flaps 247a, 249a and 247b, 249b over the ends 255, 257 of the carton 205.

[0034] As shown in Fig. 7B, the second dispenser panel 303 can be at least partially defined by a tear line 315 extending from access flaps 374 in the first top end flap 249a to access flaps 376 in the second top end flap 249b. The tear line 315 includes a first directional portion 365 extending from the access flaps 374 to the centerline CL of the second top panel 235 and a second directional portion 367 extending from the access flaps 376 to the centerline CL of the second top panel 235. The first and second directional portions 365, 367 are configured to be torn from the respective access flaps 374, 376 towards the centerline CL of the second top panel 235. The tear line 315 also includes gaps 360 between the slits forming the tear line proximate the oblique fold lines 293b. The slits of the fold line 315 can also be spaced apart at the longitudinal fold lines 251a, 251b. The access flaps 374, 376 can be defined by cut lines or tear lines 373 in the respective top end flaps 249a, 249b, and can be foldably connected to the dispenser panel 303 along fold lines 375. A cut or tear line 377 can extend between the access flaps 374 and the between the access flaps 376. The first dispenser panel 301, the second dispenser panel 303, the access openings 370, 372, the access flaps 374, 376, and/or the tear lines 305, 315 can be otherwise shaped,

arranged, and/or configured without departing from the disclosure.

[0035] As shown in Fig. 8, the erected carton 205 includes the overlapped top panels 231, 235 with the second dispenser panel 303 overlapping the first dispenser panel 301 to form the dispenser panel 325. Additionally, the handle grip portion 277b overlaps the handle grip portion 277a in the dispenser panel 325. The access flaps 374, 376 can overlap the respective access openings 370, 372 at the respective closed ends 255, 257 of the carton 205 to form access features 378 at each end.

[0036] The dispenser 207 can be opened by initiating tearing at the access features 378 at each end 255, 257. The access feature 378 at the first end 255 of the carton is activated by pushing the access flaps 374 in to the interior of the carton 205, folding along fold lines 375. The access openings 370 provide clearance for the pivoting access flaps 374. In one embodiment, a user uses two fingers to activate the access feature 378 at the first end 255 - one finger for each access flap 374. The access feature 378 at the second end 357 of the carton can be similarly activated by folding the access flaps 376 along fold lines 375 past the access openings 372. The dispenser panel 325 can be removed by tearing from one end to approximately the centerline of the top panels 231, 235 and then tearing from the opposite end. Alternatively, the dispenser panels 325 can be removed by tearing from both ends 255, 257 generally simultaneously.

[0037] The opened carton 205 with a dispenser opening 327 and the removed dispenser panel 325 are shown in Fig. 9. The dispenser 207 can be alternatively opened without departing from the disclosure. For example, the dispenser 207 could be opened by initiating tearing at one of the access features 378 at one end 255, 257 and tearing the tear lines 305, 315 from that end to the opposite end.

[0038] In one exemplary embodiment, the cartons 5, 205 of the first and second embodiments can be made with 24-point paperboard, which is generally strong enough to support the carton with 12 full containers C at the handles 11, 211 without significant unwanted tearing at the tear lines 105, 115 or 305, 315. Alternatively, other paperboards can be used. For example, the paperboard used can depend on the number, size, contents, and/or the total weight of the containers C contained in the carton 5, 205.

[0039] Fig. 10 illustrates an interior side 401 of a blank 403 for forming a carton 405 according to a third embodiment of the disclosure. The third embodiment is generally similar to the second embodiment, except for variations noted and variations that will be apparent to one of ordinary skill in the art. Accordingly, similar or identical features of the embodiments have been given like or similar reference numbers. The blank 403 has a longitudinal axis L1 and a lateral axis L2. The carton 405 is illustrated in its erected state in Figs. 11-14.

[0040] As shown in Figs. 10-12, the dispenser 407 and the handle 411 are similar to the dispenser 207 and the

handle 211 of the second embodiment. However, the first dispenser panel 501 extends in the second top end flap 447b and the first top panel 431 to the first longitudinal fold line 451a, and the second dispenser panel 503 extends in the second top end flap 449b and the second top panel 435 to the first longitudinal fold line 251a. The first dispenser panel 501 comprises a tear line 505 extending from the access openings 372 across the second top end flap 447b and the first top panel 431 and terminates adjacent the first longitudinal fold line 251a. The second dispenser panel 503 comprises a tear line 515 that extends from the access flaps 376 across the second top end flap 449b and the second top panel 435 and terminates adjacent the first longitudinal fold line 251a. The slits of the tear lines 505, 515 are oriented for tearing from the access openings 372 and access flaps 376 toward the longitudinal fold line 251a all the way across the respective top panels 431, 435. The tear lines 505, 15 can include gaps 560 where the slits of the fold lines 505, 515 are spaced apart from the respective oblique fold lines 293a, 293b. The slits of the fold lines 505, 515 can also be spaced apart at the longitudinal fold lines 251a, 251b.

[0041] As shown in Figs. 11 and 12, the erected carton 405 includes a dispenser panel 525 formed from the overlapped dispenser panels 501, 503 in the overlapped top panels 431, 435 and the overlapped top end flaps 447b, 449b in the closed end 457 of the carton 405. The handle 411 is positioned within the dispenser panel 525. The access flaps 376 in the second top end flap 449b overlap the access openings 372 in the second top end flap 447b to form an access feature 378 in the closed end 457 of the carton 405.

[0042] As shown in Figs. 13 and 14, the dispenser 407 can be activated by pushing the access flaps 376 towards the interior of the carton 405 through the access openings 372 and pulling the dispenser panel 525 outwardly to tear the tear lines 505, 515 from the access feature 378 across the second longitudinal fold line 251b and across the top panels 431, 435 to the first longitudinal fold line 251a. While tearing along the tear lines 505, 515, the dispenser panel 525 is pivoted upwardly along the first longitudinal fold line 251a. Accordingly, a dispenser opening 527 is formed in the carton 405 and the dispenser panel 525 remains attached to the carton 405. Additionally, the handle 411 is substantially removed from the top of the carton 405 when the dispenser 407 is activated. The dispenser panel 525 optionally can be folded and tucked into the dispenser opening 527 at the closed end 455 of the carton 405 as shown in Fig. 14.

[0043] The dispenser 407 can be otherwise shaped, arranged, and/or configured without departing from the disclosure. For example, the dispenser panel 525 could be foldably connected to the top panels 431, 435 of the carton along fold lines that extend in the respective top panels 431, 435 and that are spaced apart from the first longitudinal fold line 251a. Alternatively, the dispenser panel 525 can be foldably connected to the closed end

455 by fold lines that extend in the respective first top end flaps 447a, 449a and that are spaced apart from the first longitudinal fold line 25 la.

[0044] Fig. 15 illustrates an interior side 601 of a blank 603 for forming a carton 605 according to a fourth embodiment of the disclosure. The fourth embodiment is generally similar to the previous embodiments, except for variations noted and variations that will be apparent to one of ordinary skill in the art. Accordingly, similar or identical features of the embodiments have been given like or similar reference numbers. The blank 603 has a longitudinal axis L1 and a lateral axis L2. The carton 605 is illustrated in its erected state in Figs. 16-19. The carton 605 includes a dispenser 607 with a single-ply dispenser panel 701. A handle 611 extends in the dispenser panel 701.

[0045] In the illustrated embodiment, the carton 605 is sized to house ten containers C in a single layer in a 2x5 arrangement, but it is understood that the carton may be sized and shaped to hold containers of a different or same quantity in more than one layer and/or in different row/column arrangements (e.g., 1x6, 3x6, 3x4, 2x6, 2x6x2, 3x4x2, 2x9, etc.). In the illustrated embodiment, the containers C can be 222-ml (7.5-oz) cans (e.g., aluminum cans); however, the containers C alternatively can be any style of container.

[0046] As shown in Fig. 15, the blank 603 includes a bottom panel 617, a first side panel 621 foldably connected to the bottom panel 617 along a lateral fold line 625, a top panel 631 foldably connected to the first side panel 621 along a lateral fold line 633, and a second side panel 623 foldably connected to the top panel 631 along a lateral fold line 637. An attachment flap 632 can be foldably connected to the bottom panel 617 along a lateral fold line 634. The attachment flap 632 can be adhered to the interior surface of the second side panel 623 when erecting the carton 605. Alternatively, the attachment flap can be foldably connected to the second side panel 623 for being adhered to the bottom panel 617 when the carton is erected. The bottom panel 617 is foldably connected to a first bottom end flap 641a and a second bottom end flap 641b. The first side panel 621 is foldably connected to a first side end flap 643a and a second side end flap 643b. The second side panel 623 is foldably connected to a first side end flap 645a and a second side end flap 645b. The top panel 631 is foldably connected to a first top end flap 647a and a second top end flap 647b.

[0047] The end flaps 641a, 643a, 645a, 647a extend along a first marginal area of the blank 603, and are foldably connected at a first longitudinal fold line 651a that extends along the length of the blank. The end flaps 641b, 643b, 645b, 647b extend along a second marginal area of the blank 603, and are foldably connected at a second longitudinal fold line 651b that also extends along the length of the blank. When the carton 605 is erected, the end flaps 641a, 643a, 645a, 647a close a first end 655 of the carton, and the end flaps 641 b, 643b, 645b, 647b close a second end 657 of the carton. In accordance with

an alternative embodiment of the present disclosure, different flap arrangements can be used for closing the ends 655, 657 of the carton 605.

[0048] In the illustrated embodiment, the features that form the dispenser 607 in the carton 605 include the dispenser panel 701 in the top panel 631 and the side panels 621, 623. The dispenser panel 701 is formed by a tear line 705 comprising longitudinal portions 707, 709 extending in the top panel 631 and into the side panels 621, 632, and side portions 711, 713 extending from respective ends of the longitudinal portions 707, 709 in the first side panel 621 and the second side panel 623. In one embodiment, at least the side portions 711, 713 of the tear line 705 are directional portions, which can be similar to the directional portions 161, 163, 165, 167. Accordingly, the side portions 711, 713 can be configured to tear more easily from the access features 778 upwardly than from the top panel 631 into the side panels 621, 623. This configuration can help avoid unwanted tearing of the carton 605 at the tear line 705 while carrying the carton at the handle 611. In the illustrated embodiment, the dispenser 607 further includes respective access features 778 in the first side panel 621 and the second side panel 623. Each of the access features can include access flaps 776 at least partially defined by cuts 773. Alternatively, the cuts 773 could be tear lines. A tear line 777 can extend between the access flaps 776. The access features 778 can be defined by respective curved scores 775 extending in the dispenser panel 701 from the respective side portions 711 to the respective side portions 713. In one embodiment, a generally V-shaped fold line 779 can extend in each of the access flaps 776 to help the access flaps deform (e.g., around the containers C) as the access flaps are folded into the interior of the carton 605 when activating the access features 778. The dispenser panel 701, the tear line 705, and/or the access features 778 can be omitted or otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0049] The features that comprise the handle 611 include handle flaps 675 in the top panel 631, within the dispenser panel 701. The handle flaps 675 are foldably connected to the top panel 631 along respective longitudinal fold lines 676. The handle flaps 675 could be otherwise shaped, arranged, and/or configured without departing from the disclosure, and the blank 603 could have other features for forming the handle 611 without departing from the disclosure. For example, the handle flaps could be omitted, and the handle could include handle apertures in the top panel. Alternatively, or in addition, any suitable handle style can be used with the carton 605.

[0050] The erected carton 605 is shown in Fig. 16 with the handle flaps 675 inwardly folded for carrying the carton. As shown in Fig. 17, the dispenser 607 can be activated by initiating tearing at the access features 778 and folding the dispenser panel 701 upwardly. A user can push the access flaps 776 into the interior of the carton, folding the access feature inwardly along the curved

score 775. The dispenser panel 701 can then be grasped at the opening formed at the access feature 778 and be pulled outwardly and upwardly to tear the tear line 705 along the side portions 711, 713 and the longitudinal portions 707, 709. The tearing can be initiated at one access feature 778 or at both access features 778 simultaneously. For example, the tearing can be initiated at the access feature 778 in the first side panel 621, and the dispenser panel 701 can be pivoted upwardly, as shown in Fig. 17, to form a dispenser opening 727. In one embodiment, the configuration of the access features 778 (e.g., having two access flaps 776 for each access feature) can help a user open the carton at least because the user can grasp the dispenser panel 701 with multiple fingers at the access features 778. Accordingly, the tear line 705 can be configured to be harder to tear (e.g., thicker panel material and/or larger spacing between cuts) than other tear lines used with less convenient access features. This can further help avoid unwanted tearing of the carton at the tear line 705 when carrying the carton at the handle 611. The dispenser panel 701 can be fully removed, in one embodiment, by continuing to tear along the tear line 705, and/or actuating the access feature 778 in the second side panel 623 and tearing along the side portions 711, 713 of the tear line in the second side panel. The carton 605 can be opened by alternative steps without departing from the disclosure.

[0051] As shown in Figs. 18 and 19, the dispenser panel 701 is fully removed with the handle 611. The dispenser panel 701 can be tucked into the opened carton 605 for display. As shown in Fig. 19, for example, the dispenser panel 701 can be inserted into the dispenser opening 727 between a row of containers C and one of the first side panel 621 and the second side panel 623. The carton 605, the dispenser 607, and/or the handle 611 could be otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0052] Fig. 20 illustrates an interior side 801 of a blank 803 for forming a carton or wrap 805 according to a fifth embodiment of the disclosure. The fifth embodiment is generally similar to the fourth embodiment, except for variations noted and variations that will be apparent to one of ordinary skill in the art. Accordingly, similar or identical features of the embodiments have been given like or similar reference numbers. The blank 803 has a longitudinal axis L1 and a lateral axis L2. The wrap 805 is illustrated in its erected state in Figs. 21 -24, wherein the blank 803 is formed into the wrap 805 around containers C to form a package 806. The wrap 805 includes a dispenser 807 with a single-ply dispenser panel 901. A handle 811 extends in the dispenser panel 901.

[0053] In the illustrated embodiment, the carton 805 is sized to house eight containers C in a single layer in a 2x4 arrangement, but it is understood that the carton may be sized and shaped to hold containers of a different or same quantity in more than one layer and/or in different row/column arrangements (e.g., 1x6, 3x6, 3x4, 2x6, 2x6x2, 3x4x2, 2x9, etc.). In the illustrated embodiment,

the containers C can be 355-ml (12-oz) plastic bottles; however, the containers C alternatively can be any style of container.

[0054] As shown in Fig. 20, the blank 803 includes a first bottom panel 817, a first side panel 821 foldably connected to the first bottom panel 817 along a lateral fold line 825, a top panel 831 foldably connected to the first side panel 821 along a lateral fold line 833, a second side panel 823 foldably connected to the top panel 831 along a lateral fold line 837, and a second bottom panel 840 foldably connected to the second side panel 823 along a lateral fold line 842. Top end flaps 847 can be foldably connected to opposite ends of the top panel 831 along respective longitudinal fold lines 851. Additionally, a gusset 844 can be disposed adjacent each of the four corners of the top panel 831. Each gusset 844 can comprise a first gusset panel 846a foldably connected to an end of one of the end flaps 847 and a second gusset panel 846b foldably connected to one of the first and second side panels 821, 823. The first gusset panels 846a can be foldably connected to the respective second gusset panels 846b along oblique fold lines. The end flaps 847 and/or the gussets 844 can be omitted or otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0055] As shown in Fig. 20, the second bottom panel 840 includes three primary male locking features 890 for interlocking with respective primary female locking apertures 892 in the first bottom panel 817 when the carton 805 is erected. The second bottom panel 840 further includes four secondary male locking features 894 for interlocking with respective secondary female locking features 895 in the first dispenser panel 817. In the illustrated embodiment, four retaining features 896 can extend in the first bottom panel 817 and the first side panel 821, interrupting the lateral fold line 825. Similarly, four retaining features 896 can extend in the second bottom panel 840 and the second side panel 823, interrupting the lateral fold line 842. The retaining features can include panels or flaps that engage the bottoms of the respective containers C in the package 806 and that form openings in the wrap 805 for at least partially receiving the bottoms of the containers C (Fig. 21). The bottom panels 817, 840, the primary male locking features 890, the primary female locking features 892, the secondary male locking features 894, the secondary female locking features 895, and/or the retaining features 896 can be omitted or otherwise shaped, arranged, and/or configured without departing from the disclosure. For example, any suitable number of locking features can be included and/or the bottom panels 817, 840 could be glued together to form the wrap 805.

[0056] In the illustrated embodiment, the features that form the dispenser 807 in the wrap 805 include the dispenser panel 901 in the top panel 831 and the side panels 821, 823. The dispenser panel 901 is formed by a tear line 905 extending in the top panel 831 and into the side panels 821, 832. The dispenser 807 further includes re-

spective access features 978 in the first side panel 821 and the second side panel 823. Each of the access features 978 can include at least one access flap 976 at least partially defined by a cut 973. Alternatively, the cuts 973 could be tear lines. The access flaps 976 can be further defined by respective fold lines 975 extending in the dispenser panel 901. The dispenser panel 901, the tear line 905, and/or the access features 978 can be omitted or otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0057] As shown in Fig. 20, the tear line 905 can include top portions 907 (e.g., cut lines) extending in the top panel 831 and directional portions 911, 913 extending from the top portions 907 in the top panel 831 and into the respective side panels 821, 823. In one embodiment, the directional portions 911, 913 can extend adjacent the respective access features 978 in the respective side panels 821, 823. As described with respect to the previous embodiments above, the directional portions 911, 913 of the tear line 905 can be configured to tear more easily from the access features 978 toward the top portions 907 in the top panel 831. Accordingly, the configuration of the tear line 905 can help avoid unwanted tearing of the wrap 805 when carrying the package 806 at the handle 811 (e.g., the directional portions 911, 913 of the tear line are less likely to tear from the top panel 831 when supporting the package at the handle).

[0058] The features that comprise the handle 811 include handle flaps 875 in the top panel 831, within the dispenser panel 901. The handle flaps 875 are foldably connected to the top panel 831 along respective fold lines 876 adjacent a handle aperture 879. The handle 811 can include longitudinal cuts or tear lines 880 that are generally aligned with the centerline of the handle 811 and that extend from the handle aperture 879 in the top panel 831 and into the side panels 821, 823. The tear lines 880 can tear to expand the handle opening when a user grasps the handle 811. Scores 882 in the side panels 821, 823 can act as tear stops to prevent excessive tearing of the wrap 805 at the tear lines 880 and can help redirect forces on the wrap from supporting the weight of the package 806 at the handle 811. The handle 811 could be otherwise shaped, arranged, and/or configured without departing from the disclosure, and the blank 803 could have other features for forming the handle 811 without departing from the disclosure. For example, the handle flaps could be omitted.

[0059] The assembled package 806 is shown in Fig. 21 with the handle flaps 875 inwardly folded for carrying the package. As shown in Fig. 22, the dispenser 807 can be activated by initiating tearing at the access features 978. A user can push the access flaps 976 into the interior of the wrap 805, folding the access feature inwardly along the fold line 975. The dispenser panel 901 can then be grasped at the opening formed at the access feature 978 and be pulled outwardly and upwardly to tear along the tear line 905. The tearing can be initiated at one access feature 978 or at both access features 978 simultane-

ously. For example, the tearing can be initiated at the access feature 978 in the first side panel 821 and the dispenser panel 901 can be pivoted upwardly as shown in Fig. 22 to form a dispenser opening 927. The dispenser panel 901 can be fully removed, in one embodiment, by continuing to tear along the tear line 905, and/or actuating the access feature 778 in the second side panel 823 and tearing along the side portions 913 of the tear line in the second side panel. The wrap 805 can be opened by alternative steps without departing from the disclosure.

[0060] As shown in Figs. 23 and 24, the dispenser panel 901 is fully removed with the handle 811. As shown in Fig. 24, the package 806 still can be carried after removal of the handle 811 with the dispenser panel 901 by grasping the end structures or secondary handles 812, 814 formed by the end panels 847, the gussets 844, and the portions of the top panel 831 remaining after removal of the dispenser panel 901. In one embodiment, the dispenser panel 901 can be tucked into the opened wrap 805 for display. For example, similarly to the configuration of the carton 605 of the fourth embodiment shown in Fig. 19, the dispenser panel 901 can be inserted into the dispenser opening 927 between a row of containers C and one of the first side panel 821 and the second side panel 823.

[0061] Fig. 25 illustrates an interior side 1001 of a blank 1003 for forming a carton 1005 according to a sixth embodiment of the disclosure. The sixth embodiment is generally similar to the fourth embodiment, except for variations noted and variations that will be apparent to one of ordinary skill in the art. Accordingly, similar or identical features of the embodiments have been given like or similar reference numbers. The blank 1003 has a longitudinal axis L1 and a lateral axis L2. The carton 1005 is illustrated in its erected state in Figs. 26-27. The carton 1005 includes a dispenser 1007 with a single-ply dispenser panel 1101. A handle 1011 extends in the dispenser panel 1101.

[0062] In the illustrated embodiment, the carton 1005 is sized to house four containers C in a single layer in a 2x2 arrangement, but it is understood that the carton may be sized and shaped to hold containers of a different or same quantity in more than one layer and/or in different row/column arrangements (e.g., 1x6, 3x6, 3x4, 2x6, 2x6x2, 3x4x2, 2x9, etc.). In the illustrated embodiment, the containers C can be 355-ml (12-oz) slim cans (e.g., aluminum cans); however, the containers C alternatively can be any style of container.

[0063] As shown in Fig. 25, the blank 1003 includes a bottom panel 1017, a first side panel 1021 foldably connected to the bottom panel 1017 along a lateral fold line 1025, a top panel 1031 foldably connected to the first side panel 1021 along a lateral fold line 1033, and a second side panel 1023 foldably connected to the top panel 1031 along a lateral fold line 1037. An attachment flap 1032 can be foldably connected to the bottom panel 1017 along a lateral fold line 1034. The attachment flap 1032 can be adhered to the interior surface of the second side

panel 1023 when erecting the carton 1005. Alternatively, the attachment flap can be foldably connected to the second side panel 1023 for being adhered to the bottom panel 1017 when the carton is erected.

[0064] The bottom panel 1017 is foldably connected to a first bottom end flap 1041a and a second bottom end flap 1041b. The first side panel 1021 is foldably connected to a first side end flap 1043a and a second side end flap 1043b. The second side panel 1023 is foldably connected to a first side end flap 1045a and a second side end flap 1045b. The top panel 1031 is foldably connected to a first top end flap 1047a and a second top end flap 1047b.

[0065] The end flaps 1041a, 1043a, 1045a, 1047a extend along a first marginal area of the blank 1003, and are foldably connected at a first longitudinal fold line 1051a that extends along the length of the blank. The end flaps 1041b, 1043b, 1045b, 1047b extend along a second marginal area of the blank 1003, and are foldably connected at a second longitudinal fold line 1051b that also extends along the length of the blank. When the carton 1005 is erected, the end flaps 1041a, 1043a, 1045a, 1047a close a first end 1055 of the carton, and the end flaps 1041b, 1043b, 1045b, 1047b close a second end 1057 of the carton. In accordance with an alternative embodiment of the present disclosure, different flap arrangements can be used for closing the ends 1055, 1057 of the carton 1005.

[0066] In the illustrated embodiment, the features that form the dispenser 1007 in the carton 1005 include the dispenser panel 1101 in the top panel 1031. The dispenser panel 1101 is formed by a tear line 1105 comprising lateral portions 1107 that are generally collinear with the lateral fold lines 1033, 1037. The tear line 1105 can include four oblique portions 1109 extending from respective ends of the lateral portions 1107 to respective longitudinal portions 1113, which can be generally collinear with the longitudinal fold lines 1051a, 1051b. The oblique portions of the tear line 1105 can be configured so that the slits forming the tear line do not interrupt or cut across the oblique fold lines 1093. Accordingly, the oblique fold lines 1093 can help direct the forces on the top panel 1031 at the handle 1011 to the corners of the carton 1005 when the weight of the carton 1005 is supported at the handle 1011.

[0067] As shown in Fig. 25, the dispenser 1007 further includes respective access features 1178 in the top panel 1031. Each of the access features can include access flaps 1176 at least partially defined by curved tear lines 1173. Alternatively, the tear lines 1173 could be cuts. The access flaps 1176 can be further defined by the respective longitudinal fold lines 1151a, 1151b. The dispenser panel 1101, the tear line 1105, and/or the access features 1178 can be omitted or otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0068] The features that comprise the handle 1011 include a handle flap 1075 in the top panel 1031, within

the dispenser panel 1101. The handle flap 1075 can be foldably connected to the top panel 1031 along a lateral fold line 1076 and can be separable from the top panel 1031 along a curved cut or tear line. In another embodiment, the lateral fold line 1076 could be replaced by a longitudinal or oblique fold line for a different orientation of the handle flap 1075. The handle flap 1075 could be otherwise shaped, arranged, and/or configured without departing from the disclosure, and the blank 1003 could have other features for forming the handle 1011 without departing from the disclosure. For example, the handle flap could be omitted, and the handle could include one or more handle apertures in the top panel. In an alternative example, the handle 1011 can include a plurality of handle flaps in the top panel.

[0069] The erected carton 1005 is shown in Fig. 26. In one embodiment, the handle flap 1075 can be folded inwardly for carrying the carton. The dispenser 1007 can be activated by initiating tearing at the access features 1178. A user can push the access flaps 1176 into the interior of the carton, folding the access flaps inwardly along the respective longitudinal fold lines 1051a, 1051b, and separating the access flaps 1176 from the dispenser panel 1101 along the curved tear lines 1173. The dispenser panel 1101 then can be grasped at one or both of the openings formed at the access features 1178 and be pulled upwardly to tear the tear line 1105 along the longitudinal portions 1113, then the oblique portions 1109, and then the lateral portions 1107. The tearing can be initiated at one access feature 1178 or at both access features 1178 simultaneously. For example, in one embodiment, the tearing can be initiated at the access feature 1178 adjacent the second end 1157 of the carton 1005, and the dispenser panel 1101 can be pivoted upwardly along the longitudinal portions 1113 that are generally collinear with the first longitudinal fold line 1051a to form a dispenser opening 1127. The dispenser panel 1101 can be fully removed from the carton by tearing along the remaining longitudinal portions 1113 of the tear line 1105. The carton 1005 can be opened by alternative steps without departing from the disclosure.

[0070] As shown in Fig. 27, the dispenser panel 1101 can be fully removed with the handle 1011. Corner portions 1084 can be formed at the four corners of the top panel 1031 and can remain connected to the remainder of the carton 1005 when the dispenser panel 1101 is removed. As shown in Figs. 26 and 27, the corner portions 1084 are defined by the oblique portions 1109 of the tear line 1105. Accordingly, the corner portions 1084 can partially retain containers C in the carton 1005 after removal of dispenser panel 1101 to help inhibit undesired removal of the containers C, but allow a user to remove the containers when desired. The top panel 1031, the dispenser 1007, and the corner portions 1084 can be omitted or otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0071] Fig. 28 illustrates an exterior side 1201 of a blank 1203 for forming a carton 1205 according to a sev-

enth embodiment of the disclosure. The seventh embodiment is generally similar to the third embodiment, except for variations noted and variations that will be apparent to one of ordinary skill in the art. Accordingly, similar or identical features of the embodiments have been given like or similar reference numbers. The blank 1203 has a longitudinal axis L1 and a lateral axis L2. The carton 1205 is illustrated in its erected state in Figs. 29-31. The carton 1205 includes a dispenser 1207. A handle 1211 extends in the dispenser 1207 in one end of the carton 1205, and a handle 1212 extends in the opposing end of the carton 1205, outside the dispenser 1207.

[0072] In the illustrated embodiment, the carton 1205 is sized to house twelve containers C (Fig. 31) in a single layer in a 3x4 arrangement, but it is understood that the carton may be sized and shaped to hold containers of a different or same quantity in more than one layer and/or in different row/column arrangements (e.g., 1x6, 3x6, 4x4, 2x6, 2x6x2, 3x4x2, 2x9, etc.). In the illustrated embodiment, the containers C can be 355-ml (12-oz) bottles (e.g., glass bottles); however, the containers C alternatively can be any style of container.

[0073] As shown in Fig. 28, the blank 1203 includes a bottom panel 1217, a first side panel 1221 foldably connected to the bottom panel 1217 along a lateral fold line 1225, a top panel 1231 foldably connected to the first side panel 1221 along a lateral fold line 1233, and a second side panel 1223 foldably connected to the bottom panel 1217 along a lateral fold line 1237. An attachment flap 1232 can be foldably connected to the top panel 1231 along a lateral fold line 1234. The attachment flap 1232 can be adhered to the interior surface of the second side panel 1223 when erecting the carton 1205. Alternatively, the attachment flap can be foldably connected to the second side panel 1223 for being adhered to the bottom panel 1217 when the carton is erected.

[0074] End flaps 1241a, 1243a, 1245a, 1247a can extend along a first marginal area of the blank 1203, and are foldably connected to the respective panels at a first longitudinal fold line 1251a that extends along the length of the blank. End flaps 1241b, 1243b, 1245b, 1247b can extend along a second marginal area of the blank 1203, and are foldably connected to the respective panels at a second longitudinal fold line 1251b that also extends along the length of the blank. When the carton 1205 is erected, the end flaps 1241a, 1243a, 1245a, 1247a close a first end 1255 of the carton, and the end flaps 1241b, 1243b, 1245b, 1247b close a second end 1257 of the carton. In accordance with an alternative embodiment of the present disclosure, different flap arrangements can be used for closing the ends 1255, 1257 of the carton 1205.

[0075] In the illustrated embodiment, the blank 1203 can include diamond corner panels and the top panel 1231 is smaller in the longitudinal L1 direction and the lateral L2 direction. Accordingly, the upper portions of the side panels 1221, 1223 and the ends 1255, 1257 can taper inwardly to help secure the tapered upper portions

of the containers C within the carton 1205. Alternatively, less than all of the sides and ends of the carton can be tapered.

[0076] In the illustrated embodiment, the features that form the dispenser 1207 in the carton 1205 include a first dispenser panel 1301 in the top panel 1231, the first side panel 1221, the attachment flap 1232, the top end flap 1247b, and the side end flap 1243b. The dispenser 1207 further includes a second dispenser panel 1303 in the second side panel 1223 and the side end flap 1245b. The dispenser panels 1301, 1303 are formed by a tear line 1305 comprising a first portion 1307 extending in the top panel 1231, the first side panel 1221, and the side end flap 1243b; a second portion 1309 extending in the top panel 1231 and the attachment flap 1232; and a third portion 1311 extending in the second side panel 1223 and the side end flap 1245b. A fourth portion 1313 of the tear line 1305 extends in the second top end flap 1247b. In the erected carton, the third portion 1311 partially overlaps the second portion 1309 where the second side panel 1223 overlaps the attachment flap 1232. Additionally, the fourth portion 1313 overlaps the first and third portions 1307, 1311 where the top end flap 1247b overlaps the side end flaps 1243b, 1245b at the closed end 1257 of the carton. In the erected carton 1205, the dispenser panels 1301, 1303 form a dispenser panel 1325 (Figs. 29-31).

[0077] As shown in Fig. 28, the dispenser 1207 further includes an access feature 1378 in the top panel 1231. The access feature can include an access flap 1376 at least partially defined by a curved cut or tear line 1373. The access flap 1376 can be further defined by a curved fold line 1375. The dispenser panel 1301 can also include a longitudinal fold line 1390 to help in lifting the dispenser panel 1325 while tearing along the tear line 1305. The dispenser panels 1301, 1303, the tear line 1305, and/or the access feature 1378 can be omitted or otherwise shaped, arranged, and/or configured without departing from the disclosure.

[0078] The features that comprise the handle 1211 in the closed end 1257 of the carton 1205 include a handle flap 1275a in the top end flap 1247b, which overlaps the handle flaps 1275b and 1275c in the respective side end flaps 1243b, 1245b. The handle flaps 1275a, 1275b, 1275c extend within portions of the dispenser panel 1301. The handle flap 1275a can be foldably connected to the respective end flaps 1247b, 1243b, 1245b and can be separable from the same along respective curved cut or tear lines. The handle flaps 1275a, 1275b, 1275c could be otherwise shaped, arranged, and/or configured without departing from the disclosure, and the blank 1203 could have other features for forming the handle 1211 without departing from the disclosure. For example, one or more of the handle flaps could be omitted, and the handle could include handle apertures and/or one or more handle flaps in combination with one or more handle apertures. The handle 1212 in the closed end 1255 can be substantially similar or identical to the handle 1211 in

the illustrated embodiment. Alternatively, the handle 1212 could be omitted or otherwise configured.

[0079] The erected carton 1205 is shown in Fig. 29 and 30. The dispenser 1207 can be activated by initiating tearing at the access feature 1378. A user can push the access flap 1376 into the interior of the carton, folding the access flap inwardly along the curved fold line 1375, and separating the access flap from the top panel 1231 along the curved tear line 1373. The dispenser panel 1325 can then be grasped at the opening formed at the access feature 1378 and can be pulled upwardly to tear the dispenser panel away from the top panel 1231, the side panels 1221, 1223, and the closed end 1257 to form a dispenser opening 1327 (Fig. 31). As shown in Fig. 31, the dispenser panel 1325 is fully removed with the handle 1211. In the illustrated embodiment, it is easier to tear the tear line 1305 from the access feature 1378 in the top panel 1231 than from the closed end 1257 of the carton 1205 (e.g., due to the multiple overlapping layers that the tear line extends through in the closed end). Accordingly, the configuration of the tear line 1305 can help avoid unwanted tearing in the carton 1205 when carrying the carton from the handle 1211. The carton 1205 can be opened by alternative steps without departing from the disclosure.

[0080] Any of the features of the various embodiments of the disclosure can be combined with, replaced by, or otherwise configured with other features of other embodiments of the disclosure without departing from the scope of this disclosure. Further, it is noted that the dispenser features and/or handle features of the various embodiments can be incorporated into a carton having any carton style or panel configuration. The carton styles and panel configurations described above are included by way of example.

[0081] Cartons or blanks according to the principles of the present disclosure may be formed from materials such as paperboard. Therefore, if exposed to water or other liquids for extended periods of time, the carton may allow for the passage of liquid through the wetted carton surfaces due to partial permeability of the carton material. In this specification, the term "liquid-tight" is generally used to define a section of a carton that is formed from a continuous section of material or of a section without any glued seams through which liquid or fine particulate matter might leak, and the term "liquid-tight" therefore encompasses cartons that may become partially water permeable over time.

[0082] The blanks according to the present disclosure can be, for example, formed from coated paperboard and similar materials. For example, the interior and/or exterior sides of the blanks can be coated with a clay coating. The clay coating may then be printed over with product, advertising, price coding, and other information or images. The blanks may then be coated with a varnish to protect any information printed on the blanks. The blanks may also be coated with, for example, a moisture barrier layer, on either or both sides of the blanks.

[0083] In accordance with the exemplary embodiments, the blanks may be constructed of paperboard of a caliper such that it is heavier and more rigid than ordinary paper. For example, the caliper can be at least about 24, but the caliper may be more or less than this amount without departing from the disclosure. The blanks can also be constructed of other materials, such as cardboard, hard paper, or any other material having properties suitable for enabling the carton package to function at least generally as described above. The blanks can also be laminated to or coated with one or more sheetlike materials at selected panels or panel sections.

[0084] In accordance with the exemplary embodiment of the present disclosure, a fold line can be any substantially linear, although not necessarily straight, form of weakening that facilitates folding therealong. More specifically, but not for the purpose of narrowing the scope of the present disclosure, fold lines include: a score line, such as lines formed with a blunt scoring knife, or the like, which creates a crushed portion in the material along the desired line of weakness; a cut that extends partially into a material along the desired line of weakness, and/or a series of cuts that extend partially into and/or completely through the material along the desired line of weakness; and various combinations of these features. In situations where cutting is used to create a fold line, typically the cutting will not be overly extensive in a manner that might cause a reasonable user to incorrectly consider the fold line to be a tear line.

[0085] As an example, a tear line can include: a slit that extends partially into the material along the desired line of weakness, and/or a series of spaced apart slits that extend partially into and/or completely through the material along the desired line of weakness, or various combinations of these features. As a more specific example, one type tear line is in the form of a series of spaced apart slits that extend completely through the material, with adjacent slits being spaced apart slightly so that a nick (e.g., a small somewhat bridging-like piece of the material) is defined between the adjacent slits for typically temporarily connecting the material across the tear line. The nicks are broken during tearing along the tear line. The nicks typically are a relatively small percentage of the tear line, and alternatively the nicks can be omitted from or torn in a tear line such that the tear line is a continuous cut line. That is, it is within the scope of the present disclosure for each of the tear lines to be replaced with a continuous slit, or the like. For example, a cut line can be a continuous slit or could be wider than a slit without departing from the present disclosure.

[0086] The above embodiments may be described as having one or panels adhered together by glue. The term "glue" is intended to encompass all manner of adhesives commonly used to secure carton panels in place.

[0087] The foregoing description illustrates and describes various examples of the present disclosure. As various changes could be made in the above construction without departing from the scope of the disclosure, it is

intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. Additionally, the disclosure shows and describes only selected embodiments but is capable of use in various other combinations, modifications, and environments and is capable of changes or modifications within the scope of the invention as defined in the appended claims, commensurate with the above teachings, and/or within the skill or knowledge of the relevant art.

Claims

1. A carton (5; 205) for holding a plurality of containers (C), the carton comprising:

a plurality of panels (17, 21, 23, 31, 35; 217, 221, 223, 231, 235) extending at least partially around an interior of the carton;

a dispenser (7; 207) comprising a dispenser panel (101, 103, 125; 301, 303, 325), the dispenser panel being at least partially defined by a tear line (105, 115; 305, 315) extending in at least one panel (31, 35; 231, 235) of the plurality of panels, the dispenser panel being at least partially removable from the carton to create a dispenser opening (127; 327); and

a handle (11; 211) for grasping and carrying the carton, the handle comprising a handle feature (75, 76, 77a, 77b, 79a, 79b, 83a, 83b, 85a, 85b, 87a, 87b, 89a, 89b, 91, 93a, 93b; 275, 276, 277a, 277b, 279a, 279b, 283a, 283b, 285a, 285b, 287a, 287b, 289a, 289b, 291, 293a, 293b) extending in at least the dispenser panel, at least a portion of the handle being removable from the carton with the dispenser panel,

characterized in that the tear line comprises a first directional portion (161, 165; 361, 365) and a second directional portion (163, 167; 363, 367), a first end of the first directional portion being adjacent a second end of the second directional portion, the first directional portion is configured to be torn toward the first end of the first directional portion, and the second directional portion is configured for being torn toward the second end of the second directional portion.

2. The carton of claim 1, wherein the handle feature comprises a handle grip (77a, 77b; 277a, 277b) extending in at least the dispenser panel, the first end of the first directional portion and the second end of the second directional portion being generally aligned with the handle grip.

3. The carton of claim 1, wherein the at least one panel comprises a centerline (C_L), and the first end of the first directional portion and the second end of the

second directional portion are adjacent the centerline.

4. The carton of claim 1, wherein:

the tear line comprises a series of slits (106) and nicks (108), each slit comprising a main portion (110) generally directed along the contour of the tear line and an oblique portion (114) that is oblique with respect to the main portion; the oblique portion is closer to the first end of the first directional portion of the tear line than the respective main portion for each slit in the first directional portion; and the oblique portion is closer to the second end of the second directional portion of the tear line than the respective main portion for each slit in the second directional portion.

5. The carton of claim 1, wherein the handle feature comprises a handle panel (75, 76; 275, 276) having a handle grip (77a, 77b; 277a, 277b) extending in at least the dispenser panel, at least a portion of the handle grip being removable from the carton with the dispenser panel, the handle further comprises a handle aperture (79a, 79b; 279a, 279b), the handle grip extending adjacent the handle aperture.

6. The carton of claim 1, wherein:

the at least one panel comprises a score line (93a, 93b; 293a, 293b) extending from a corner of the at least one panel toward the handle; and the tear line comprises a series of slits (106) and nicks (108) and a gap (160; 360) between two of the slits, the gap being aligned with the score line.

7. The carton of claim 1, wherein the plurality of panels comprises a first panel (31, 35; 231, 235) foldably connected to a second panel (21, 23; 221, 223), the dispenser panel comprises at least a portion of the first panel, and the handle feature is disposed in at least the first panel,

the handle feature comprises a handle flap (83a, 83b, 87a, 87b; 283a, 283b, 287a, 287b) foldably connected to the first panel, the first panel is a top panel (31, 35; 231, 235) and the second panel is a side panel (21, 23; 221, 223).

8. A blank (3; 203) for forming a carton (5; 205) for holding a plurality of containers (C), the blank comprising:

a plurality of panels (17, 21, 23, 31, 35; 217, 221, 223, 231, 235); dispenser features (101, 103, 105, 115; 301, 303, 305, 315) for forming a dispenser (7; 207)

in the carton formed from the blank, the dispenser features comprising a dispenser panel (101, 103; 301, 303) at least partially defined by a tear line (105, 115; 305, 315) extending in at least one panel (31, 35; 231, 235) of the plurality of panels, the dispenser panel being at least partially removable from the carton formed from the blank; and

handle features (75, 76, 77a, 77b, 79a, 79b, 83a, 83b, 85a, 85b, 87a, 87b, 89a, 89b, 91, 93a, 93b; 275, 276, 277a, 277b, 279a, 279b, 283a, 283b, 285a, 285b, 287a, 287b, 289a, 289b, 291, 293a, 293b) for forming a handle (11; 211) in the carton formed from the blank, the handle features extending in at least the dispenser panel, at least a portion of the handle features being removable from the carton formed from the blank with the dispenser panel,

characterized in that the tear line comprises a first directional portion (161, 165; 361, 365) and a second directional portion (163, 167; 363, 367), a first end of the first directional portion being adjacent a second end of the second directional portion, the first directional portion is configured to be torn toward the first end of the first directional portion, and the second directional portion is configured for being torn toward the second end of the second directional portion.

9. The blank of claim 8, wherein the handle feature comprises a handle grip (77a, 77b; 277a, 277b) extending in at least the dispenser panel, the first end of the first directional portion and the second end of the second directional portion being generally aligned with the handle grip.

10. The blank of claim 8, wherein:

the tear line comprises a series of slits (106) and nicks (108), each slit comprising a main portion (110) generally directed along the contour of the tear line and an oblique portion (114) that is oblique with respect to the main portion; the oblique portion is closer to the first end of the first directional portion of the tear line than the respective main portion for each slit in the first directional portion; and the oblique portion is closer to the second end of the second directional portion of the tear line than the respective main portion for each slit in the second directional portion.

11. The blank of claim 8, wherein the handle feature comprises a handle panel (75, 76; 275, 276) having a handle grip (77a, 77b; 277a, 277b) extending in at least the dispenser panel, at least a portion of the handle grip being removable from the carton formed from the blank with the dispenser panel,

the handle further comprises a handle aperture (79a, 79b; 279a, 279b), the handle grip extending adjacent the handle aperture.

12. The blank of claim 8, wherein:

the at least one panel comprises a score line (93a, 93b; 293a, 293b) extending from a corner of the at least one panel toward the handle; and the tear line comprises a series of slits (106) and nicks (108) and a gap (160; 360) between two of the slits, the gap being aligned with the score line.

13. A method of opening a carton (5; 205), the method comprising:

obtaining a carton (5; 205) comprising a plurality of panels (17, 21, 23, 31, 35; 217, 221, 223, 231, 235) extending at least partially around an interior of the carton, a dispenser (7; 207) comprising a dispenser panel (101, 103, 125; 301, 303, 325), and a handle (11; 211) for grasping and carrying the carton, the dispenser panel being at least partially defined by a tear line (105, 115; 305, 315) extending in at least one panel (31, 35; 231, 235) of the plurality of panels, and the handle comprising a handle feature (75, 76, 77a, 77b, 79a, 79b, 83a, 83b, 85a, 85b, 87a, 87b, 89a, 89b, 91, 93a, 93b; 275, 276, 277a, 277b, 279a, 279b, 283a, 283b, 285a, 285b, 287a, 287b, 289a, 289b, 291, 293a, 293b) extending in at least the dispenser panel;

at least partially removing the dispenser panel to form a dispenser opening (127; 327) in the carton, the dispenser opening providing access to the interior of the carton, wherein the at least partially removing the dispenser panel comprises at least partially removing the handle feature in the dispenser panel,

characterized in that the tear line comprises a first directional portion (161, 165; 361, 365) and a second directional portion (163, 167; 363, 367), a first end of the first directional portion being adjacent a second end of the second directional portion, the at least partially removing the dispenser panel comprising tearing the first directional portion toward the first end of the first directional portion and tearing the second directional portion toward the second end of the second directional portion.

14. The method of claim 13, wherein the handle feature comprises a handle panel (75, 76; 275, 276) having a handle grip (77a, 77b; 277a, 277b) extending in at least the dispenser panel adjacent a handle aperture (79a, 79b; 279a, 279b), at least a portion of the handle grip being removable from the carton with the

dispenser panel.

Patentansprüche

1. Karton (5; 205) zum Halten einer Vielzahl von Behältern (C), wobei der Karton umfasst:

eine Vielzahl von Feldern (17, 21, 23, 31, 35; 217, 221, 223, 231, 235), die sich wenigstens teilweise um ein Inneres des Kartons erstrecken; einen Spender (7; 207), der ein Spenderfeld (101, 103, 125; 301, 303, 325) umfasst, wobei das Spenderfeld wenigstens teilweise durch eine Aufreißlinie (105, 115; 305, 315) begrenzt ist, die sich in wenigstens ein Feld (31, 35; 231, 235) der Vielzahl von Feldern hinein erstreckt, wobei das Spenderfeld wenigstens teilweise vom Karton entferntbar ist, um eine Spenderöffnung (127; 327) zu bilden; und einen Handgriff (11; 211) zum Ergreifen und Tragen des Kartons, wobei der Handgriff ein Handgriffmerkmal (75, 76, 77a, 77b, 79a, 79b, 83a, 83b, 85a, 85b, 87a, 87b, 89a, 89b, 91, 93a, 93b; 275, 276, 277a, 277b, 279a, 279b, 283a, 283b, 285a, 285b, 287a, 287b, 289a, 289b, 291, 293b, 293, 293b) aufweist, das sich in wenigstens dem Spenderfeld erstreckt, wobei wenigstens ein Abschnitt des Handgriffs vom Karton mit dem Spenderfeld abnehmbar ist, **dadurch gekennzeichnet, dass** die Aufreißlinie einen ersten Richtungsabschnitt (161, 165; 361, 365) und einen zweiten Richtungsabschnitt (163, 167; 363, 367) umfasst, wobei ein erstes Ende des ersten Richtungsabschnitts einem zweiten Ende des zweiten Richtungsabschnitts benachbart ist, wobei der erste Richtungsabschnitt so konfiguriert ist, um in Richtung des ersten Endes des ersten Richtungsabschnitts aufgerissen zu werden, und wobei der zweite Richtungsabschnitt so konfiguriert ist, um in Richtung des zweiten Endes des zweiten Richtungsabschnitts aufgerissen zu werden.

2. Karton nach Anspruch 1, wobei das Handgriffmerkmal einen Handgriff (77a, 77b; 277a, 277b) umfasst, der sich in wenigstens dem Spenderfeld, dem ersten Ende des ersten Richtungsabschnitts und dem zweiten Ende des zweiten Richtungsabschnitts erstreckt, die im Allgemeinen mit dem Handgriff ausgerichtet sind.
3. Karton nach Anspruch 1, wobei das wenigstens eine Feld eine Mittellinie (C_L) umfasst und das erste Ende des ersten Richtungsabschnitts und das zweite Ende des zweiten Richtungsabschnitts neben der Mittellinie liegen.

4. Karton nach Anspruch 1, wobei:

die Aufreißlinie eine Reihe von Schlitz (106) und Kerben (108) umfasst, wobei jeder Schlitz einen Hauptabschnitt (110), der allgemein entlang der Kontur der Aufreißlinie ausgerichtet ist, und einen schrägen Abschnitt (114) umfasst, der in Bezug auf den Hauptabschnitt schräg ist; der schräge Abschnitt näher am ersten Ende des ersten Richtungsabschnitts der Aufreißlinie liegt als der jeweilige Hauptabschnitt für jeden Schlitz im ersten Richtungsabschnitt; und der schräge Abschnitt näher am zweiten Ende des zweiten Richtungsabschnitts der Aufreißlinie liegt als der jeweilige Hauptabschnitt für jeden Schlitz im zweiten Richtungsabschnitt.

5. Karton nach Anspruch 1, wobei das Handgriffmerkmal ein Handgriff (75, 76; 275, 276) umfasst, das einen Handgriff (77a, 77b; 277a, 277b) aufweist, der sich wenigstens im Spenderfeld erstreckt, wobei wenigstens ein Abschnitt des Handgriffs vom Karton mit dem Spenderfeld abnehmbar ist, wobei der Handgriff ferner eine Handgrifföffnung (79a, 79b; 279a, 279b) umfasst, wobei sich der Handgriff neben der Handgrifföffnung erstreckt.

6. Karton nach Anspruch 1, wobei:

das wenigstens eine Feld eine Kerblinie (93a, 93b; 293a, 293b) umfasst, die sich von einer Ecke des wenigstens einen Feldes zum Handgriff hin erstreckt; und die Aufreißlinie eine Reihe von Schlitz (106) und Kerben (108) und einen Spalt (160; 360) zwischen zwei der Schlitz umfasst, wobei der Spalt mit der Kerblinie ausgerichtet ist.

7. Karton nach Anspruch 1, wobei die Vielzahl von Feldern ein erstes Feld (31, 35; 231, 235) umfasst, das faltbar mit einem zweiten Feld (21, 23; 221, 223) verbunden ist, wobei das Spenderfeld wenigstens einen Abschnitt des ersten Feldes umfasst und das Handgriffmerkmal in wenigstens dem ersten Feld angeordnet ist, wobei das Handgriffmerkmal eine Handgriffklappe (83a, 83b, 87a, 87b; 283a, 283b, 287a, 287b) umfasst, die faltbar mit dem ersten Feld verbunden ist, das erste Feld ein oberes Feld (31, 35; 231, 235) ist und das zweite Feld ein Seitenfeld (21, 23; 221, 223) ist.

8. Zuschnitt (3; 203) zum Bilden eines Kartons (5; 205) zum Halten einer Vielzahl von Behältern (C), wobei der Zuschnitt umfasst:

eine Vielzahl von Feldern (17, 21, 23, 31, 35; 217, 221, 223, 231, 235);

Spendermerkmale (101, 103, 105, 115; 301,303,305,315) zum Ausbilden eines Spenders (7; 207) in dem aus dem Zuschnitt gebildeten Karton, wobei die Spendermerkmale ein Spenderfeld (101, 103; 301, 303) umfassen, das wenigstens teilweise durch eine Aufreißlinie (105, 115; 305, 315) definiert ist, die sich in wenigstens einem Feld (31, 35; 231, 235) der Vielzahl von Feldern erstreckt, wobei das Spenderfeld wenigstens teilweise vom Karton entfernt werden kann, der aus dem Zuschnitt gebildet wird; und

Handgriffmerkmale (75, 76, 77a, 77b, 79a, 79b, 83a, 83b, 85a, 85b, 87a, 87b, 89a, 89b, 91, 93a, 93b; 275, 276, 277a, 277b, 279a, 279b, 283a, 283b, 285a, 285b, 287a, 287b, 289a, 289b, 291, 293a, 293b) zum Ausbilden eines Handgriffs (11; 211) im aus dem Zuschnitt gebildeten Karton, wobei sich die Handgriffmerkmale in wenigstens dem Spenderfeld erstrecken, wobei wenigstens ein Abschnitt der Handgriffmerkmale vom Karton entfernt werden kann, der aus dem Zuschnitt mit dem Spenderfeld ausgebildet wird,

dadurch gekennzeichnet, dass

die Aufreißlinie einen ersten Richtungsabschnitt (161, 165; 361, 365) und einen zweiten Richtungsabschnitt (163, 167; 363, 367) umfasst, wobei ein erstes Ende des ersten Richtungsabschnitts einem zweiten Ende des zweiten Richtungsabschnitts benachbart ist, wobei der erste Richtungsabschnitt so konfiguriert ist, um in Richtung des ersten Endes des ersten Richtungsabschnitts aufgerissen zu werden, und der zweite Richtungsabschnitt so konfiguriert ist, um in Richtung des zweiten Endes des zweiten Richtungsabschnitts aufgerissen zu werden.

9. Zuschnitt nach Anspruch 8, wobei das Handgriffmerkmal einen Handgriff (77a, 77b; 277a, 277b) umfasst, der sich in wenigstens dem Spenderfeld, dem ersten Ende des ersten Richtungsabschnitts und dem zweiten Ende des zweiten Richtungsabschnitts erstreckt, die im Allgemeinen mit dem Handgriff ausgerichtet sind.

10. Zuschnitt nach Anspruch 8, wobei:

die Aufreißlinie eine Reihe von Schlitz (106) und Kerben (108) umfasst, wobei jeder Schlitz einen Hauptabschnitt (110), der allgemein entlang der Kontur der Aufreißlinie ausgerichtet ist, und einen schrägen Abschnitt (114) umfasst, der in Bezug auf den Hauptabschnitt schräg ist; der schräge Abschnitt näher am ersten Ende des ersten Richtungsabschnitts der Aufreißlinie liegt als der jeweilige Hauptabschnitt für jeden Schlitz im ersten Richtungsabschnitt; und

der schräge Abschnitt näher am zweiten Ende des zweiten Richtungsabschnitts der Aufreißlinie liegt als der jeweilige Hauptabschnitt für jeden Schlitz im zweiten Richtungsabschnitt.

11. Zuschnitt nach Anspruch 8, wobei das Handgriffmerkmal ein Handgriffeld (75, 76; 275, 276) umfasst, das einen Handgriff (77a, 77b; 277a, 277b) aufweist, der sich wenigstens in das Spenderfeld hinein erstreckt, wobei wenigstens ein Abschnitt des Handgriffs vom Karton, der aus dem Zuschnitt mit dem Spenderfeld ausgebildet wird, abnehmbar ist, wobei der Handgriff ferner eine Handgrifföffnung (79a, 79b; 279a, 279b) umfasst, wobei sich der Handgriff neben der Handgrifföffnung erstreckt.

12. Zuschnitt nach Anspruch 8, wobei:

das wenigstens eine Feld eine Kerblinie (93a, 93b; 293a, 293b) umfasst, die sich von einer Ecke des wenigstens einen Feldes zum Handgriff hin erstreckt; und
die Aufreißlinie eine Reihe von Schlitz (106) und Kerben (108) und einen Spalt (160; 360) zwischen zwei der Schlitz umfasst, wobei der Spalt mit der Kerblinie ausgerichtet ist.

13. Verfahren zum Öffnen eines Kartons (5; 205), wobei das Verfahren umfasst:

Erhalten eines Kartons (5; 205) mit einer Vielzahl von Feldern (17, 21, 23, 31, 35; 217, 221, 223, 231, 235), die sich wenigstens teilweise um ein Inneres des Kartons erstrecken, mit einem Spender (7; 207), der ein Spenderfeld (101, 103, 125; 301,303, 325) und einen Handgriff (11; 211) zum Ergreifen und Tragen des Kartons umfasst, wobei das Spenderfeld wenigstens teilweise durch eine Aufreißlinie (105, 115; 305, 315), die sich in wenigstens einem Feld (31, 35; 231, 235) der Vielzahl von Feldern erstreckt, definiert ist und wobei der Handgriff ein Handgriffmerkmal (75, 76, 77a, 77b, 79a, 79b, 83a, 83b, 85a, 85b, 87a, 87b, 89a, 89b, 91, 93a, 93b; 275, 276, 277a, 277a, 279a, 279b, 283a, 283b, 285a, 285b, 287a, 287b, 289a, 289b, 291, 293a, 293b) umfasst, das sich in wenigstens dem Spenderfeld erstreckt;

wenigstens teilweises Entfernen des Spenderfeldes, um eine Spenderöffnung (127; 327) im Karton auszubilden, wobei die Spenderöffnung Zugang zum Inneren des Kartons bietet, wobei das wenigstens teilweise Entfernen des Spenderfeldes das wenigstens teilweise Entfernen des Handgriffmerkmals im Spenderfeld umfasst,

dadurch gekennzeichnet, dass

die Aufreißlinie einen ersten Richtungsabschnitt

(161, 165; 361, 365) und einen zweiten Richtungsabschnitt (163, 167; 363, 367) umfasst, wobei ein erstes Ende des ersten Richtungsabschnitts einem zweiten Ende des zweiten Richtungsabschnitts benachbart ist, wobei das wenigstens teilweise Entfernen des Spenderfeldes das Aufreißen des ersten Richtungsabschnitts in Richtung des ersten Endes des ersten Richtungsabschnitts und das Aufreißen des zweiten Richtungsabschnitts in Richtung des zweiten Endes des zweiten Richtungsabschnitts umfasst.

14. Verfahren nach Anspruch 13, wobei das Handgriffmerkmal ein Handgriffeld (75, 76; 275, 276) umfasst, das einen Handgriff (77a, 77b; 277a, 277b) aufweist, der sich in wenigstens das Spenderfeld neben einer Handgrifföffnung (79a, 79b; 279a, 279b) hinein erstreckt, wobei wenigstens ein Abschnitt des Handgriffs vom Karton mit dem Spenderfeld abnehmbar ist.

Revendications

1. Carton (5 ; 205) destiné à contenir une pluralité de conteneurs (C), le carton comprenant :

une pluralité de panneaux (17, 21, 23, 31, 35 ; 217, 221, 223, 231, 235) s'étendant au moins partiellement autour d'un intérieur du carton ;
un distributeur (7 ; 207) comprenant un panneau de distributeur (101, 103 ; 125 ; 301, 303, 325), le panneau de distributeur étant au moins partiellement défini par une ligne de déchirure (105, 115 ; 305, 315) s'étendant dans au moins un panneau (31, 35 ; 231, 235) parmi la pluralité de panneaux, le panneau de distributeur étant au moins partiellement détachable du carton pour créer une ouverture de distributeur (127 ; 327) ;
et

une poignée (11 ; 211) permettant de saisir et de porter le carton, la poignée comprenant un élément de poignée (75, 76, 77a, 77b, 79a, 79b, 83a, 83b, 85a, 85b, 87a, 87b, 89a, 89b, 91, 93a, 93b ; 275, 276, 277a, 277b, 279a, 279b, 283a, 283b, 285a, 285b, 287a, 287b, 289a, 289b, 291, 293a, 293b) s'étendant au moins dans le panneau de distributeur, au moins une partie de la poignée étant détachable du carton avec le panneau de distributeur,

caractérisé en ce que

la ligne de déchirure comprend une première partie directionnelle (161, 165 ; 361, 365) et une deuxième partie directionnelle (163, 167 ; 363, 367), une première extrémité de la première partie directionnelle étant adjacente à une deuxième extrémité de la deuxième partie direction-

nelle, la première partie directionnelle est configurée pour être déchirée vers la première extrémité de la première partie directionnelle, et la deuxième partie directionnelle est configurée pour être déchirée vers la deuxième extrémité de la deuxième partie directionnelle.

2. Carton selon la revendication 1, dans lequel l'élément de poignée comprend une prise de poignée (77a, 77b ; 277a, 277b) s'étendant au moins dans le panneau de distributeur, la première extrémité de la première partie directionnelle et la deuxième extrémité de la deuxième partie directionnelle étant généralement alignées avec la prise de poignée.

3. Carton selon la revendication 1, dans lequel l'au moins un panneau comprend une ligne médiane (C_L), et la première extrémité de la première partie directionnelle et la deuxième extrémité de la deuxième partie directionnelle sont adjacentes à la ligne médiane.

4. Carton selon la revendication 1, dans lequel :

la ligne de déchirure comprend une série de fentes (106) et d'entailles (108), chaque fente comprenant une partie principale (110) généralement dirigée le long du contour de la ligne de déchirure et une partie oblique (114) oblique par rapport à la partie principale ;
la partie oblique est plus proche de la première extrémité de la première partie directionnelle de la ligne de déchirure que la partie principale respective pour chaque fente dans la première partie directionnelle ; et
la partie oblique est plus proche de la deuxième extrémité de la deuxième partie directionnelle de la ligne de déchirure que la partie principale respective pour chaque fente dans la deuxième partie directionnelle.

5. Carton selon la revendication 1, dans lequel l'élément de poignée comprend un panneau de poignée (75, 76 ; 275, 276) comportant une prise de poignée (77a, 77b ; 277a, 277b) s'étendant au moins dans le panneau de distributeur, au moins une partie de la prise de poignée étant détachable du carton avec le panneau de distributeur, la poignée comprenant en outre une ouverture de poignée (79a, 79b ; 279a, 279b), la prise de poignée s'étendant à côté de l'ouverture de poignée.

6. Carton selon la revendication 1, dans lequel :

l'au moins un panneau comprend une ligne de coupe (93a, 93b ; 293a, 293b) s'étendant à partir d'un coin de l'au moins un panneau vers la poignée ; et

la ligne de déchirure comprend une série de fentes (106) et d'entailles (108) et un espacement (160 ; 360) entre deux des fentes, l'espacement étant aligné avec la ligne de coupe.

7. Carton selon la revendication 1, dans lequel la pluralité de panneaux comprend un premier panneau (31, 35 ; 231, 235) relié de façon pliable à un deuxième panneau (21, 23 ; 221, 223), le panneau de distributeur comprend au moins une partie du premier panneau, et l'élément de poignée est disposé au moins dans le premier panneau ; l'élément de poignée comprend un rabat de poignée (83a, 83b, 87a, 87b ; 283a, 283b, 287a, 287b) relié de façon pliable au premier panneau, le premier panneau est un panneau supérieur (31, 35 ; 231, 235) et le deuxième panneau est un panneau latéral (21, 23 ; 221, 223).

8. Découpe (3 ; 203) permettant de former un carton (5 ; 205) destiné à contenir une pluralité de conteneurs (C), la découpe comprenant :

une pluralité de panneaux (17, 21, 23, 31, 35 ; 217, 221, 223, 231, 235) ;
des éléments de distributeur (101, 103, 105, 115 ; 301, 303, 305, 315) destinés à former un distributeur (7 ; 207) dans le carton formé à partir de la découpe, les éléments de distributeur comprenant un panneau de distributeur (101, 103 ; 301, 303) au moins partiellement défini par une ligne de déchirure (105, 115 ; 305, 315) s'étendant au moins dans un panneau (31, 35 ; 231, 235) parmi la pluralité de panneaux, le panneau de distributeur étant au moins partiellement détachable du carton formé à partir de la découpe ;
et des éléments de poignée (75, 76, 77a, 77b, 79a, 79b, 83a, 83b, 85a, 85b, 87a, 87b, 89a, 89b, 91, 93a, 93b ; 275, 276, 277a, 277b, 279a, 279b, 283a, 283b, 285a, 285b, 287a, 287b, 289a, 289b, 291, 293a, 293b) destinés à former une poignée (11 ; 211) dans le carton formé à partir de la découpe, les éléments de poignée s'étendant au moins dans le panneau de distributeur, au moins une partie des éléments de poignée étant détachable du carton formé à partir de la découpe avec le panneau de distributeur,

caractérisée en ce que

la ligne de déchirure comprend une première partie directionnelle (161, 165 ; 361, 365) et une deuxième partie directionnelle (163, 167 ; 363, 367), une première extrémité de la première partie directionnelle étant adjacente à une deuxième extrémité de la deuxième partie directionnelle, la première partie directionnelle est configurée pour être déchirée vers la première extrémité de la première partie directionnelle, et la

deuxième partie directionnelle est configurée pour être déchirée vers la deuxième extrémité de la deuxième partie directionnelle.

9. Découpe selon la revendication 8, dans laquelle l'élément de poignée comprend une prise de poignée (77a, 77b ; 277a, 277b) s'étendant au moins dans le panneau de distributeur, la première extrémité de la première partie directionnelle et la deuxième extrémité de la deuxième partie directionnelle étant généralement alignées avec la prise de poignée.

10. Découpe selon la revendication 8, dans laquelle :

la ligne de déchirure comprend une série de fentes (106) et d'entailles (108), chaque fente comprenant une partie principale (110) généralement dirigée le long du contour de la ligne de déchirure et une partie oblique (114) oblique par rapport à la partie principale ;
la partie oblique est plus proche de la première extrémité de la première partie directionnelle de la ligne de déchirure que la partie principale respective pour chaque fente dans la première partie directionnelle ; et
la partie oblique est plus proche de la deuxième extrémité de la deuxième partie directionnelle de la ligne de déchirure que la partie principale respective pour chaque fente dans la deuxième partie directionnelle.

11. Découpe selon la revendication 8, dans laquelle l'élément de poignée comprend un panneau de poignée (75, 76 ; 275, 276) comportant une prise de poignée (77a, 77b ; 277a, 277b) s'étendant au moins dans le panneau de distributeur, au moins une partie de la prise de poignée étant détachable du carton formé à partir de la découpe avec le panneau de distributeur, la poignée comprend en outre une ouverture de poignée (79a, 79b ; 279a, 279b), la prise de poignée s'étendant à côté de l'ouverture de poignée.

12. Découpe selon la revendication 8, dans laquelle :

l'au moins un panneau comprend une ligne de coupe (93a, 93b ; 293a, 293b) s'étendant à partir d'un coin de l'au moins un panneau vers la poignée ; et
la ligne de déchirure comprend une série de fentes (106) et d'entailles (108) et un espacement (160 ; 360) entre deux des fentes, l'espacement étant aligné avec la ligne de coupe.

13. Procédé d'ouverture d'un carton (5 ; 205), le procédé comprenant :

l'obtention d'un carton (5 ; 205) comprenant une pluralité de panneaux (17, 21, 23, 31, 35 ; 217, 221, 223, 231, 235) s'étendant au moins partiellement autour d'un intérieur du carton, un distributeur (7 ; 207) comprenant un panneau de distributeur (101, 103, 125 ; 301, 303, 325), et une poignée (11 ; 211) permettant de saisir et de porter le carton, le panneau de distributeur étant au moins partiellement défini par une ligne de déchirure (105, 115 ; 305, 315) s'étendant au moins dans un panneau (31, 35 ; 231, 235) parmi la pluralité de panneaux, et la poignée comprenant un élément de poignée (75, 76, 77a, 77b, 79a, 79b, 83a, 83b, 85a, 85b, 87a, 87b, 89a, 89b, 91, 93a, 93b ; 275, 276, 277a, 277b, 279a, 279b, 283a, 283b, 285a, 285b, 287a, 287b, 289a, 289b, 291, 293a, 293b) s'étendant au moins dans le panneau de distributeur ; le retrait au moins partiel du panneau de distributeur pour former une ouverture de distributeur (127 ; 327) dans le carton, l'ouverture de distributeur fournissant un accès à l'intérieur du carton, le retrait au moins partiel du panneau de distributeur comprend le retrait au moins partiel de l'élément de poignée dans le panneau de distributeur,

caractérisé en ce que

la ligne de déchirure comprend une première partie directionnelle (161, 165 ; 361, 365) et une deuxième partie directionnelle (163, 167 ; 363, 367), une première extrémité de la première partie directionnelle étant adjacente à une deuxième extrémité de la deuxième partie directionnelle, le retrait au moins partiel du panneau de distributeur comprenant le déchirement de la première partie directionnelle vers la première extrémité de la première partie directionnelle et le déchirement de la deuxième partie directionnelle vers la deuxième extrémité de la deuxième partie directionnelle.

14. Procédé selon la revendication 13, dans lequel l'élément de poignée comprend un panneau de poignée (75, 76 ; 275, 276) comportant une prise de poignée (77a, 77b ; 277a, 277b) s'étendant au moins dans le panneau de distributeur à côté d'une ouverture de poignée (79a, 79b ; 279a, 279b), au moins une partie de la prise de poignée étant détachable du carton avec le panneau de distributeur.

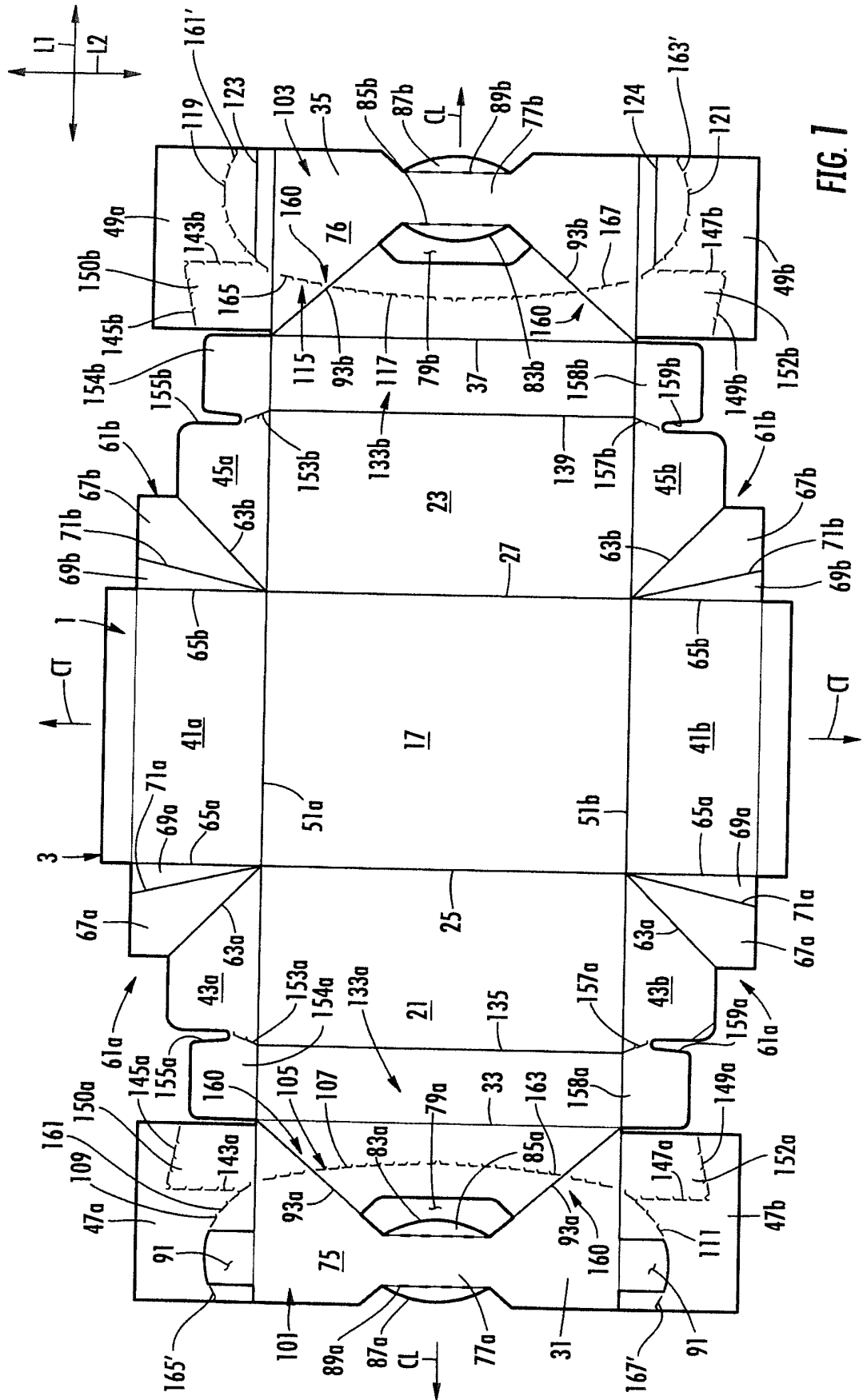


FIG. 1

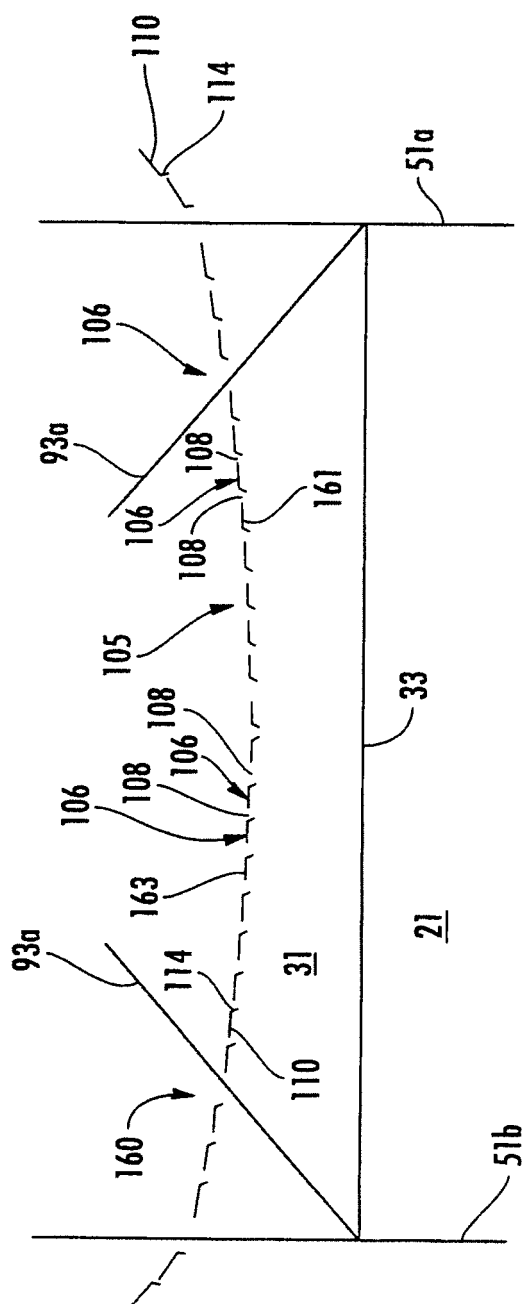


FIG. 1A

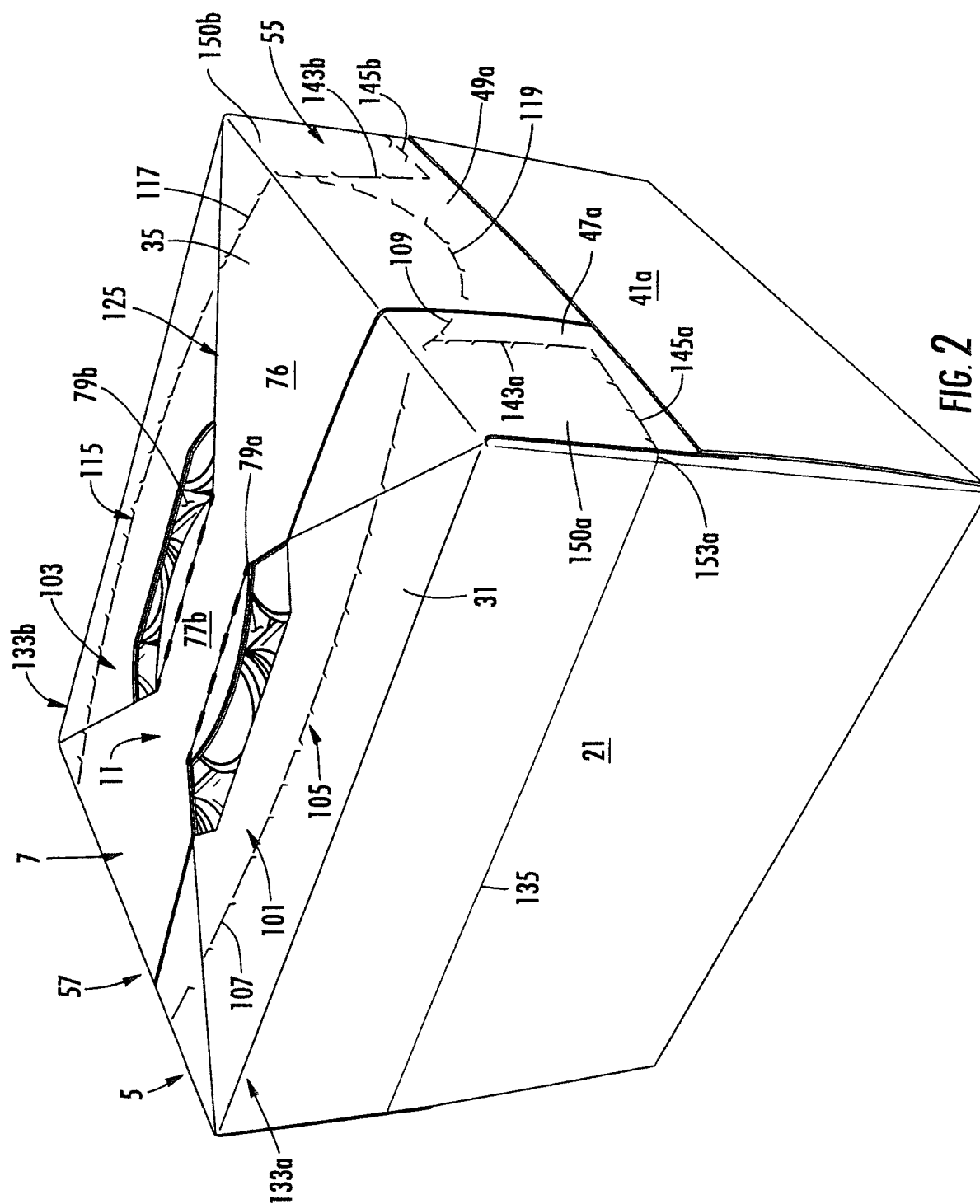


FIG. 2

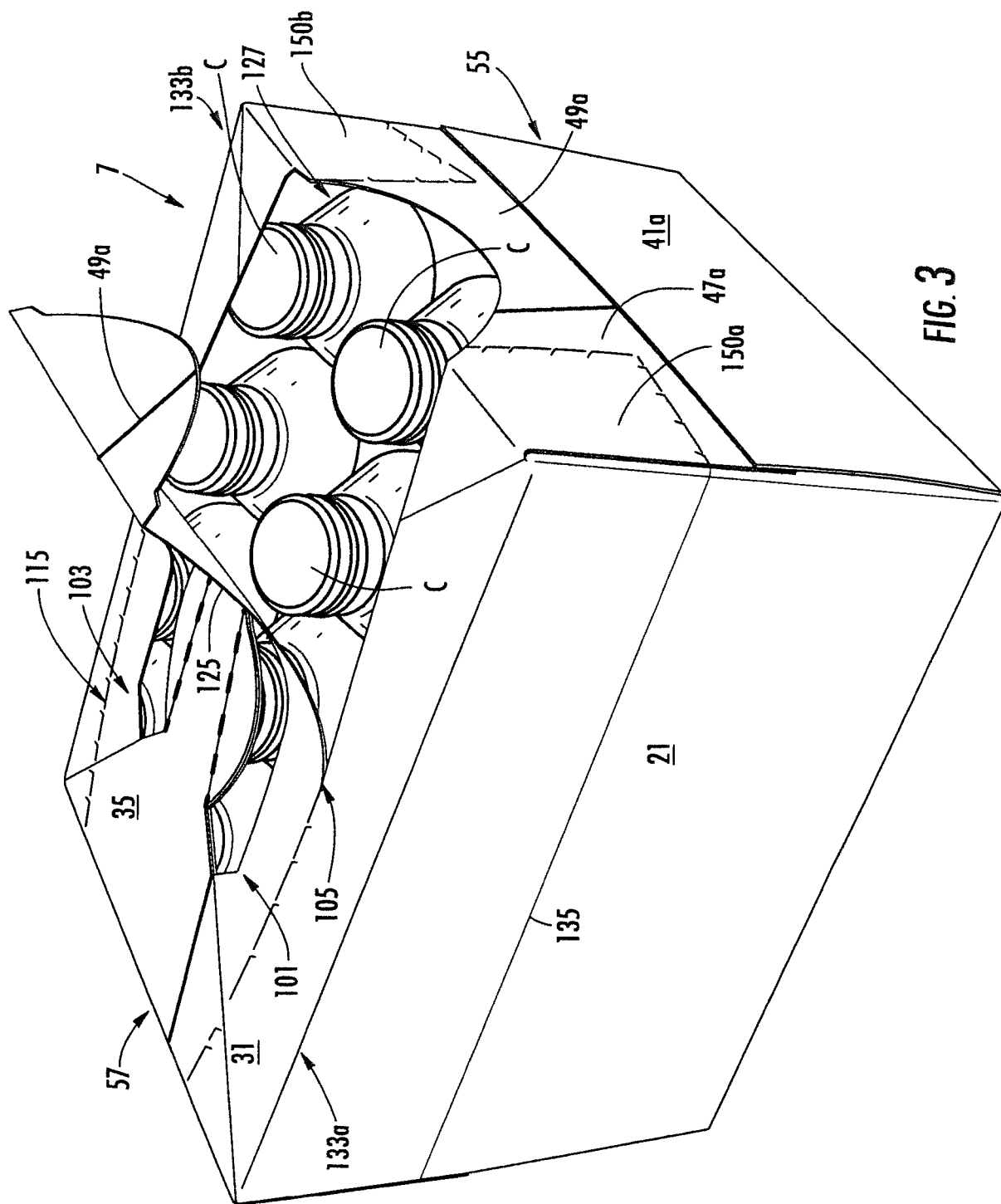
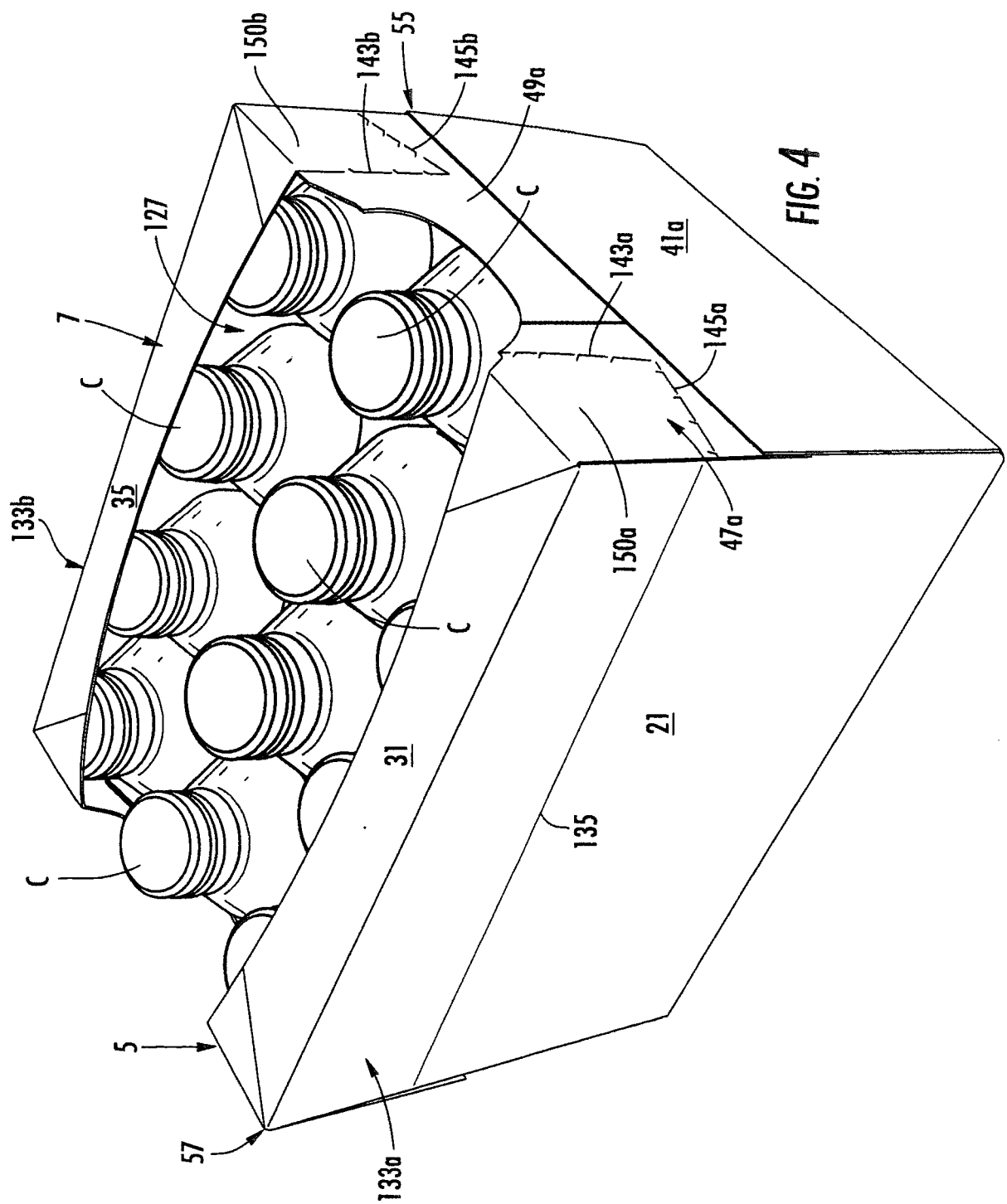
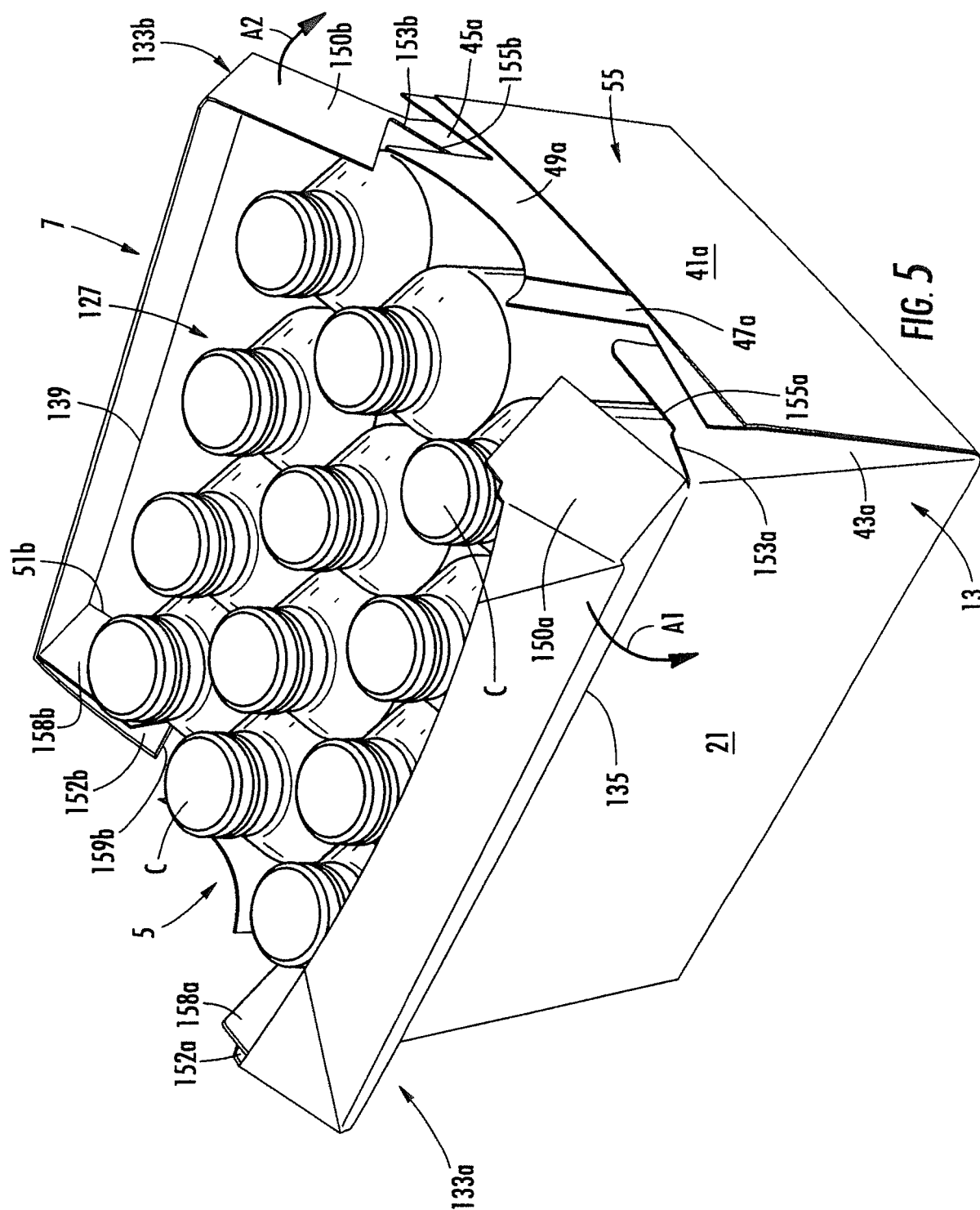
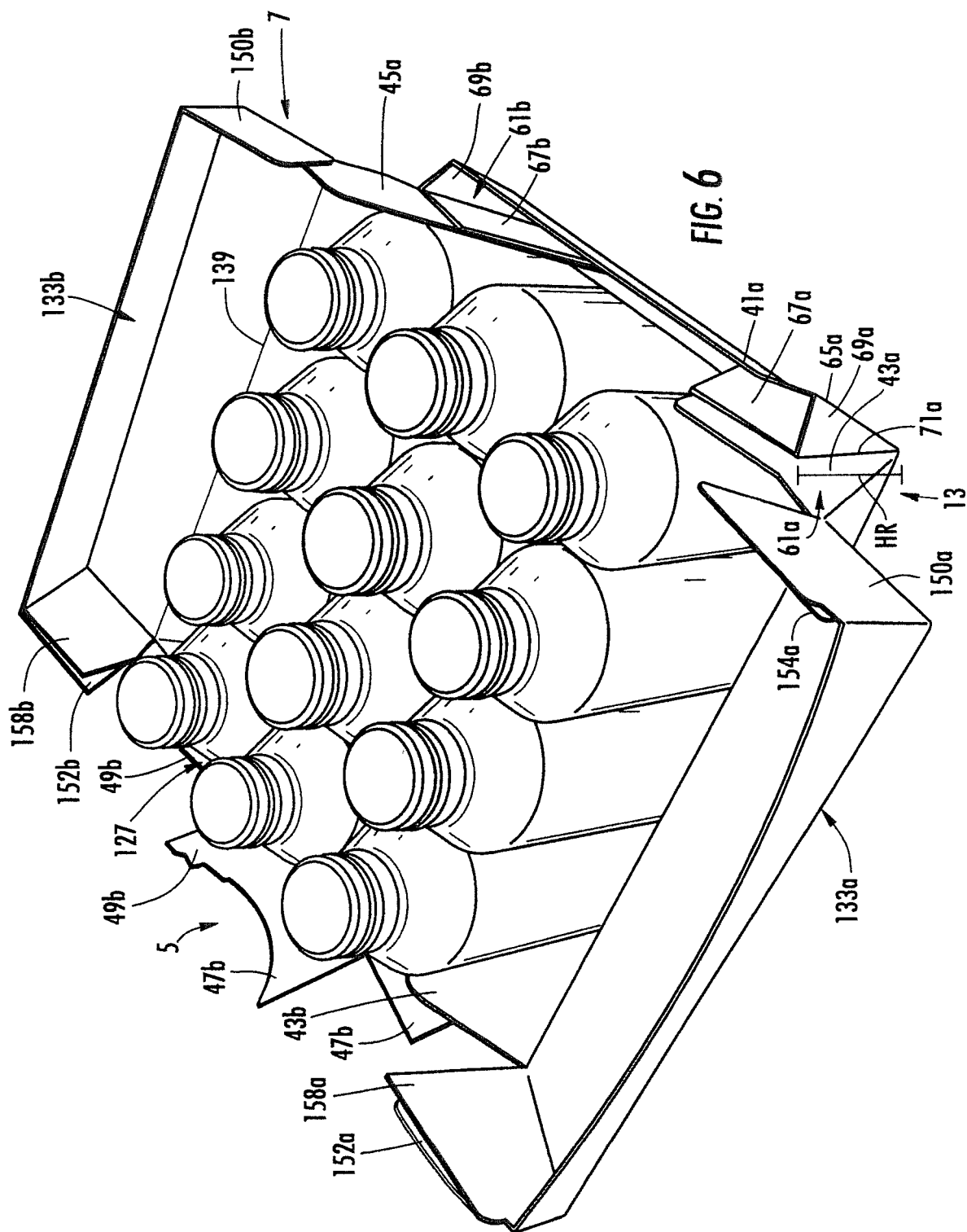


FIG. 3







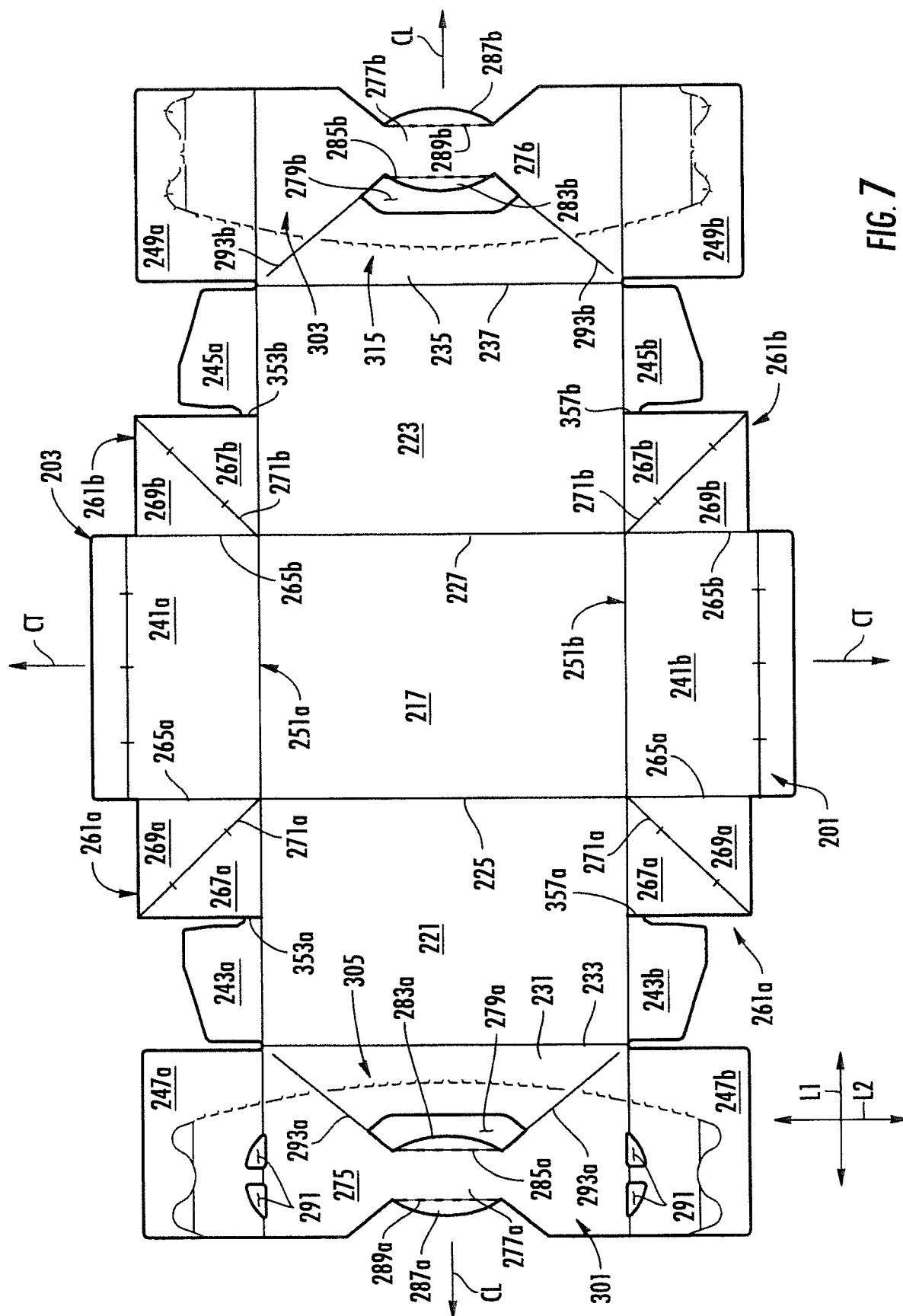


FIG. 7

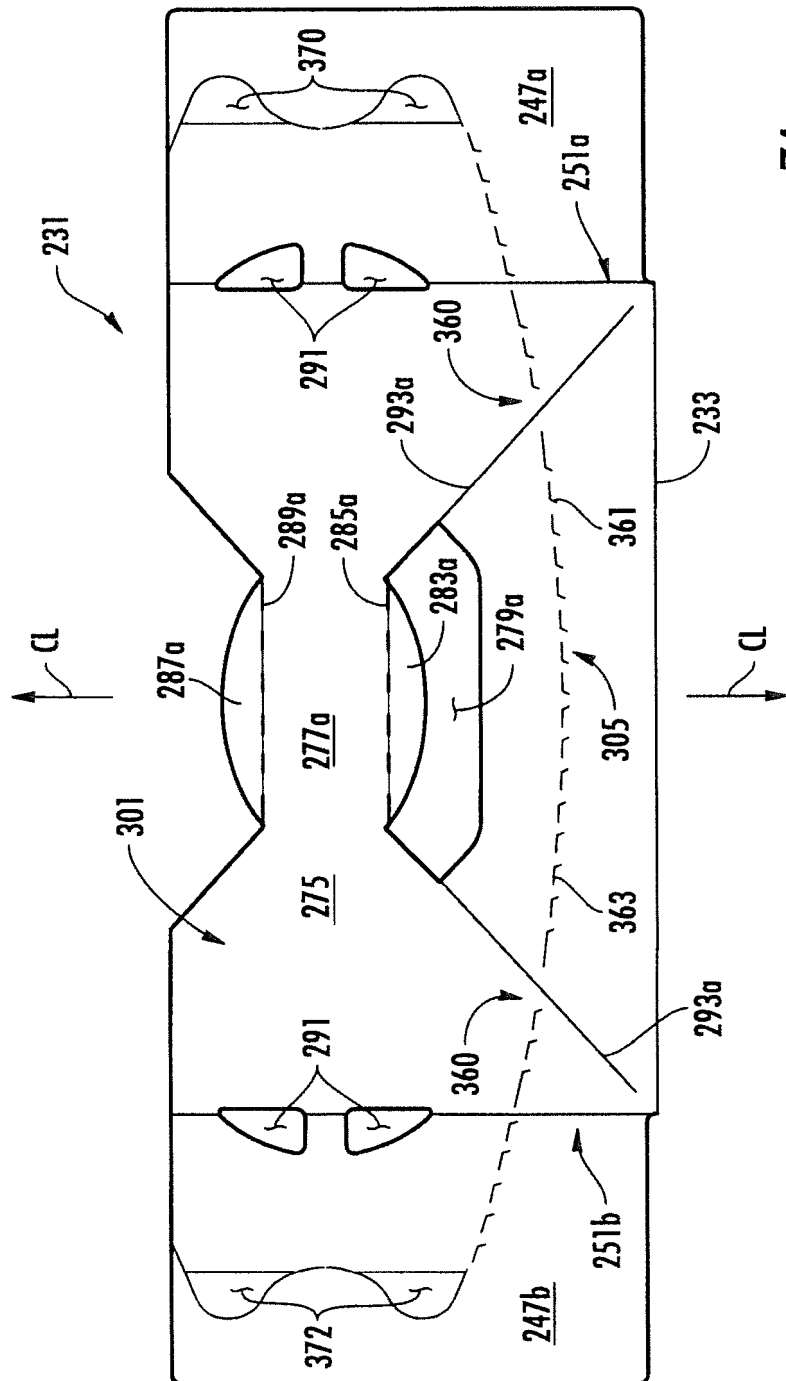


FIG. 7A

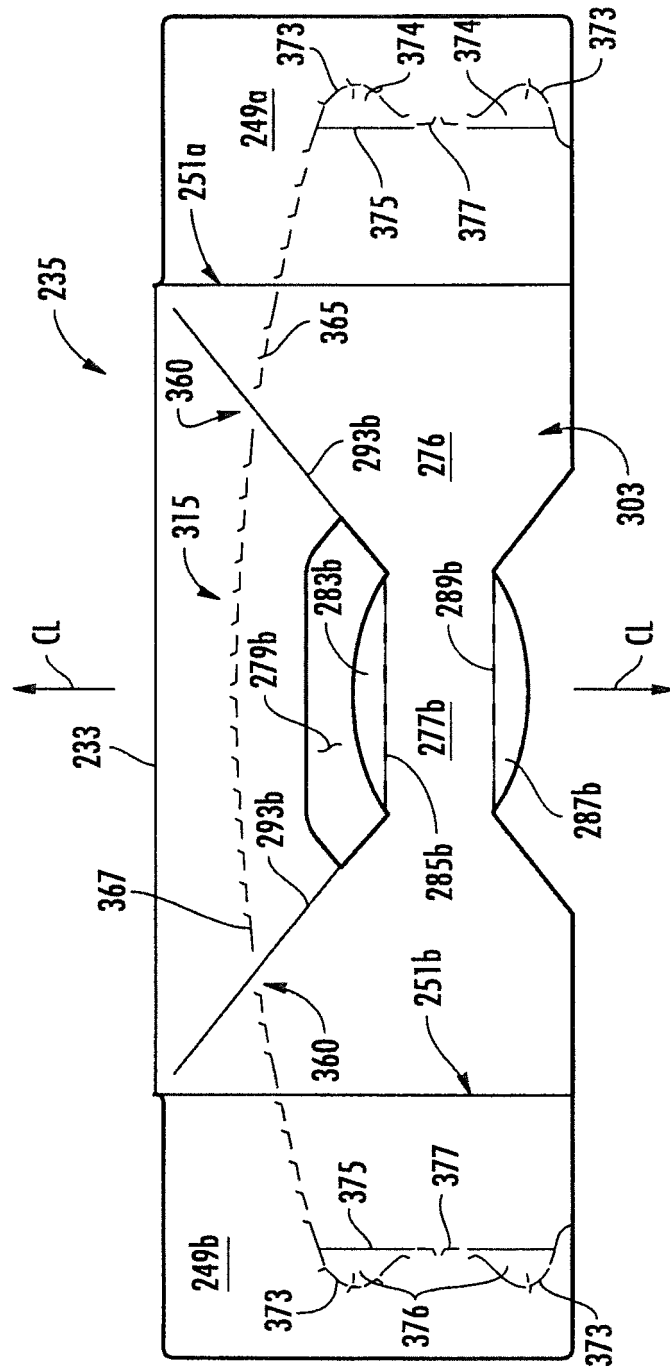


FIG. 7B

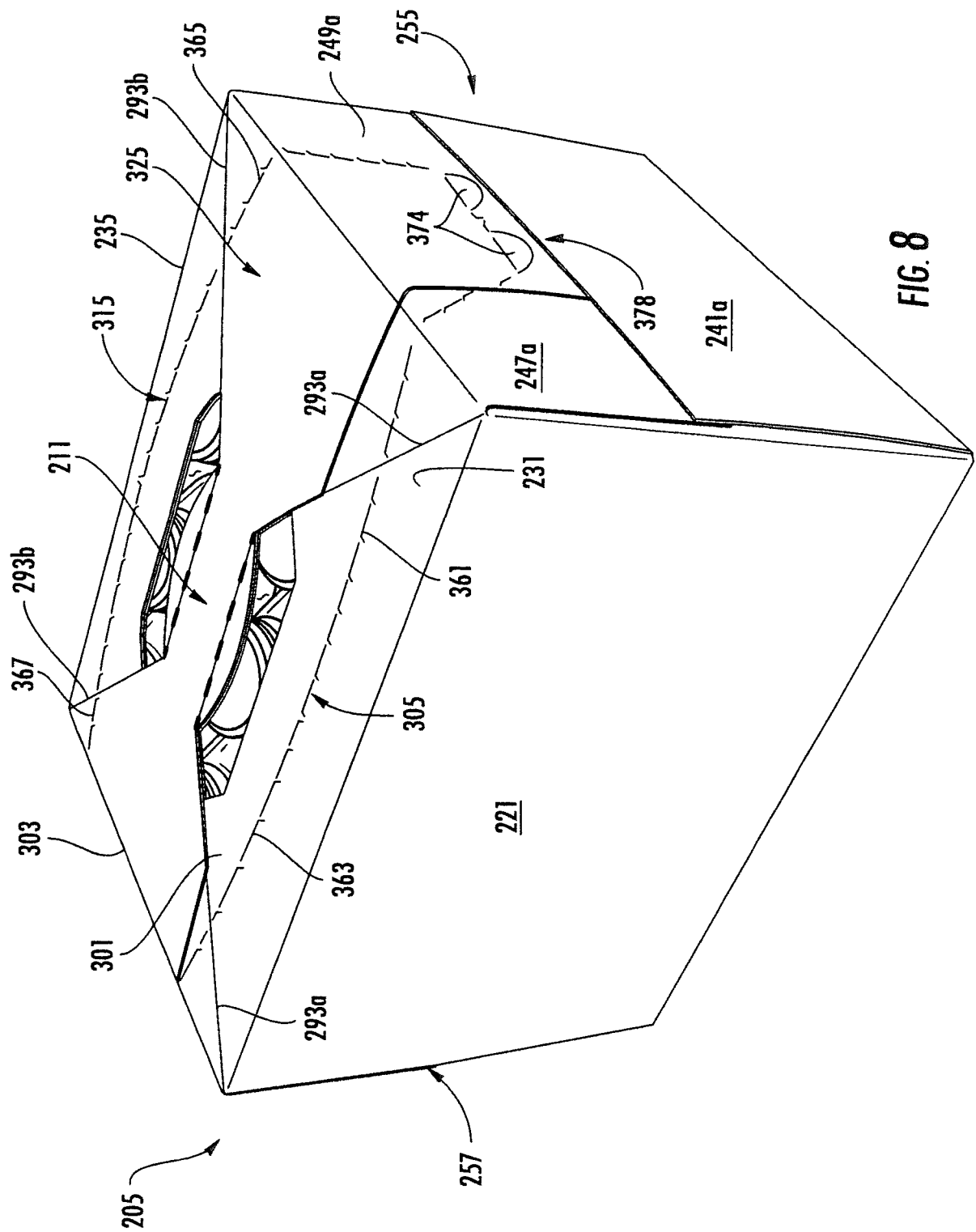
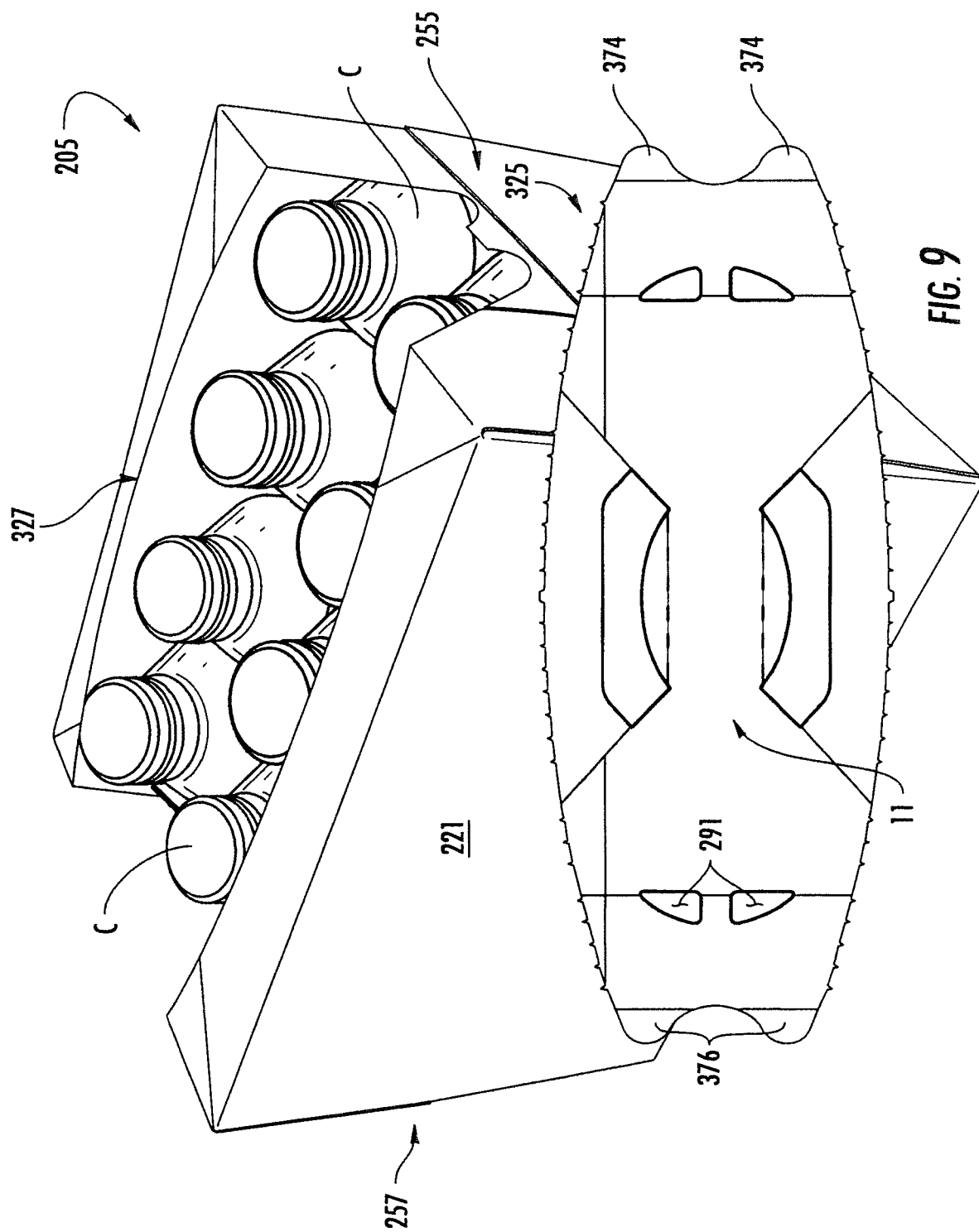
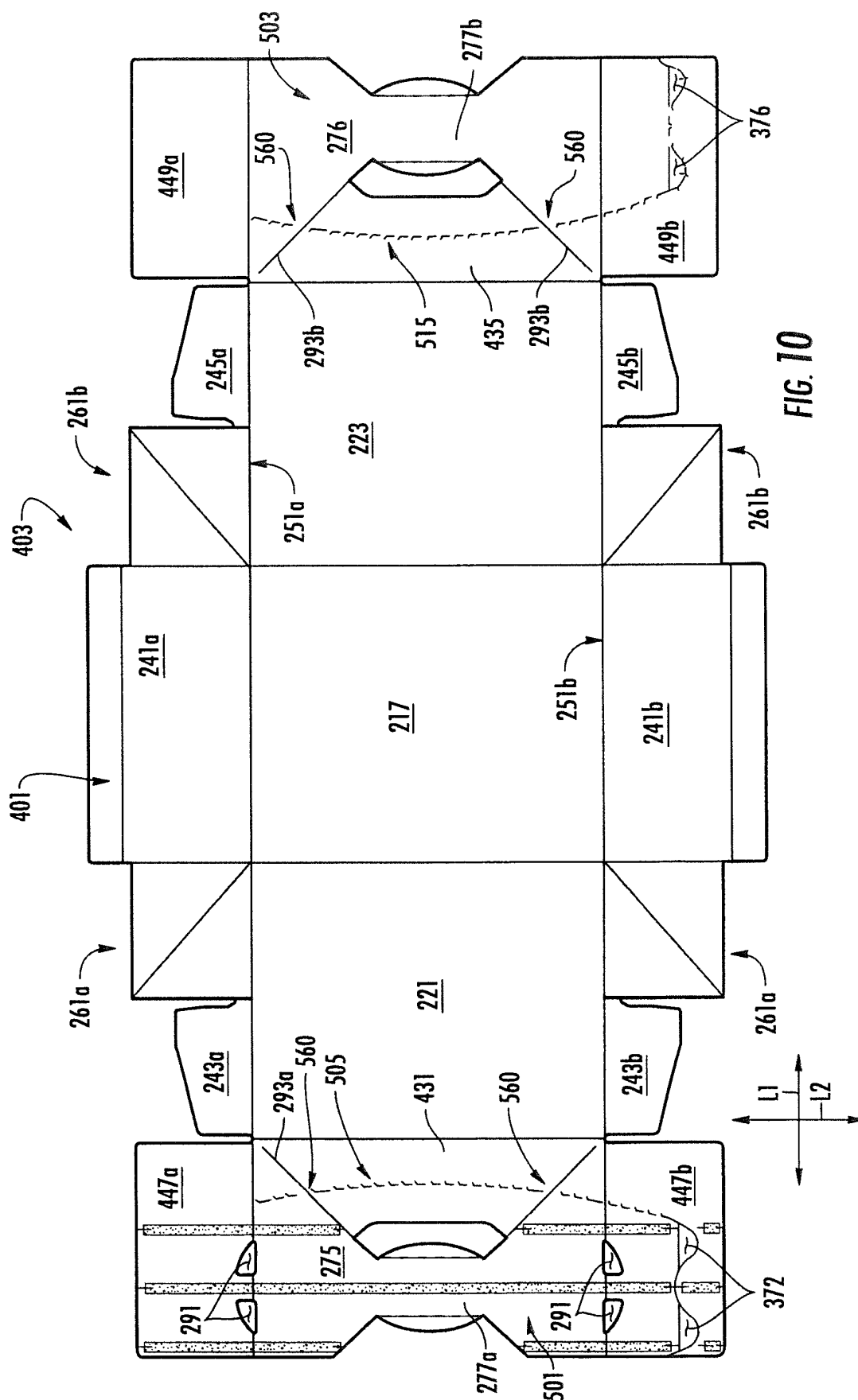


FIG. 8





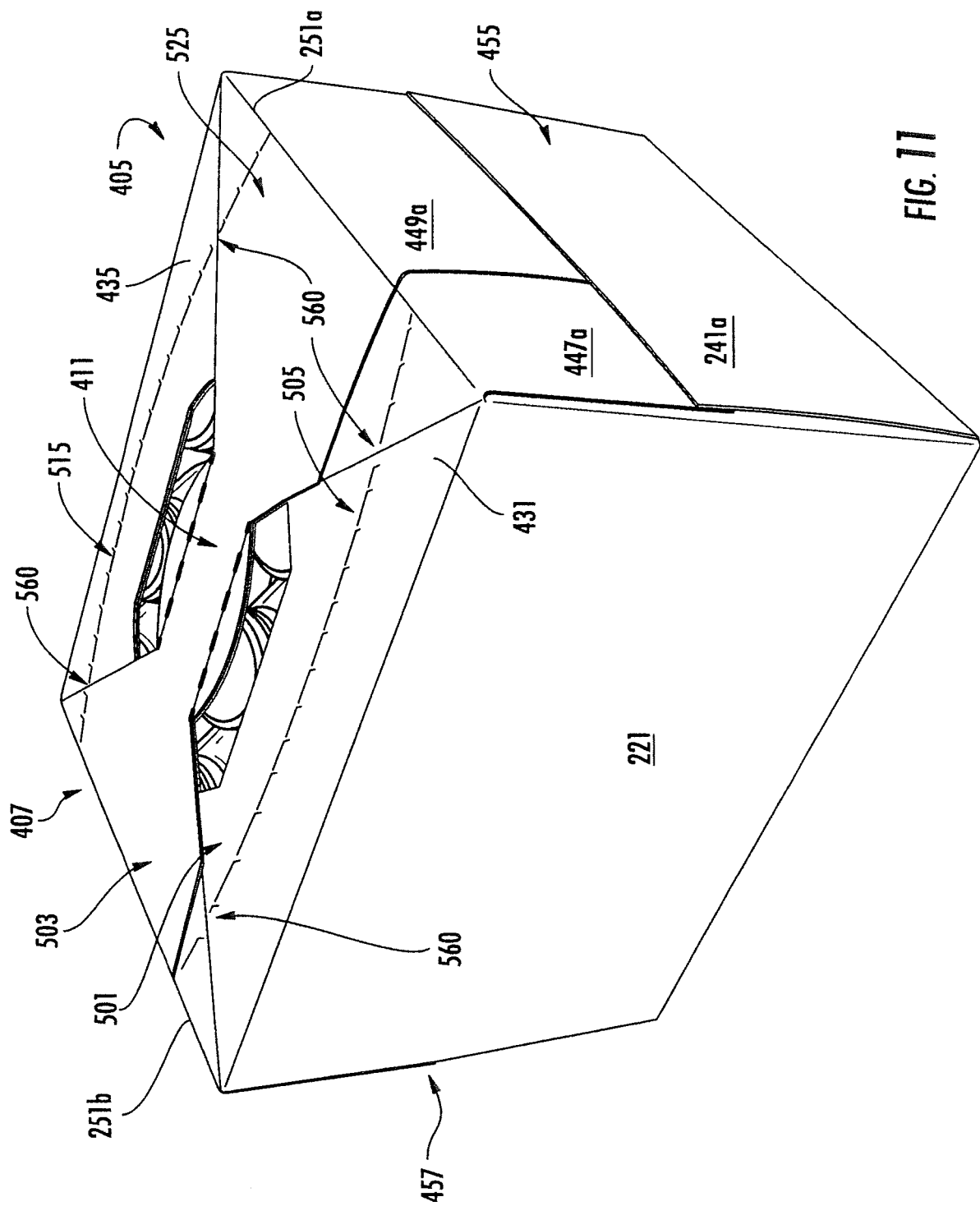
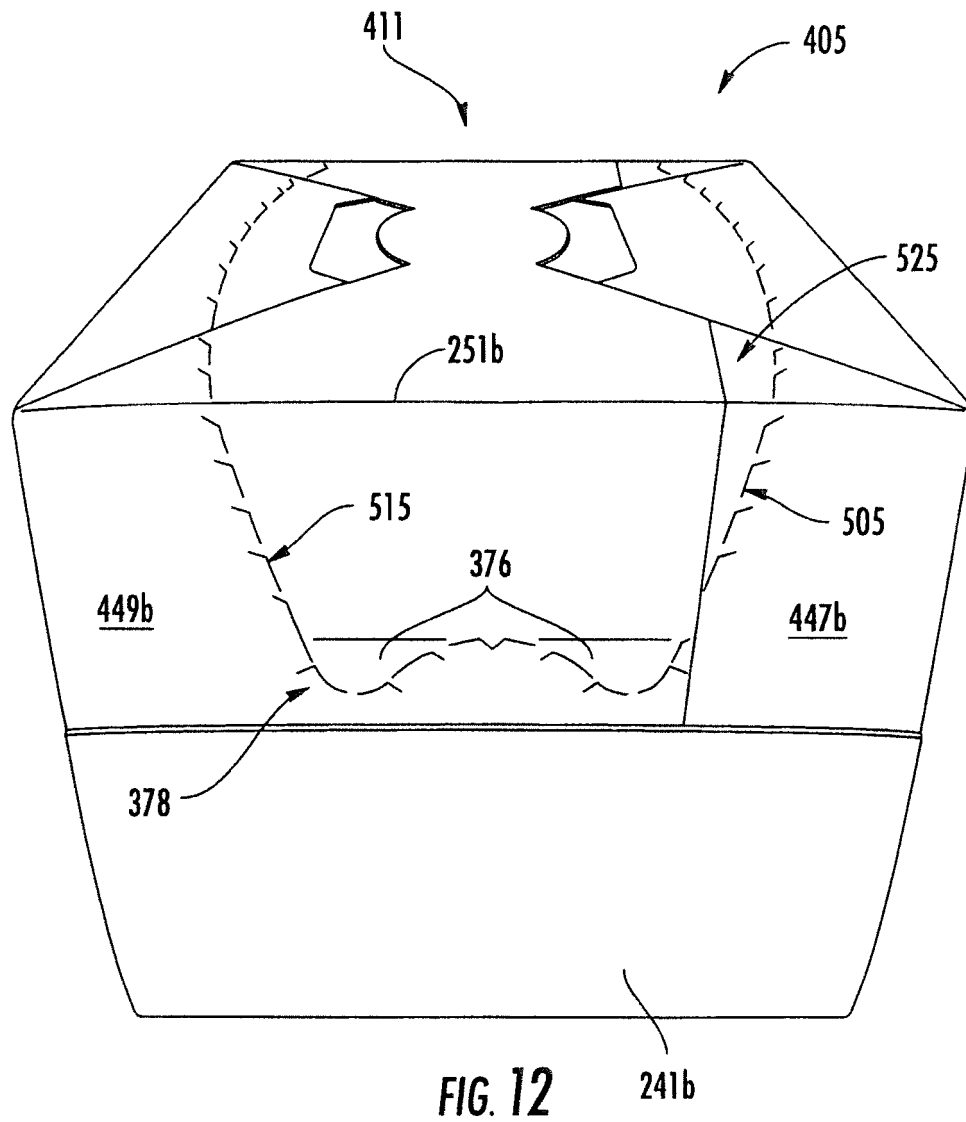
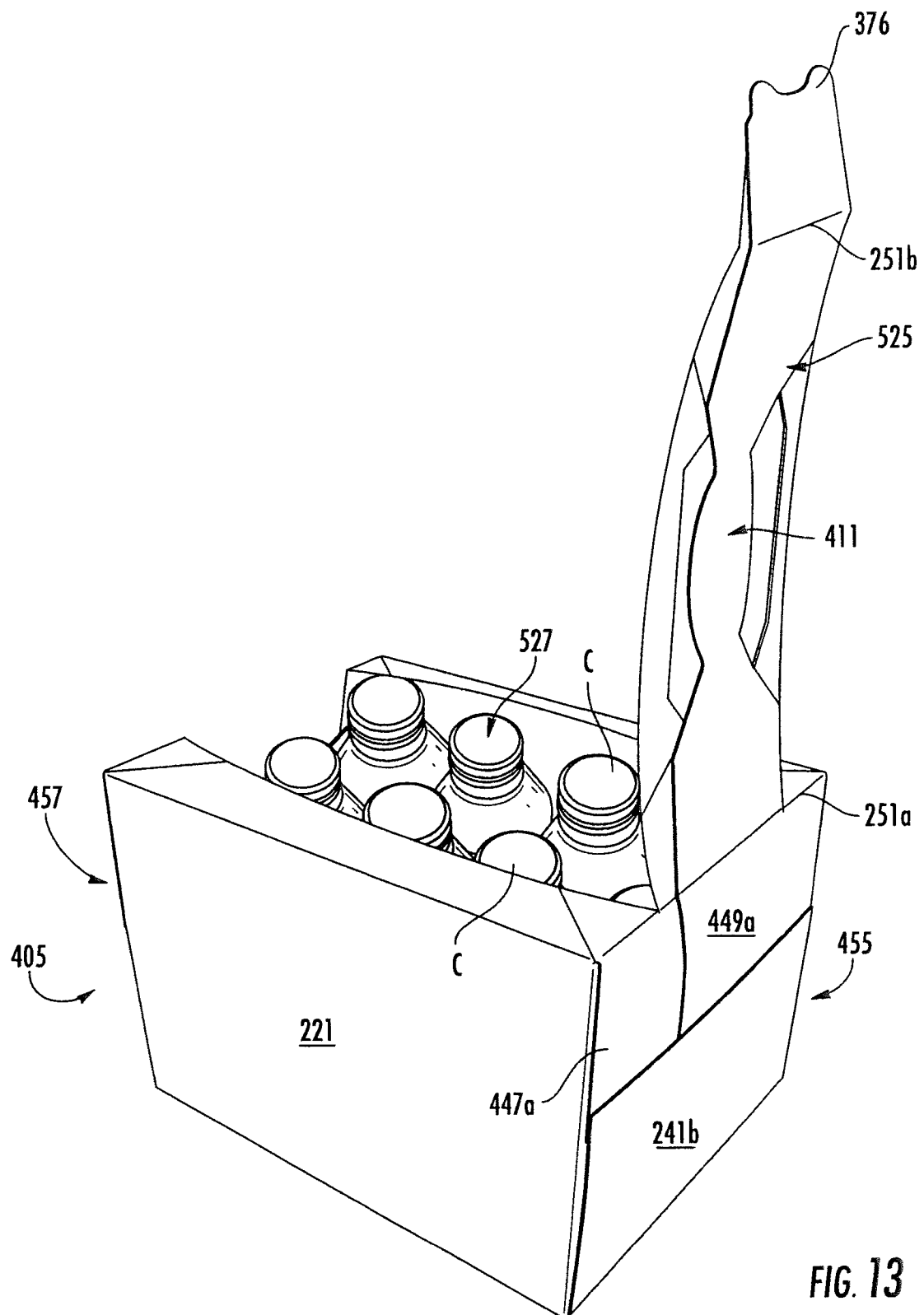
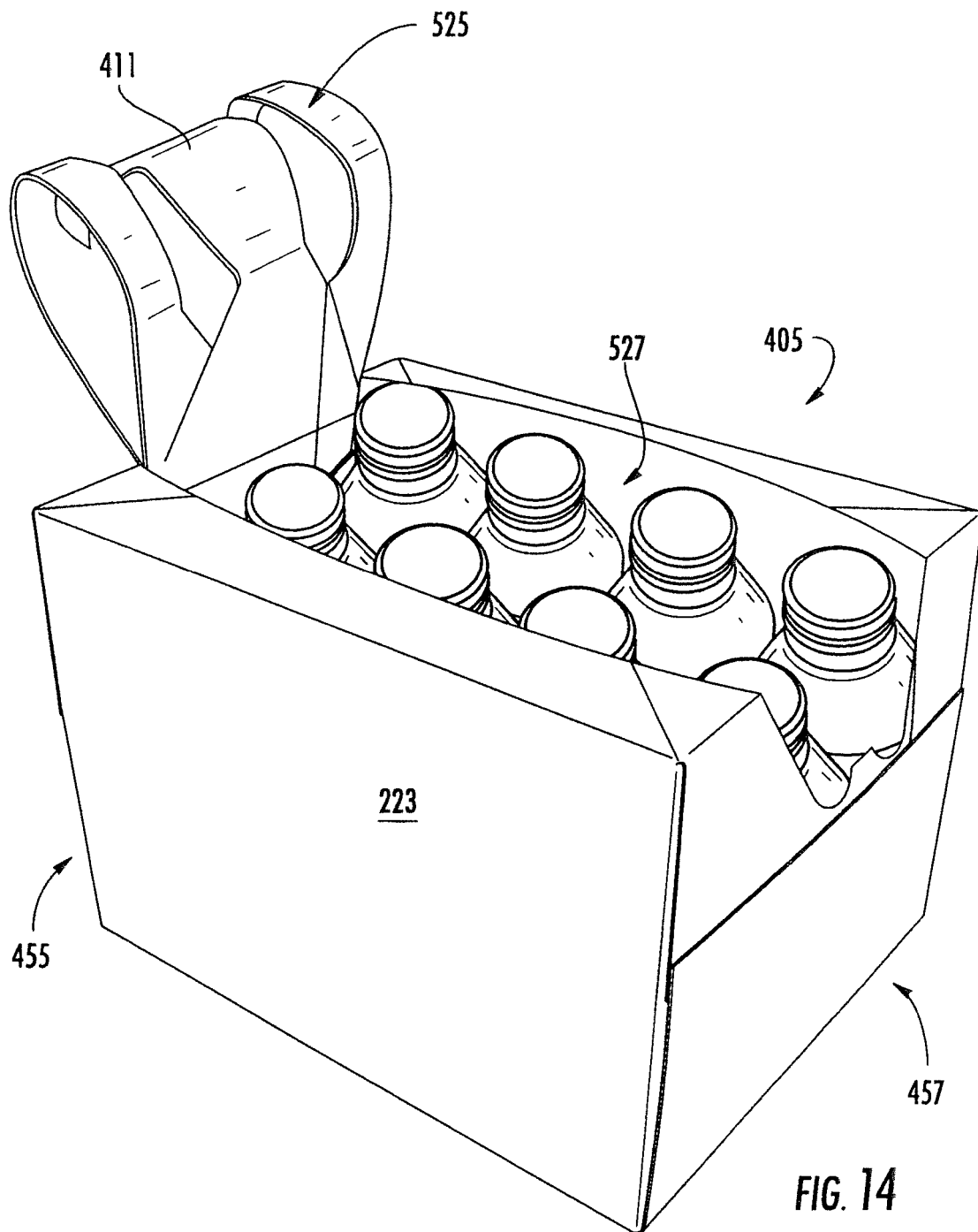


FIG. 11







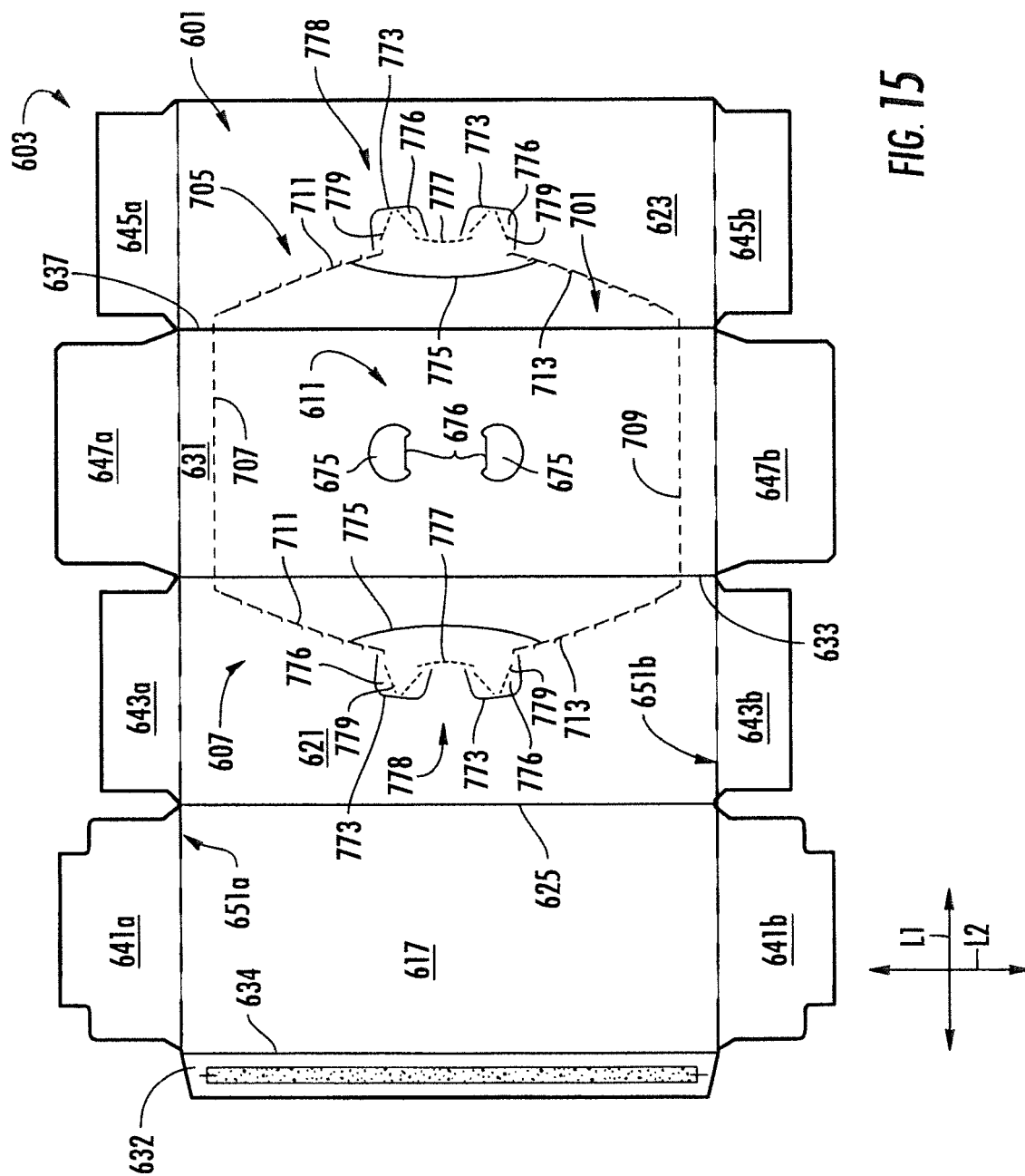


FIG. 15

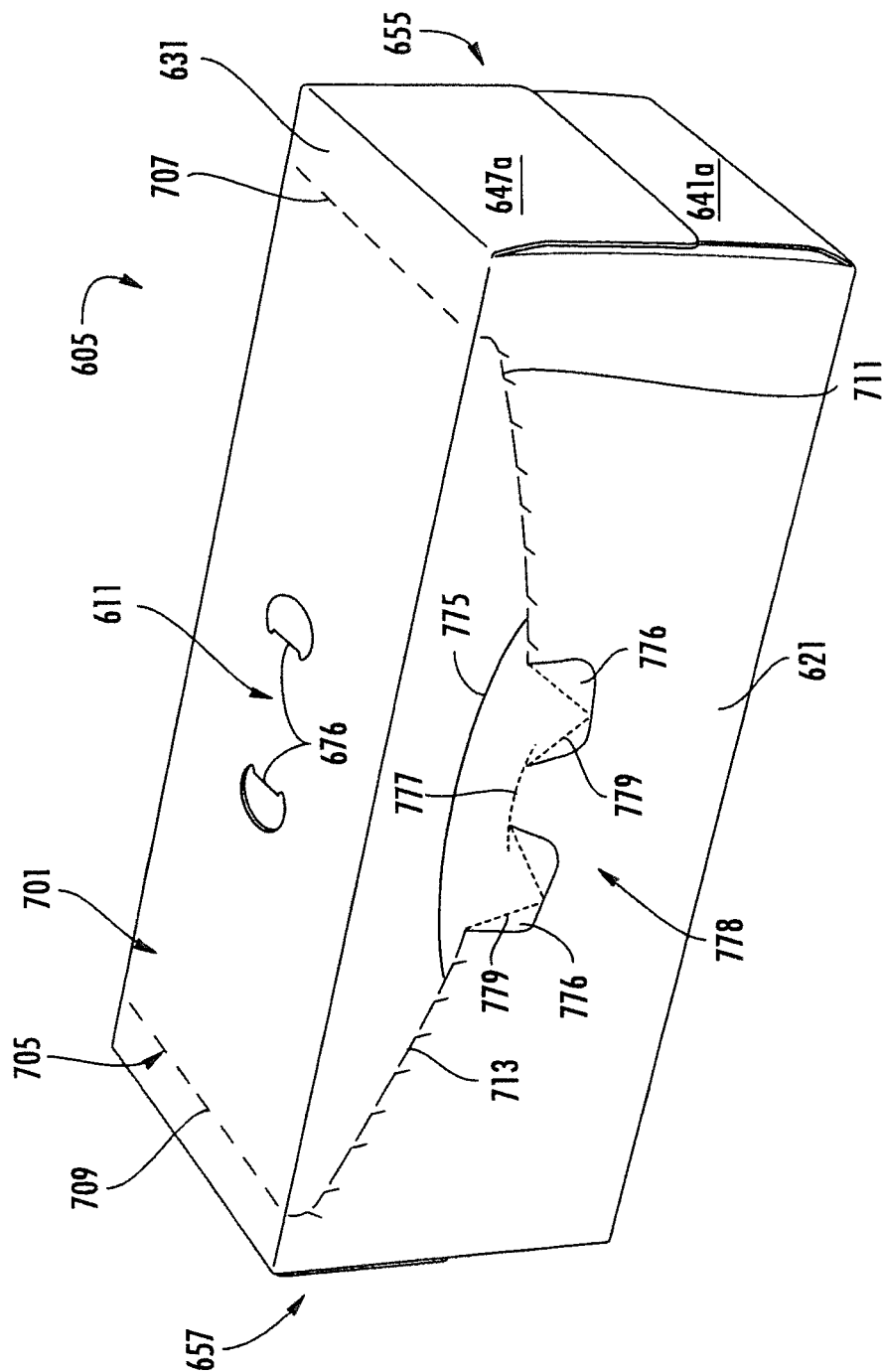


FIG. 16

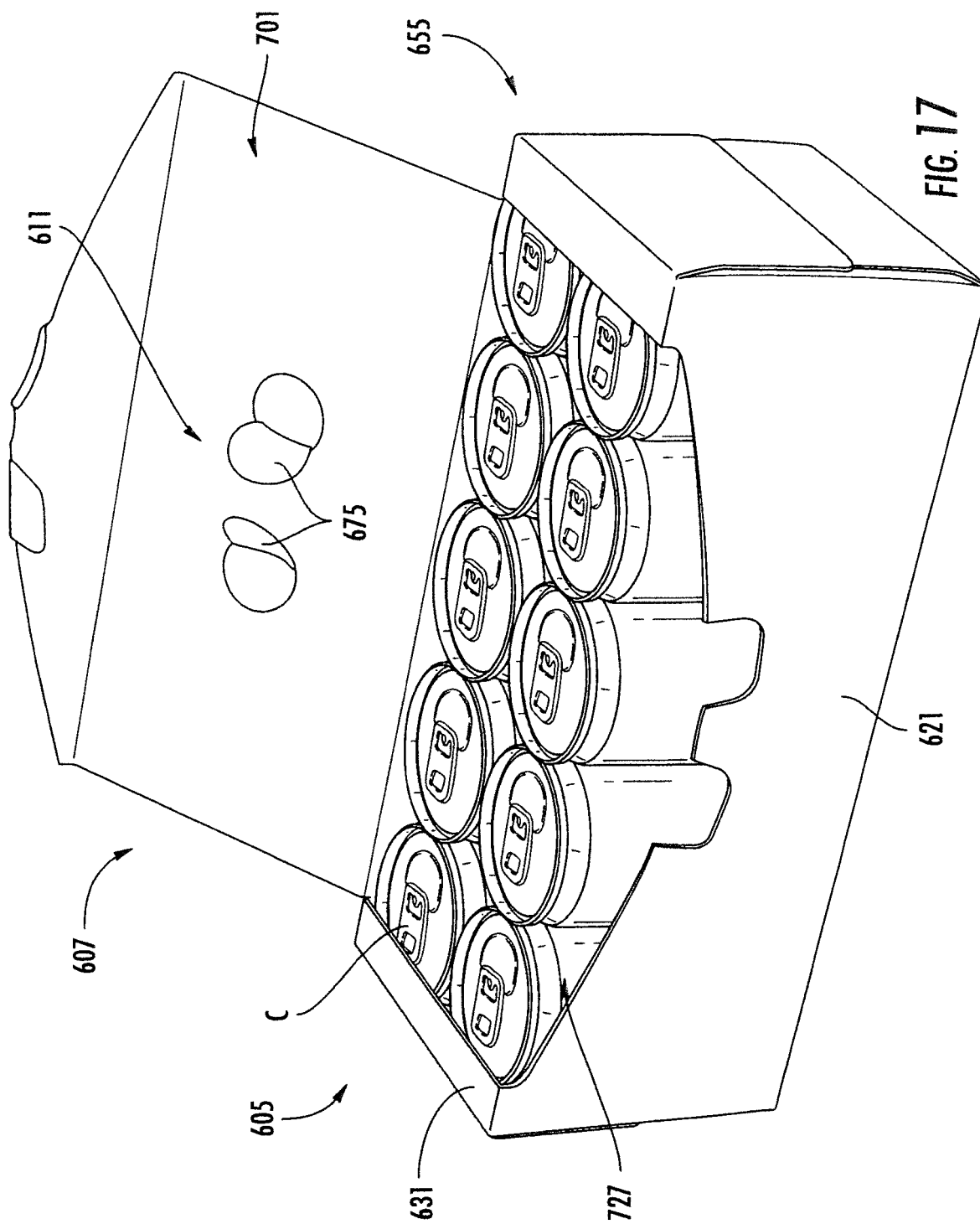


FIG. 17

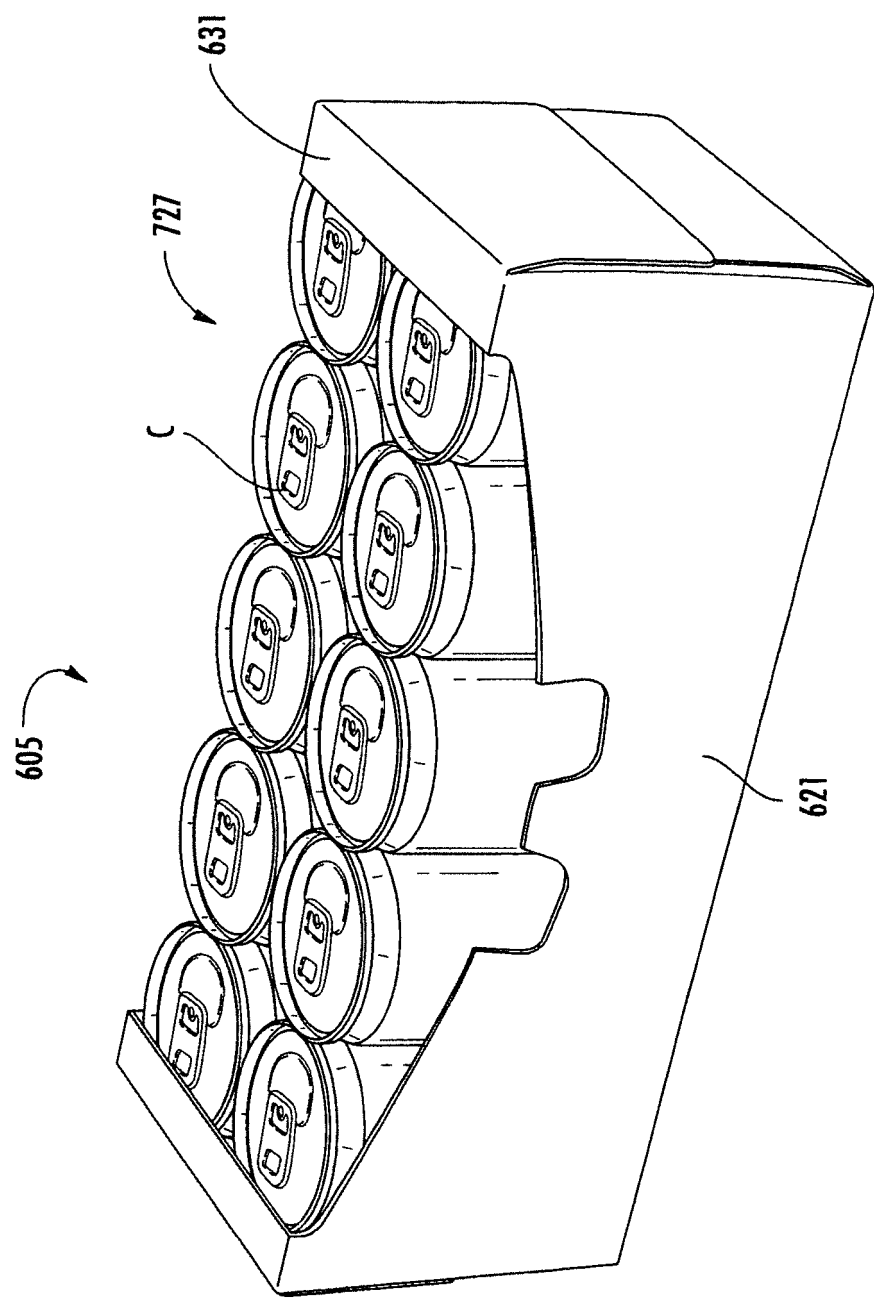
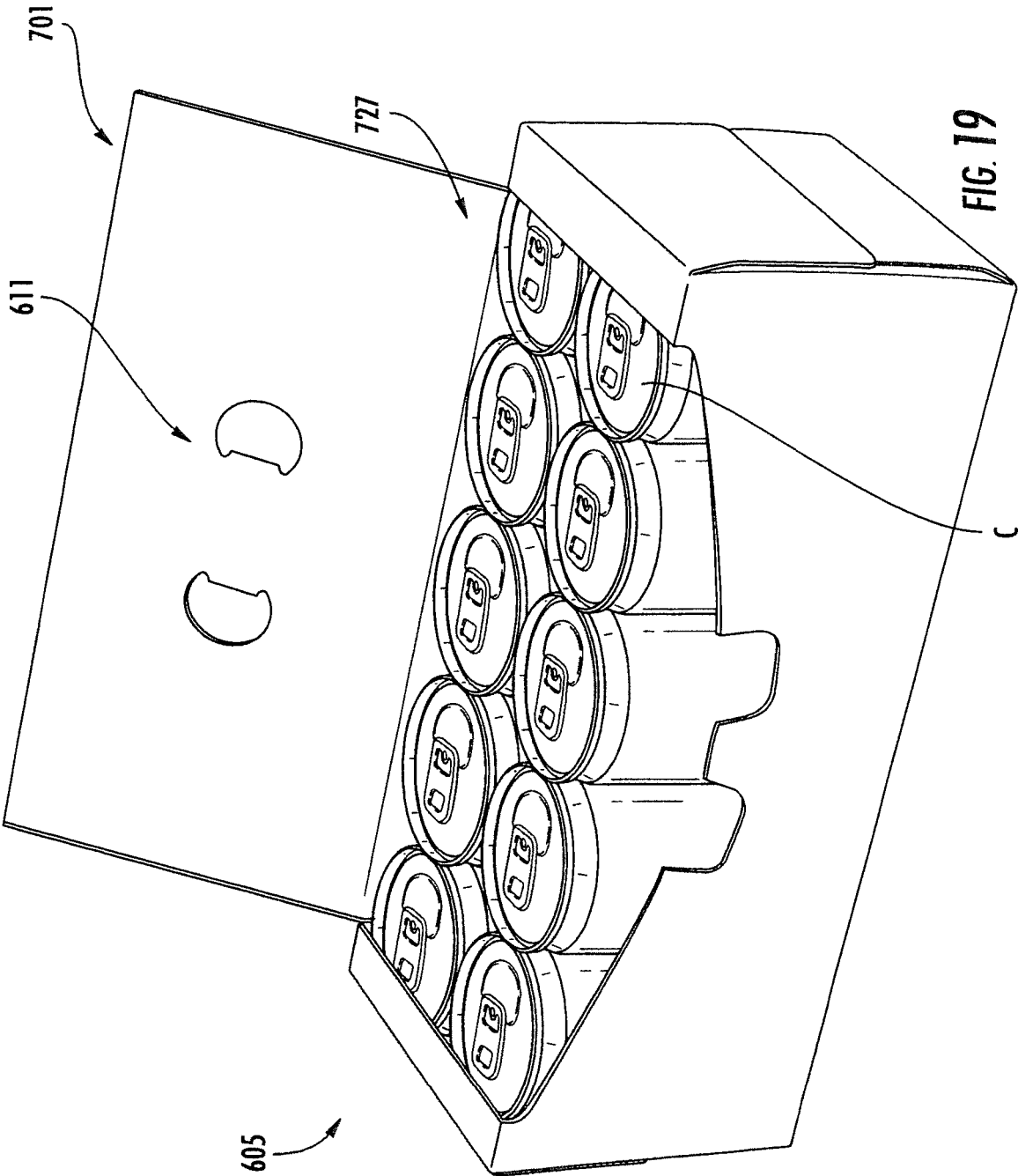
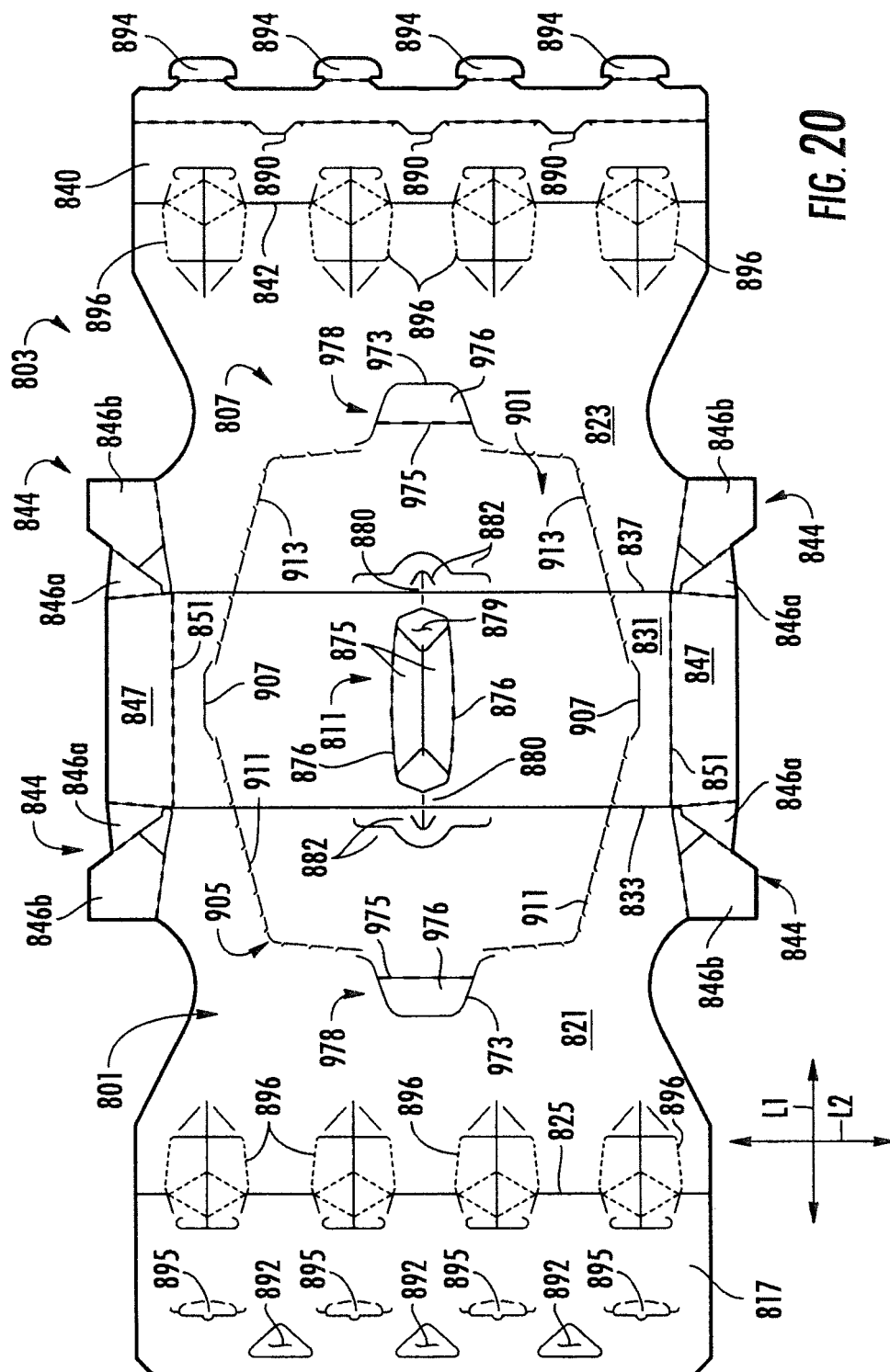


FIG. 18





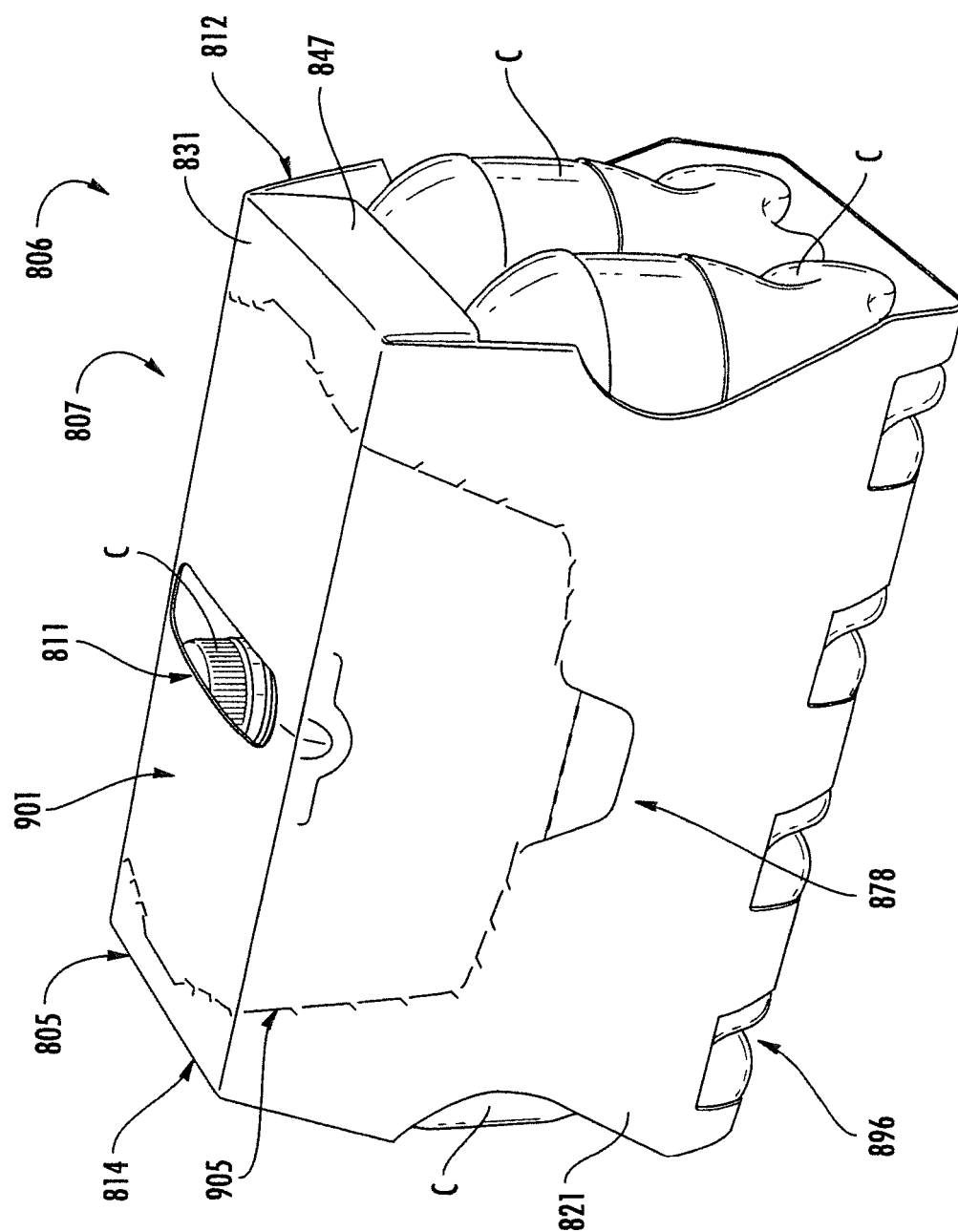


FIG. 21

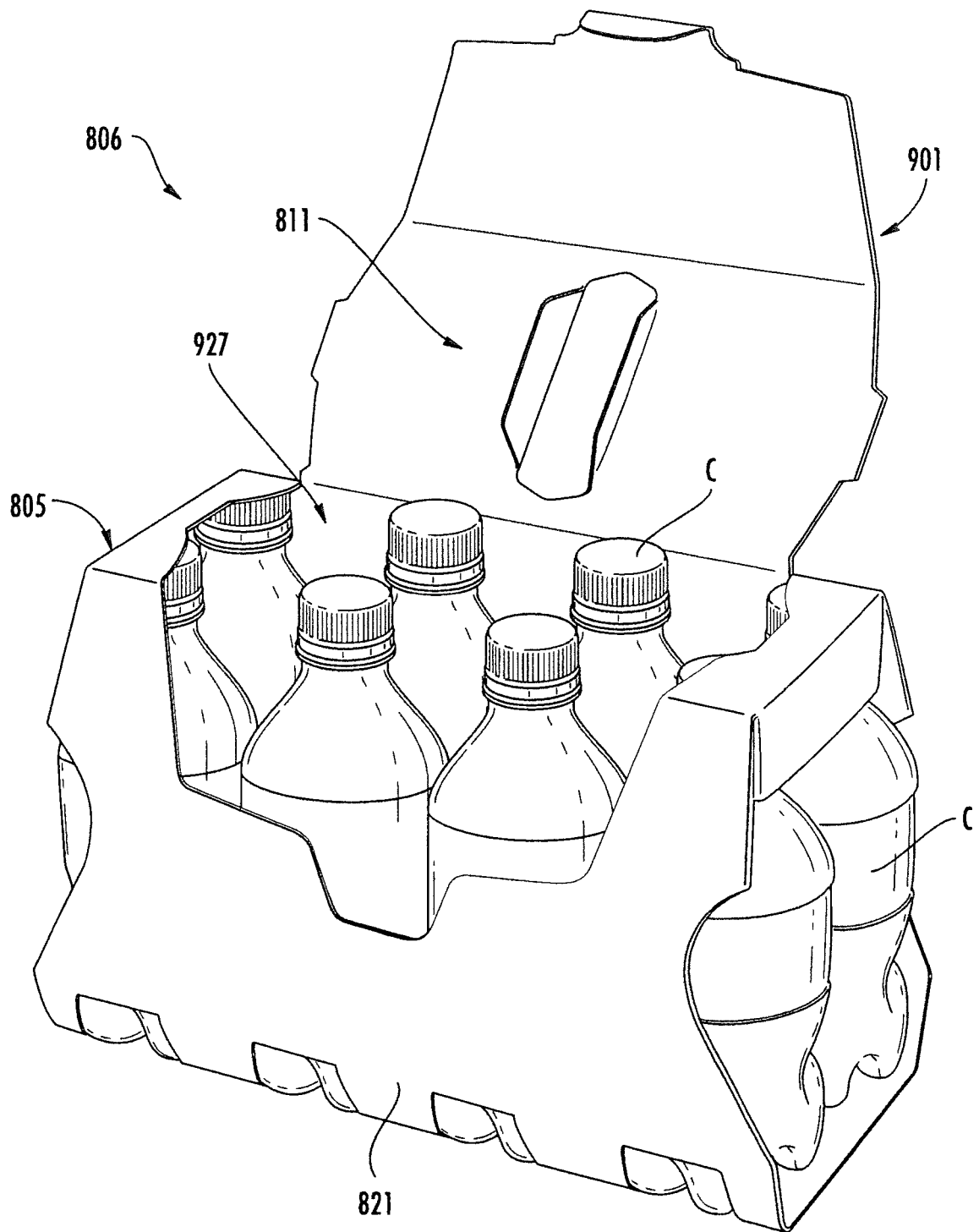


FIG. 22

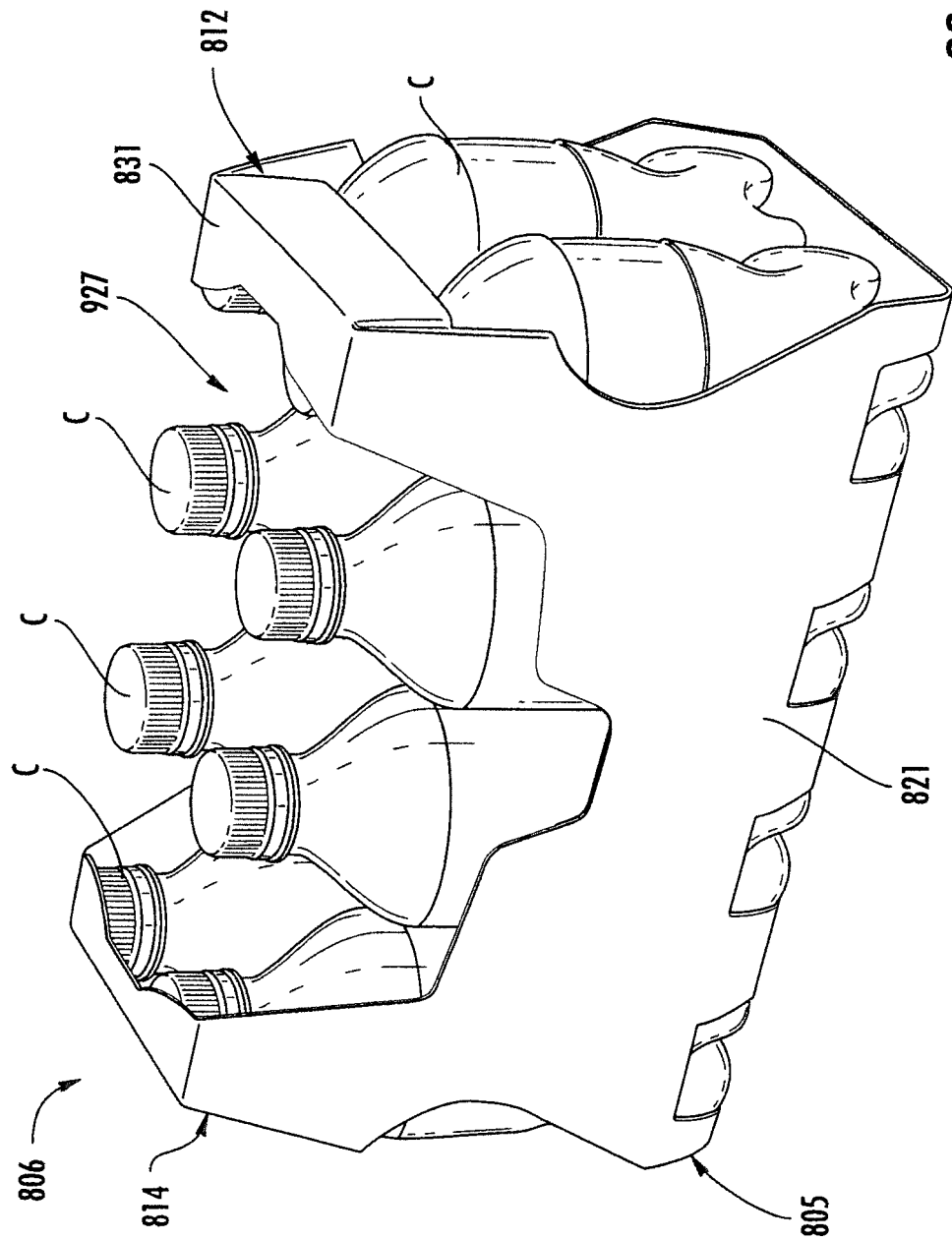


FIG. 23

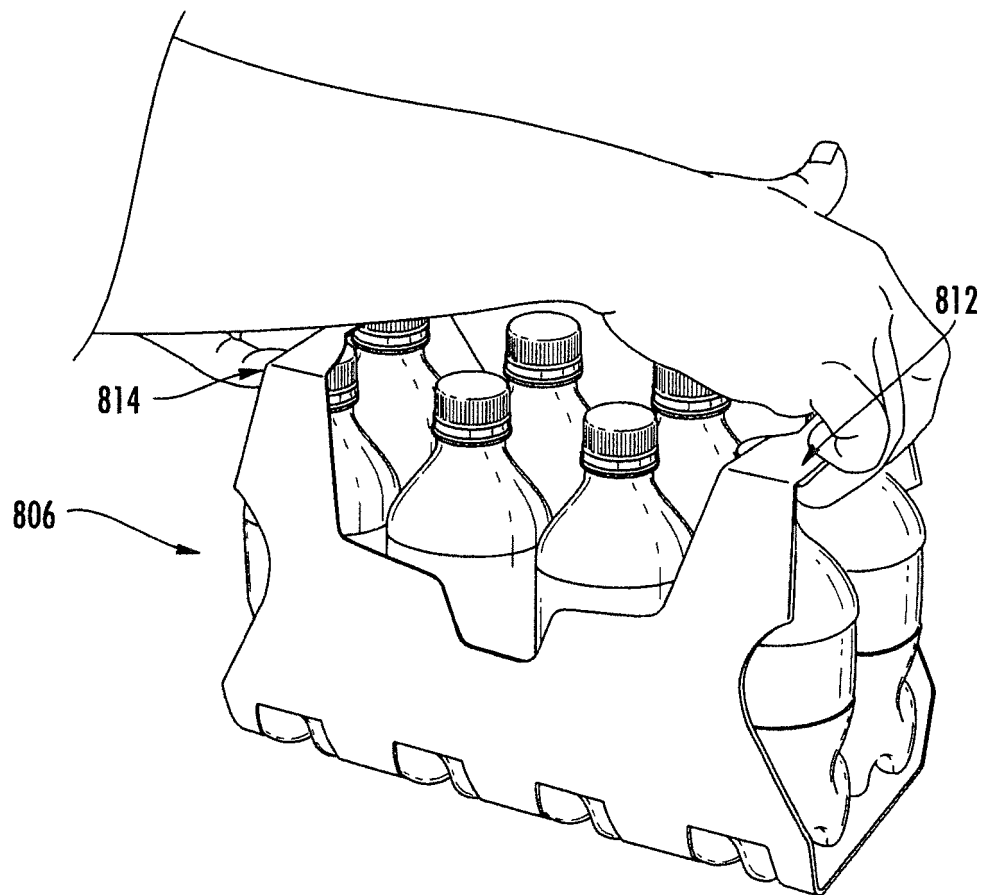
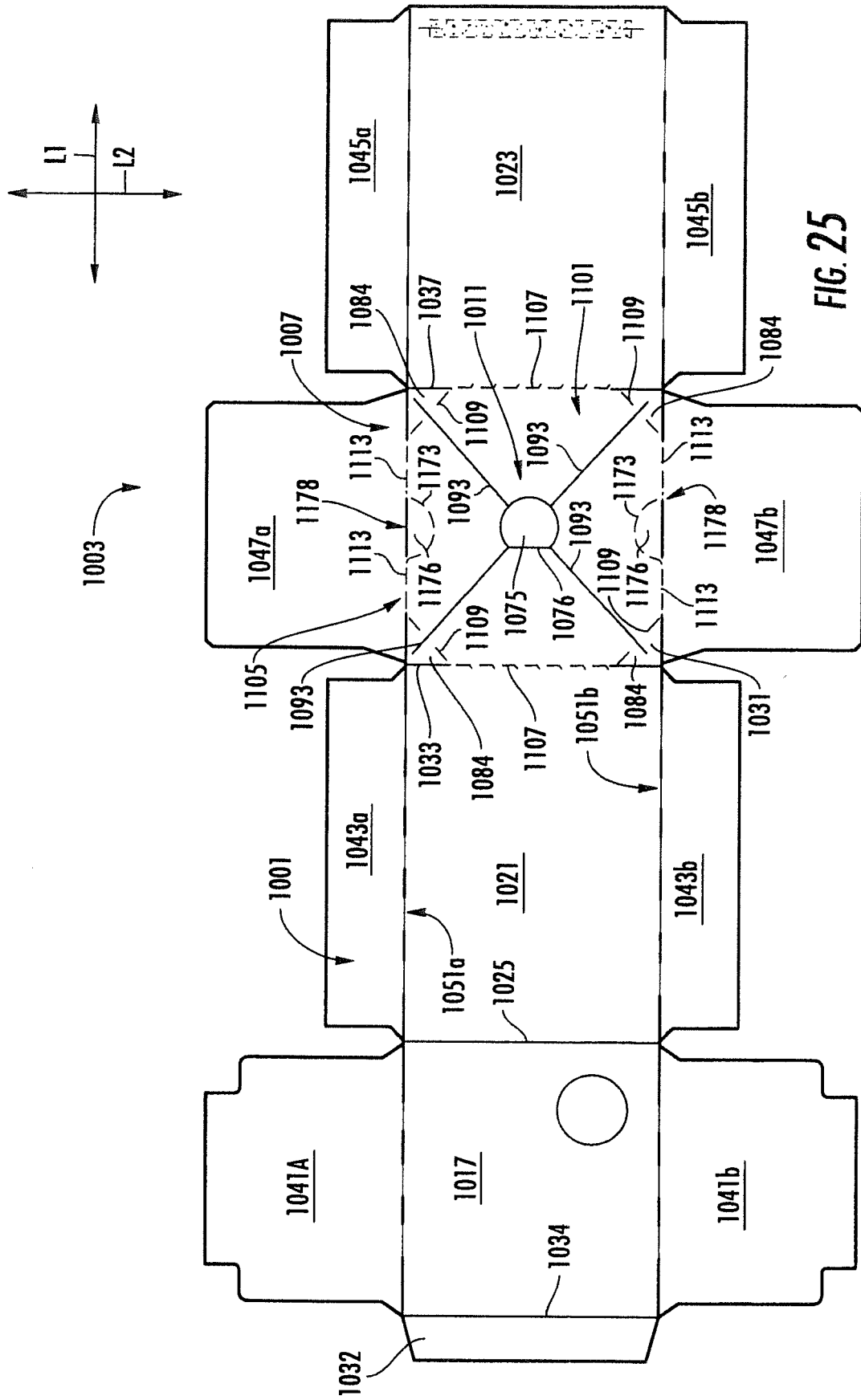


FIG. 24



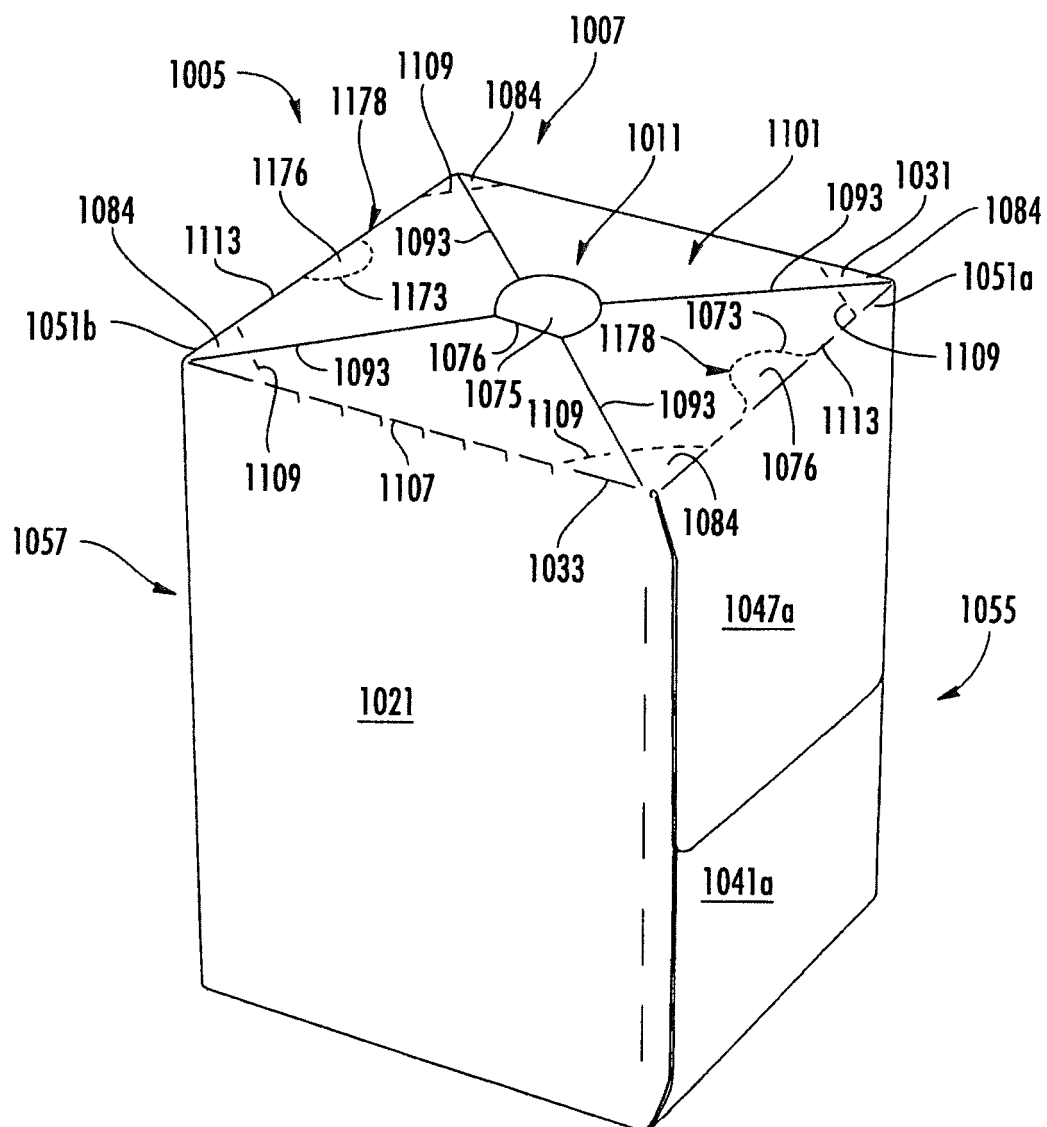
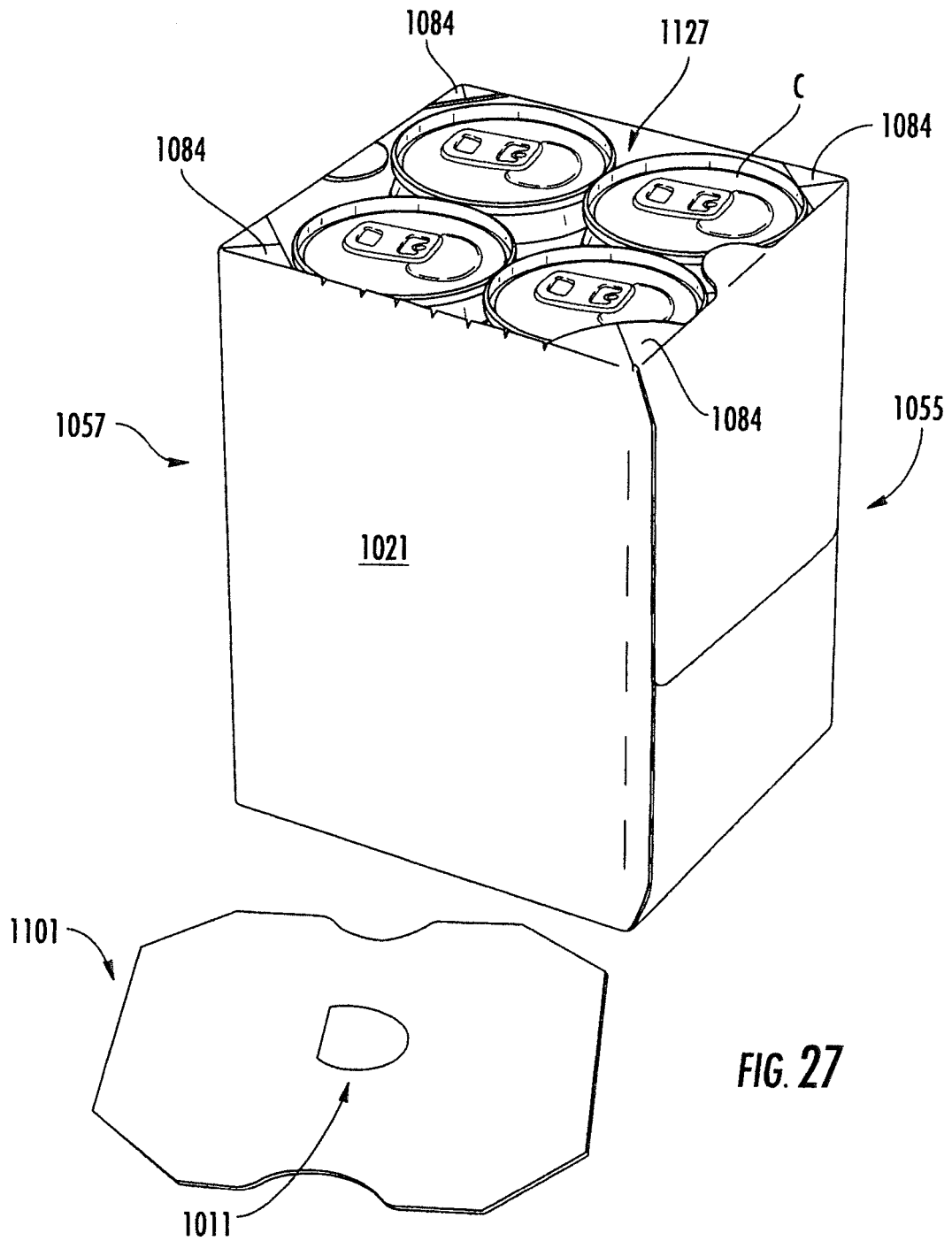


FIG. 26



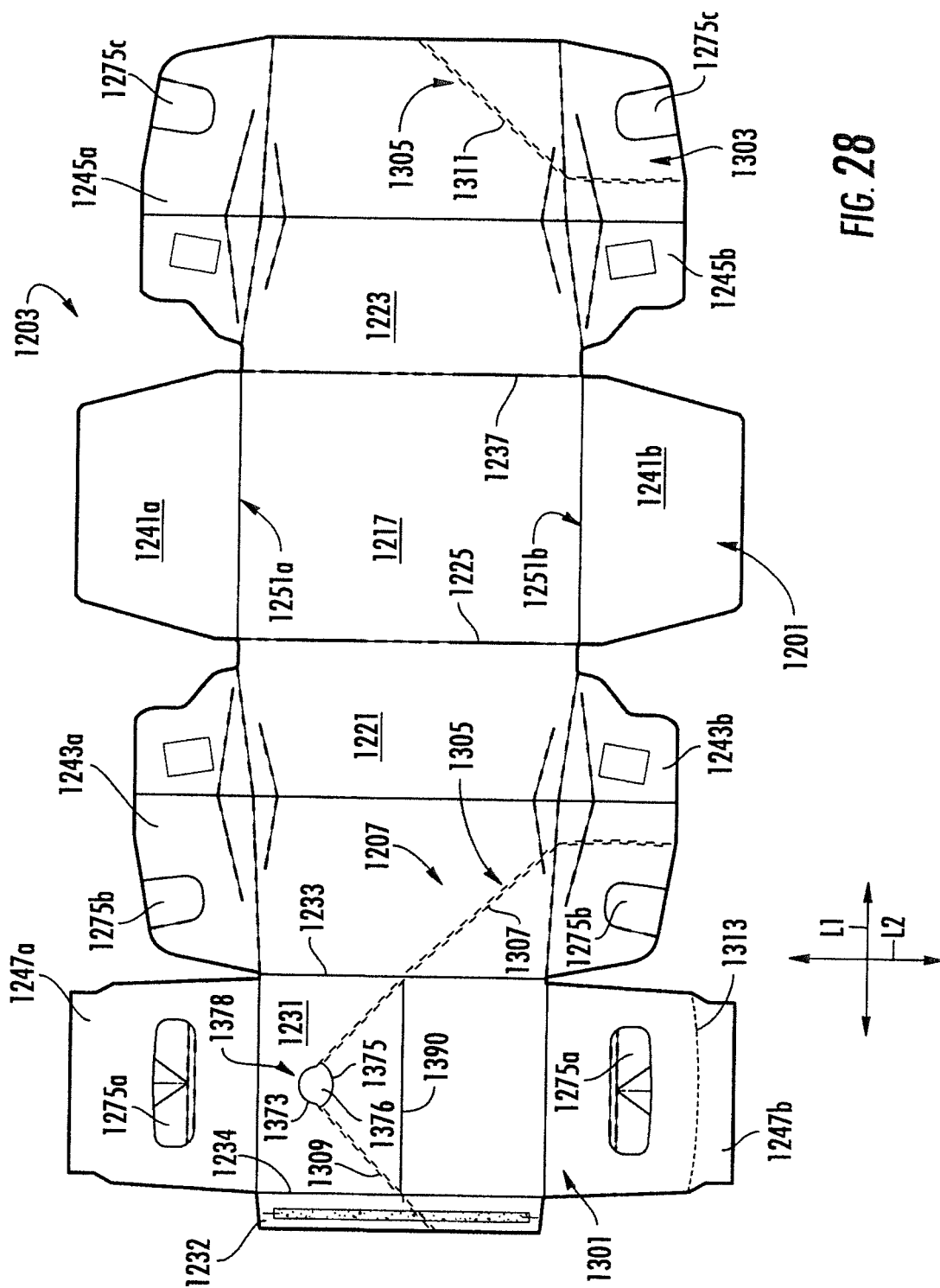


FIG. 28

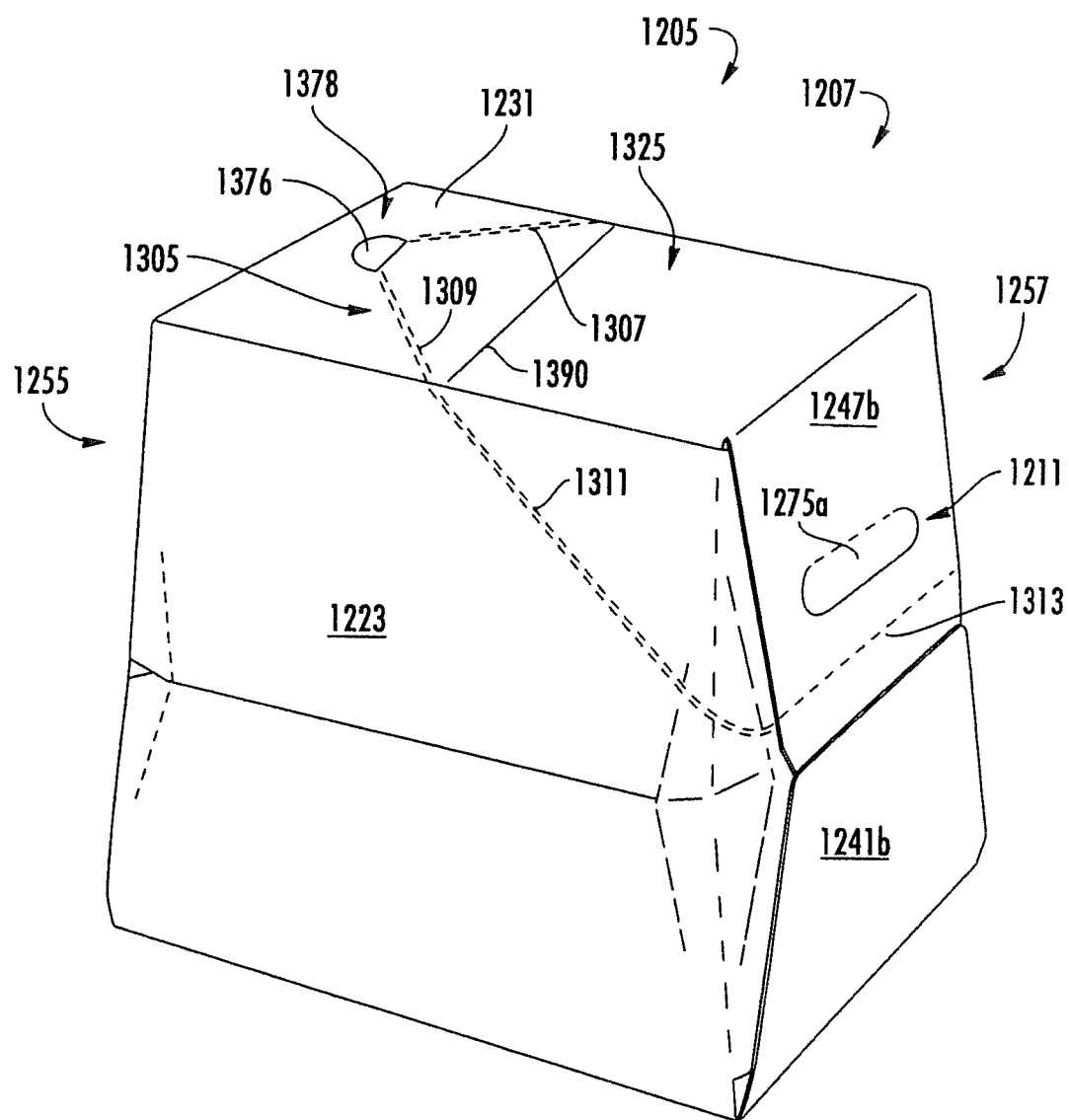


FIG. 29

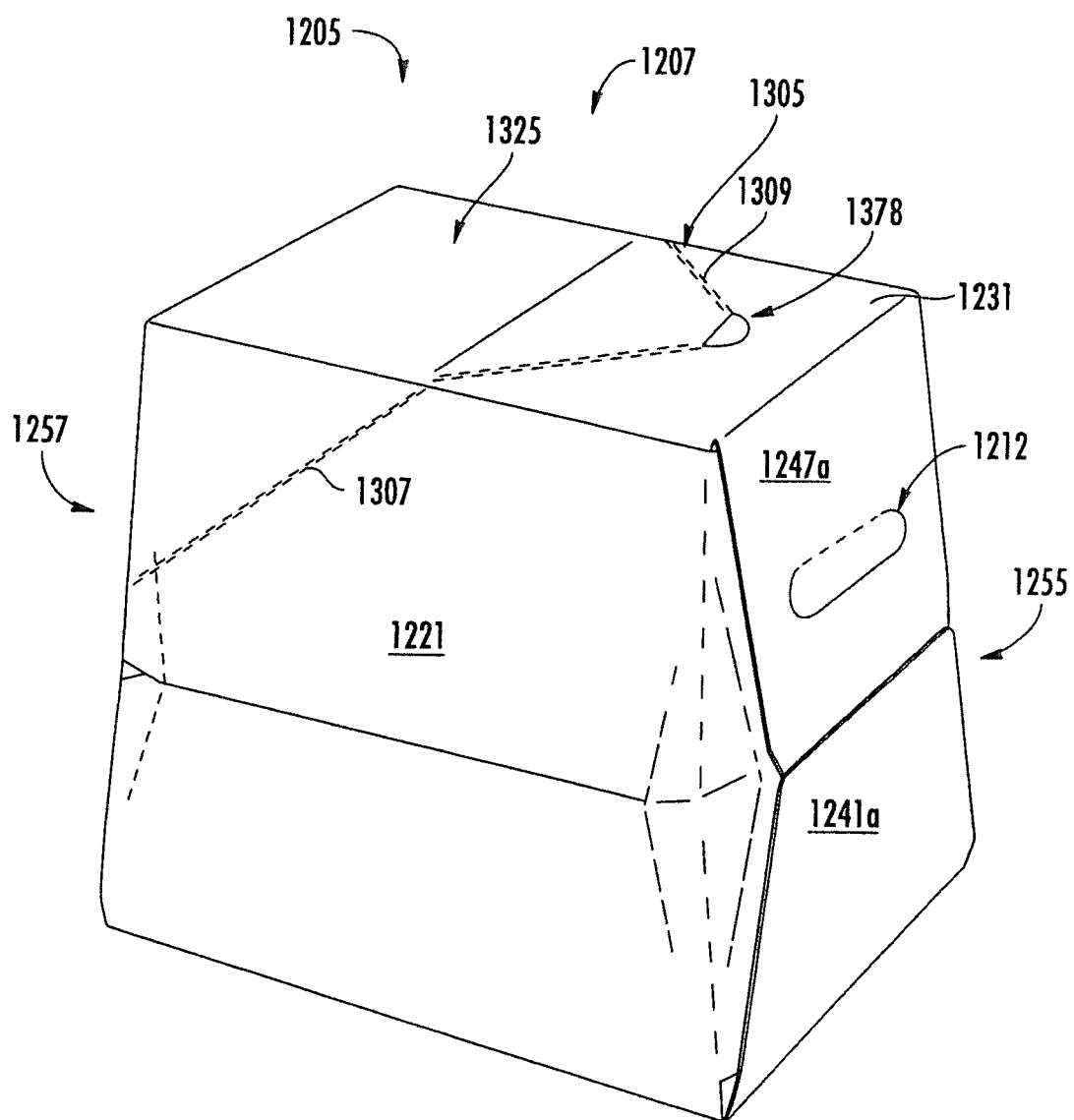
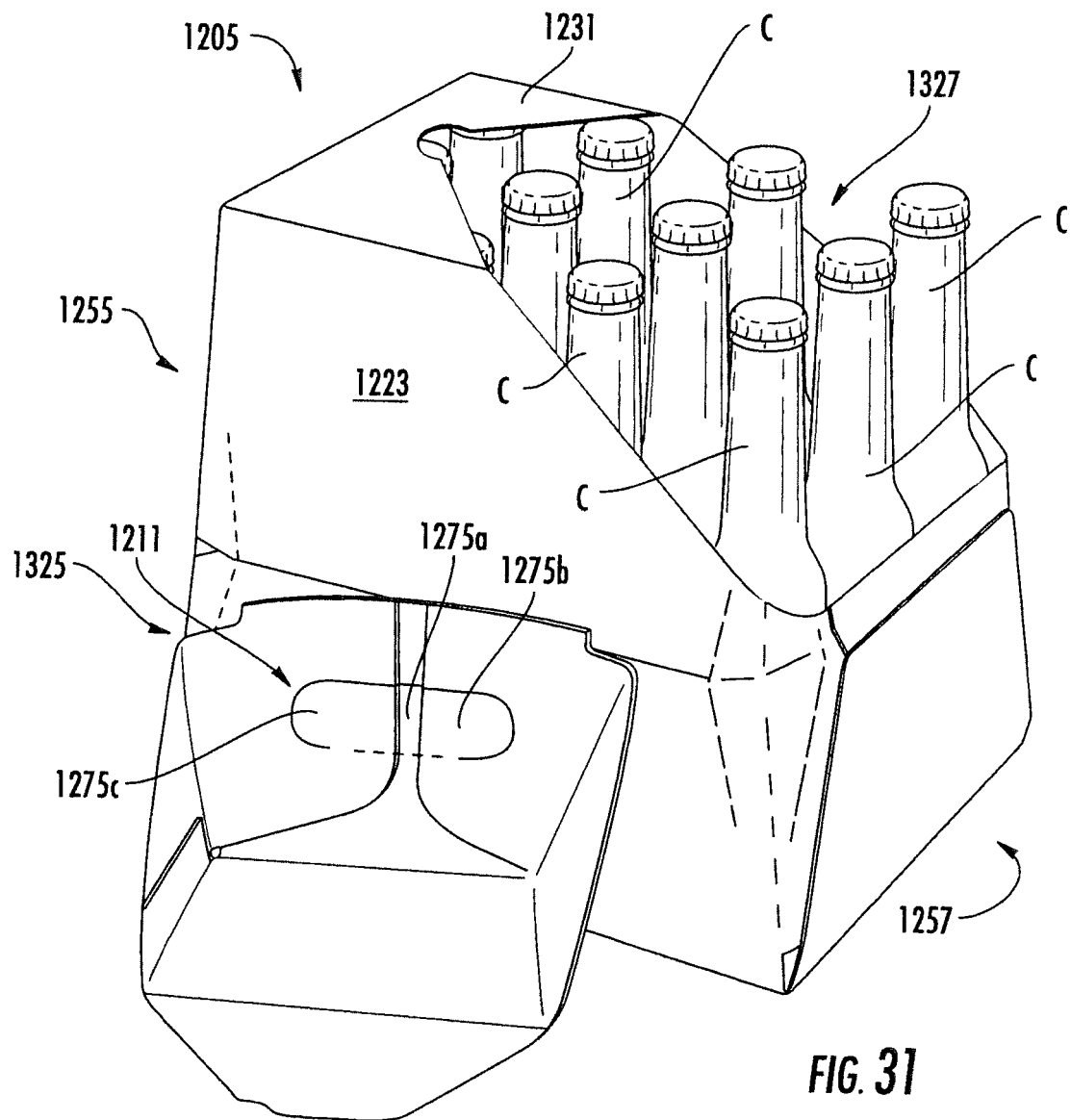


FIG. 30



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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