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Remarks:
This application was filed on 21-12-2020 as a divisional application to the application mentioned under INID code 62.

(54) TRANSPORT SYSTEM

(57) A transport system (247, 447) comprises an outer container (233) comprising a bottom (235) and a plurality of sidewalls (237, 238) extending upwardly from the bottom (235), the plurality of sidewalls (237, 238) extend around an interior (231) of the outer container (233) and intersects at respective interior curved corners (239), at least one carrier (105, 305) disposed in the interior (231) of the outer container (233), the at least one carrier (105, 305) comprising a plurality of panels extending around an interior space (110a, 110b) of the at least one carrier (105, 305), the plurality of panels comprising a front panel (125a), a back panel (125b), at least one side panel (127a, 131a, 127b, 131b), at least one bottom panel (173b), and at least one central panel (145a, 145b), the at least one side panel (127a, 131a, 127b, 131b) comprises a plurality of side panel sections that comprises a first side panel section (135a, 135b, 149a, 149b), a second side panel section (137a, 137b, 151a, 151b), and a third side panel section (141a, 141b, 155a, 155b), the first side panel section (135a, 135b, 149a, 149b) is foldably connected to the second side panel section (137a, 137b, 151a, 151b), and the second side panel section (137a, 137b, 151a, 151b) is foldably connected to the third side panel section (141a, 141b, 155a, 155b), the plurality of side panel sections are flexibly reconfigurable and form at least one curved corner (223, 225, 227, 229) of the at least one carrier (105, 305) and a divider flap (189a, 199a, 189b, 199b) extending from the at least one central panel (145a, 145b) to one of the front panel (125a) and the back panel (125b) in the interior space (110a, 110b) of the at least one carrier (105, 305), the at least one curved corner (223, 225, 227, 229) of the carrier (105, 305) is engaged with a respective interior curved corner (239) of the outer container (233).

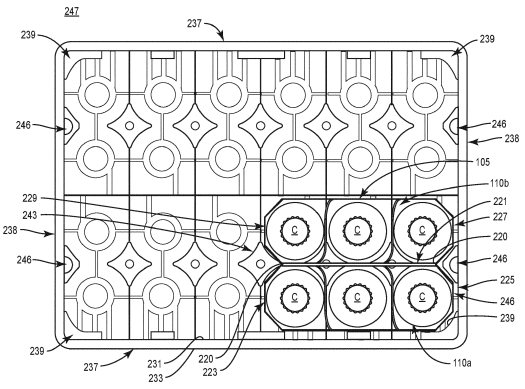

FIG. 9

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Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 62/534,940, filed on July 20, 2017.

INCORPORATION BY REFERENCE

[0002] The disclosure of U.S. Provisional Patent Application No. 62/534,940, filed on July 20, 2017, is hereby incorporated by reference for all purposes as if presented herein in its entirety.

BACKGROUND OF THE DISCLOSURE

[0003] The present disclosure generally relates to carriers or cartons for holding and displaying containers. More specifically, the present disclosure relates to basket-style carriers that include curved interior features.

SUMMARY OF THE DISCLOSURE

[0004] According to one aspect of the disclosure, a carrier for holding a plurality of containers comprises a plurality of panels extending around an interior space of the carrier, the plurality of panels comprising a front panel, a back panel, at least one side panel, at least one bottom panel, and at least one central panel. The carrier further comprises a divider flap extending from the at least one central panel to one of the front panel and the back panel in the interior space of the carrier, the divider flap comprises at least one line of weakening such that the divider flap is generally curved.

[0005] According to another aspect of the disclosure, a blank for forming a container for holding a plurality of containers comprises a plurality of panels for extending around an interior space of the carrier formed from the blank, the plurality of panels comprising a front panel, a back panel, at least one side panel, at least one bottom panel, and at least one central panel. The blank further comprises a divider flap for extending from the at least one central panel to one of the front panel and the back panel in the interior space of the carrier formed form the blank, the divider flap comprises at least one line of weakening such that the divider flap is generally curved upon formation of the carrier (105, 205) from the blank (103, 303).

[0006] According to another aspect of the disclosure, a method of forming a carrier for holding a plurality of containers comprises obtaining a blank comprising a plurality of panels comprising a front panel, a back panel, at least one side panel, at least one bottom panel, and at least one central panel, the blank further comprising a divider flap comprising at least one line of weakening. The method further comprises folding the plurality of panels at least partially around an interior space of the carrier and positioning the divider flap such that the divider flap is generally curved and extends from the at least one central panel to one of the front panel and the back panel in the interior space of the carrier.

[0007] According to another aspect of the disclosure, a transport system comprises an outer container comprising a bottom and plurality of sidewalls extending upwardly from the bottom, the plurality of sidewalls extend around an interior of the outer container and intersects at respective interior curved corners. The transport system further comprises at least one carrier disposed in the interior of the outer container, the at least one carrier comprising a plurality of panels extending around an interior space of the carrier, the plurality of panels comprising a front panel, a back panel, at least one side panel, at least one bottom panel, and at least one central panel. The at least one side panel comprises a plurality of side panel sections that comprises a first side panel section, a second side panel section, and a third side panel section, the first side panel section is foldably connected to the second side panel section, and the second side panel section is foldably connected to the third side panel section, the plurality of side panel sections are flexibly reconfigurable and form at least one curved corner of the at least one carrier. The at least one carrier further comprises a divider flap extending from the at least one central panel to one of the front panel and the back panel in the interior space of the at least one carrier. The at least one curved corner of the at least one carrier is engaged with a respective interior curved corner of the outer container.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] 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.

[0009] 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.

Fig. 1 is a plan view of an exterior surface of a blank for forming a carrier according to a first exemplary embodiment of the disclosure.

Fig. 2 is a first sequential perspective view of a partial folding of the blank of Fig. 1.

Fig. 3 is a second sequential perspective view of a partial folding of the blank of Fig. 1.

Fig. 4 is a third sequential perspective view of a partial folding of the blank of Fig. 1.

Fig. 5 is a perspective view of a carrier formed from the blank of Fig. 1 according to the first exemplary embodiment of the disclosure.

Fig. 6 is a perspective view of the carrier of Fig. 5 loaded with a plurality of containers.

Fig. 7 is a perspective view of the carrier of Fig. 6 with a pair of containers removed.

Fig. 8 is a perspective view of an outer container for use with the carrier of Fig. 6.

Fig. 9 is a plan view of a system including the carrier of Fig. 6 disposed in the outer container of Fig. 8 according to the first exemplary embodiment of the disclosure.

Fig. 10 is a plan view of an exterior surface of a blank for forming a carrier according to a second exemplary embodiment of the disclosure.

Fig. 11 is a perspective view of a carrier formed from the blank of Fig. 10 according to the second exemplary embodiment of the disclosure.

Fig. 12 is a perspective view of the carrier of Fig. 11 loaded with a plurality of containers.

Fig. 13 is a plan view of a system including the carrier of Fig. 11 disposed in the outer container of Fig. 8 according to the second exemplary embodiment of the disclosure.

[0010] Corresponding parts are designated by corresponding reference numbers throughout the drawings.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0011] The present disclosure generally relates to carriers, packages, constructs, sleeves, cartons, or the like, for holding and displaying containers such as jars, bottles, cans, etc. The containers can be used for packaging food and beverage products, for example. The containers 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, glass; plastics such as PET, LDPE, LLDPE, HDPE, PP, PS, PVC, EVOH, and Nylon; and the like; aluminum and/or other metals; or any combination thereof.

[0012] Carriers according to the present disclosure can accommodate containers of numerous different shapes. 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., glass bottles) at least partially disposed within the carrier embodiments. In this specification, the terms "lower," "bottom," "upper," "top," "front," and "back" indicate orientations determined in relation to fully erected carriers.

[0013] As described herein, cartons can be formed by multiple overlapping panels and/or end flaps. Such panels and/or end flaps can be designated in relative terms to one another, e.g., "first", "second", "third", etc., in sequential or non-sequential reference without departing from the disclosure.

[0014] Fig. 1 shows a plan view of an exterior side 101 of a blank 103 used to form a package or basket-style carrier 105 (Fig. 5), in accordance with a first exemplary embodiment of the present disclosure. As shown in Fig. 6, the carrier 105 is sized to contain six containers C, three containers C being contained in a front portion 106 of the carrier 105 and three containers C being contained in a back portion 108 of the carrier 105. As described herein, the carrier 105 has divider flaps 189a, 189b, 199a, 199b that are at least partially reconfigurable to a generally curved configuration, and is provided with generally curved corners 223, 225, 227, 229 (Fig. 3), at least one of which can engage an adjacent interior curved corner 239 of an outer container 233 to minimize clearance therebetwen such that containers C in the carrier 105 are maintained in a substantially stable arrangement during transport and/or storage (Figs. 8 and 9). In this regard, at least the curved corners 223, 225, 227, 229 provide features of the carrier 105 suitable for engagement with the outer container 233 such that the outer container 233 and at least one carrier 105 together form a system 247. In the illustrated embodiment, the containers C can be beverage bottles, but the containers C could be any other suitable type and size of container without departing from the disclosure. The carrier 105 can be sized and shaped to hold more or less than six containers C. In one embodiment, the front portion 106 and the back portion 108 of the carrier 105 each have three containers C. In other embodiments, the front portion 106 and the back portion 108 of the carrier 105 can hold more or less than three containers C without departing from the disclosure.

[0015] As illustrated in Fig. 1, the blank 103 has a longitudinal axis LX and a lateral axis LY. The blank 103 has a front portion 107 for forming the front portion 106 of the carrier 105, and a back portion 109 for forming the back portion 108 of the carrier 105 (Fig. 5). In one embodiment, the front portion 107 and the back portion 109 are separated by the longitudinal centerline CL of the blank 103, as shown. As discussed in further detail below, the blank 103 is at least partially formed into the carrier 105 by folding the blank 103 about fold lines 119, 121, 123 along the centerline CL so that the front portion 107 and the back portion 109 of the blank 103 are overlapped in at least partial face-to-face contact.

[0016] In the illustrated embodiment, the front portion 107 of the blank 103 comprises a front panel 125a and a first front side panel 127a foldably connected to the

front panel 125a at a lateral fold line 129a. A second front side panel 131a, as shown, is foldably connected to the front panel 125a at a lateral fold line 133a. As shown, the first front side panel 127a has an at least partially segmented configuration that includes a first side panel section 135a foldably connected to the front panel 125a at the lateral fold line 129a, a second side panel section 137a foldably connected to the adjacent first side panel section 135a at a lateral fold line 139a, and a third side panel section 141a foldably connected to the adjacent second side panel section 137a at a lateral fold line 143a and to a central panel 145a (broadly, "front central panel") at a lateral fold line 147a, as described further herein. Similarly, the second front side panel 131a has an at least partially segmented configuration that includes a first side panel section 149a foldably connected to the front panel 125a at the lateral fold line 133a, a second side panel section 151a foldably connected to the adjacent first side panel section 149a at a lateral fold line 153a, and a third side panel section 155a foldably connected to the adjacent second side panel section 151a at a lateral fold line 157a and to a keel 159a at a lateral fold line 161a, as described further herein. The keel 159a can include a notch 160a for engaging a portion of the bottom of the carrier 105 for stability upon erection of the carrier 105. As described further herein, the first front side panel 127a and the second front side panel 131a are flexibly reconfigurable to form curved corners 223, 225 of the carrier 105 via the relative movement of the respective first, second, and third side panel sections 135a, 137a, 141a and 149a, 151a, 155a (Fig. 5).

[0017] As shown in Fig. 1, the front portion 107 of the blank 103 also includes a front handle reinforcement flap 163a foldably connected to the central panel 145a at a portion of the lateral fold line 147a and separated from the front panel 125a and the first front side panel 127a by a cut 165a. The front handle reinforcement flap 163a includes an opening 167a and a handle flap 169a adjacent to the opening 167a and foldably connected to the handle reinforcement flap 163a at a fold line 171a.

[0018] The front portion 107 of the blank 103, as shown in Fig. 1, includes a bottom flap 173a foldably connected to a bottom corner panel 175a at a longitudinal fold line 177a, with the bottom corner panel 175a foldably connected to the front panel 115a at a longitudinal fold line 179a. In the illustrated embodiment, the bottom panel 173a includes strips 181a formed by lateral tear lines 183a. The strips 181a are adjacent notches 185a that extend through a portion of the front panel 125a and the bottom corner panel 175a and that intersect the fold line 179a.

[0019] In the embodiment shown in Fig. 1, and as described above, the front central panel 145a is foldably connected to the third panel section 141a of the first front side panel 127a at the lateral fold line 147a. The central panel 145a includes handle features including a handle opening 187a. As shown in Fig. 1, a first divider flap 189a extends from the central panel 145a and includes an intermediate lateral line of weakening 191a, e.g., that is spaced apart from a lateral fold line 197a along the divider flap 189a. The divider flap 189a, as shown, is at least partially separable from the central panel 145a at a line of weakening 193a such that a portion 192a of the divider flap 189a can be curved, bent, flexed, and/or folded away from the central panel 145a, as described herein. As shown, an adhesive flap 195a is foldably attached to the divider flap 189a at the lateral fold line 197a. As also shown, a second or third divider flap 199a extends from the central panel 145a and is at least partially separable from the central panel 145a at a line of weakening 194a such that a portion 196a of the divider flap 199a can be curved, bent, flexed, and/or folded away from the central panel 145a, as described herein. The divider flap 199a is also at least partially separable from the second divider flap 189a along the line of weakening 193a. The second divider flap 199a, as shown, includes an intermediate lateral line of weakening 201a, e.g., that is spaced apart from a lateral fold line 203a, and the adhesive flap 195a is foldably connected to the second divider flap 199a at the lateral fold line 203a such that the adhesive flap 195a is foldably connected to each of the first divider flap 189a and the second divider flap 199a. In one embodiment, the divider flaps 189a, 199a, each have a length L1 that corresponds to the distance from an end of the respective line of weakening 193a, 194a in the central panel 145a to a respective lateral fold line 197a, 203a connecting the adhesive flap 195a to the divider flaps 189a, 199a. The central panel 145a could be otherwise shaped, arranged, and/or configured, and could have other features, without departing from the disclosure.

[0020] In the illustrated embodiment, the features of the back portion 109 of the blank 103 include a back panel 125b, a first back side panel 127b, a second back side panel 131b, a keel 159b, and a back central panel 145b having associated features that are generally a mirror-image of the corresponding panels and flaps of the front portion 107 of the blank 103. For example, a first or second divider flap 189b and a second or fourth divider flap 199b extend from the central panel 145b. Corresponding components (e.g., panels, flaps, fold lines, cuts, etc.) have been designated by corresponding reference numbers that differ by the "a" or "b" suffix, with the "a" components corresponding to the front portion 107 of the blank 103 and the "b" components corresponding to the back portion 109 of the blank 103.

[0021] As shown in Fig. 1, and in contrast to the front portion 107, the back portion 109 of the blank 103 includes the bottom panel 173b having a proximal portion 205 foldably connected to a distal portion 207 at a longitudinal fold line 209. As shown, the bottom panel 173b includes apertures 211 adjacent the strips 181b and a pair of central openings 213 surrounded by lines of weakening 215 that define tabs 214 therebetween. The central openings 213 can receive a portion of an outer container 233 (Figs. 8 and 9) for holding the carrier 105, as described further herein.

[0022] Any of the panels, flaps, fold lines, cuts, or other features could be otherwise shaped, arranged, and/or omitted from the blank 103 without departing from the disclosure. The blank 103 could be sized and/or shaped to accommodate more or less than six containers without departing from this disclosure.

[0023] Still referring to Fig. 1, and referring additionally to Figs. 2-4, in one embodiment, the carrier 105 can be formed or erected from the blank 103 by folding the front panel 125a, the first front side panel 127a, the second front side panel 131a, the central panel 145a, and the keel 159a relative to one another at fold lines 129a, 133a, 147a, and 161a in the direction of the arrow A1 such that the front panel 125a is substantially parallel to the central panel 145a and the keel 159a and the first and second front side panels 127a, 131a are disposed opposite one another. The first and second front side panels 127a, 131a may have an at least partially curved configuration via the flexible arrangement of the respective first, second, and third side panel sections 135a, 137a, 141a and 149a, 151a, 155a. Similarly, the back panel 125b, the first back side panel 127b, the second side panel 131b, the central panel 145b, and the keel 159b can also be folded relative to one another at fold lines 129b, 133b, 147b, and 161b in the direction of the arrow A1 such that the back panel 125b is substantially parallel to the central panel 145b and the keel 159b and the side panels 127b, 131b are disposed opposite one another. The side panels 127b, 131b may have an at least partially curved configuration via the flexible arrangement of the respective first, second, and third side panel sections 135b, 137b, 141b and 149b, 151b, 155b. In such a configuration, the keels 159a, 159b are brought into proximity with but maintained in substantially coplanar separation with the marginal portion of the respective central panels 145a, 145b. The handle reinforcement flaps 163a, 163b can be folded at the respective fold lines 147a, 147b in the direction of the arrow A2 to be overlapped on the central panels 145a, 145b and the keels 159a, 159b such that the respective central panels and keels 145a, 159a and 145b, 159b are connected via the respective handle reinforcement flaps 163a, 163b and with the handle openings 167a, 187a of the front portion 107 of the blank 103 overlapped with the handle openings 167b, 187b of the back portion 109 of the blank 103 overlapped in at least partial face-to-face contact. In such an arrangement, a front interior space 110a of the carrier 105 is defined in the front portion 106 of the carrier 105 between the front panel 125a and the central panel 145a, and a back interior space 110b of the carrier 105 is defined in the back portion 108 of the carrier 105 between the back panel 125b and the central panel 145b.

[0024] The front portion 106 and the back portion 108 of the partially-formed carrier 105 having an open bottom can be folded about fold lines 119, 121, 123 along the centerline CL of the blank 103 in the direction of the respective arrows A3 and A4 so that the respective central panels 145a, 145b and keels 159a, 159b are brought into face-to-face contact and adhered to one another, for example, with an adhesive. A first crease 220 is be formed between the side panels 127a, 127b and a second crease 220 is formed between the side panels 131a, 131b, and each opposed crease 220 can receive a portion of an outer container 233 (Figs. 8 and 9) for holding the carrier 105, as described further herein. A handle 221, as shown, extends upwardly along a central portion of the carrier 105, and includes the handle reinforcement flaps 163a, 163b and portions of the central panels 145a, 145b.

[0025] As shown, the divider flaps 189a, 199a can also be folded away from the remainder of the central panel 145a in the direction of the respective arrows A5 and A6 and separated from one another along portions of the cut line 193a. The divider flaps 189a, 199a can be folded toward the front panel 125a via at least partially flexing, bending, and/or curving of the respective sections 192a, 196a, with the adhesive flap 195a folded into face-to-face contact with the front panel 125a at the respective fold lines 197a, 203a to define three container-receiving spaces 217 in the front interior space 110a of the carrier 105 (Fig. 5). Similarly, the divider flaps 189b, 199b can be folded away from remainder of the central panel 145b in the direction of the respective arrows A7 and A8 and separated from one another along portions of the cut line 193b. The adhesive flap 195b can be folded into face-to-face contact with the back panel 125b at the respective fold lines 197b, 203b to define three container-receiving spaces 219 (Fig. 5) in the back interior space 110b of the carrier 105. In such a configuration, the first and second divider flaps 189a, 199a, 189b, 199b can be at least partially flexed, bent, or curved at the respective intermediate lines of weakening 191a, 201a, 191b, 201b and/or the portions 192a, 196a, 192b, 196b, as described further herein.

[0026] With continued reference to Figs. 1-4, the bottom of the carrier 105 can be closed by folding the bottom flap 173a and the bottom panel 173b at respective fold lines 177a, 177b toward one another in the direction of the arrows A10 and A9 such that the bottom flap 173a and the bottom panel 173b are at least partial overlapping face-to-face contact. Such overlap over the bottom flap and bottom panel 173a, 173b may cause at least partial folding of the bottom corner panels 175a, 175b at respective fold lines 179a, 179b to form oblique portions of the bottom of the carrier 105. The overlap and contact of various portions of the blank 103 as described herein may be accomplished with an adhesive such as glue, or, in embodiments, through alternative closures such as tabs and slots. In embodiments, the aforementioned steps in forming the carrier 105 from the blank 103 may be performed differently, for example, in a different order, to form the carrier 105.

[0027] As shown in Figs. 5, 6, and 7, the assembled carrier 105 is illustrated, with the interior spaces 110a, 110b each defined by a first distance D1 corresponding to a distance that the front panel 125a is positioned from the central panel 145a as well as a distance that the back

panel 125b is positioned from the central panel 145b, and with the length L1 (Fig. 1) of the divider flaps 189a, 199a, 189b, 199b being greater than the distance D1. In such an arrangement, a linear distance (measured through the interior spaces 110a, 110b) between an end of the line of weakening 194a and the fold line 203a, an end of the line of weakening 193a and the fold line 197a, an end of the line of weakening 194b and the fold line 203b, and an end of the line of weakening 193b and the fold line 197b are each equal to about D1. In one embodiment, a radius of curvature of one or more of the divider flaps 189a, 199a, 189b, 199b is equal to about D1. The divider flaps 189a, 199a, 189b, 199b could be otherwise shaped, arranged, and/or configured without departing from the disclosure. In one embodiment, the length L1 of the divider flaps 189a, 199a, 189b, 199b can be about 71.5mm, and the distance D1 can be about 65mm. The lengths and distances described herein can be more or less than the dimensions listed herein without departing from the disclosure.

[0028] In this regard, the divider flaps 189a, 199a, 189b, 199b are positioned to extend between the central panels 145, 145b and the front or back panel 125a, 125b with at least partially reconfigurable or foldable portions between the fold lines 191a, 197a, 201a, 203a, 191b, 197b, 201b, 203b and/or the portions 192a, 196a, 192b, 196b that curve to form a generally curved shape of the divider flaps 189a, 199a, 189b, 199b. In particular, in order to accommodate the spacing D1 between the front panel 125a and the central panel 145a and the back panel 125b and the central panel 145b, the divider flaps 189a, 199a, 189b, 199b at least partially curve, bend, fold and/or flex at the respective intermediate lines of weakening 191a, 201a, 191b, 201b and/or at the portions 192a, 196a, 192b, 196b upon formation or erection of the carrier 105. As such, the respective intermediate lines of weakening 191a, 201a, 191b, 201b facilitate curving, bending, folding and/or flexing of the respective divider flaps 189a, 199a, 189b, 199b. In this regard, the divider flaps 189a, 199a, 189b, 199b are reconfigurable at the respective intermediate lines of weakening 191a, 201a, 191b, 201b and/or portion 192a, 196a, 192b, 196b toward a generally curved configuration so as to accommodate the spacing D1 of the interior spaces 110a, 110b as compared to, for example, conventional divider flaps having a straight configuration that is not reconfigurable so as to have interior spaces with a spacing greater than D1.

[0029] Still referring to Figs. 1, 6, and 7, the side panel sections 135a, 137a, 141a of the side panel 127a, and the side panel sections 149a, 151a, 155a of the side panel 131a, the side panel sections 135b, 137b, 141b of the side panel 127b, and the side panel sections 149b, 151b, 155b of the side panel 131b are flexibly reconfigurable at one or more of respective fold lines 129a, 139a, 143a, 147a, 133a, 153a, 157a, 161a 129b, 139b, 143b, 147b, 133b, 153b, 157b, 161b to form the generally curved corners 223, 225, 227, 229 of the carrier 105. In this regard, the curved corners 223, 225, 227, 229 may closely engage or approximate the curvature of containers C disposed in the outermost container-receiving spaces 217, 219 of the carrier 105. Furthermore, when the containers C are disposed in the carrier 105, the divider flaps 189a, 199a, 189b, 199b can closely engage or approximate the curvature of a respective adjacent container C, for example, to minimize free space in the interior spaces 110a, 110b of the carrier 105.

[0030] Referring additionally to Figs. 8 and 9, the carrier 105 can be placed in the interior 231 of an outer crate or outer container 233 for storage and/or transport. As shown, the outer container 233 includes a bottom 235 with sidewalls 237, 238 that extend upwardly from the bottom 235 and intersect at respective interior curved corners 239. The interior curved corners 239 have a curved configuration along the interior 231 of the outer container 233. The bottom 235 of the outer container 233, as shown, includes a divider 241 bisecting the interior 231 of the outer container 233 and a series of posts 243 extending upwardly from the bottom 235 of the outer container 233. As illustrated, flanges 245 extend from the posts 243 to the adjacent sidewalls 237 and the divider 241 of the outer container 233. As also shown, a series of vertical protrusions 246 can extend from the sidewalls 238 into the interior 231 of the container 233.

[0031] The carrier 105 can be placed in the interior 231 of the outer container 233 to form a storage or transport system 247. As shown, the respective curved corners 223, 225, 227, 229 of the carrier 105 can be disposed in engagement with a respective adjacent interior curved corner 239 of the outer container 233. In this regard, the engagement of a curved corner 223, 225, 227, 229 of the carrier 105 with a respective interior curved corner 239 of the outer container 233 provides a configuration in which a minimized clearance is present between the interior curved corners 239 of the outer container 233 and a respective curved corner 223, 225, 227, 229 of the carrier 105, e.g., so that space in the interior 231 of the outer container 233 is optimized to accommodate an increased number of carriers 105 and containers C, for example, as compared to conventional outer containers without such features. Further, each central opening 213 (Fig. 1) in the bottom end panel 173b of the carrier 105 is sized to accommodate a post 243 of the outer container 233. In one embodiment, the tabs 214 surrounding the respective central openings 213 can fold upwardly at the respective lines of weakening 215 to present a wider opening for receipt of the posts 243. In this regard, a carrier 105 in the interior 231 of the outer container 233 can be positioned such that a post 243 extends upwardly through the central openings 213 to be disposed between four adjacent containers C, for example, to maintain positional stability and/or to cushion the containers C from impacts or vibrations. In one embodiment, the opposing creases 220 of a carrier 105 can engage, e.g., at least partially receive, a post 243 and a vertical protrusion 246 of the outer container 233. In one embodiment, opposing

creases 220 of a carrier 105 can each engage a post 243. In this regard, multiple carriers 105 can be placed side-by-side in the interior 231 of the outer container 233 such that the containers C disposed in the carriers 105 are provided with stability and protection via the engagement of the curved corners 223, 225, 227, 229 of the carriers 105 with respective interior curved corners 239 of the outer container 233, the presence of the posts 243 between containers C, the engagement of the creases 220 of the carrier 105 with the vertical protrusions 246 and/or the posts 243 of the outer container 233, and/or the minimized free space between carriers 105 and containers C in the interior 231 of the outer container 233. While a single carrier 105 has been shown disposed in the interior 231 of the outer container 233 for clarity of illustration, it will be understood that multiple carriers 105 can be disposed in the interior 231 of the outer container 233.

[0032] Figs. 10-13 illustrate a second exemplary embodiment of the disclosure similar to the first embodiment, and like or similar reference numbers are indicated throughout the drawings to indicate like or similar features. The second exemplary embodiment of the carrier, generally designated 305, is similar to the carrier 105 (Fig. 5) of the first embodiment, except that the second embodiment is a 2x2 configuration for holding four containers C, with two containers C in the front portion 106 and two containers in the back portion 108 of the carrier 305. Fig. 10 illustrates a blank 303 for forming the carrier 305 of the second embodiment. The blank 303 includes a single divider flap 189a extending from the central panel 145a and a single divider flap 189b extending from the central panel 145b in the back portion 109 of the blank 303. The divider flaps 189a, 189b divide the respective front interior space 110a and back interior space 110b of the carrier 305 into two container-receiving spaces 217, 219.

[0033] Still referring to Fig. 10, and referring additionally to Figs. 11 and 12, the carrier 305 can be formed in a similar manner as the carrier 105 of the first embodiment, with the divider flaps 189a, 189b folded toward the respective front panel 125a and back panel 125b via at least partially flexing, bending, and/or curving of the respective sections 192a, 192b, with the respective adhesive flaps 195a, 195b folded into face-to-face contact with the respective front panel 125a and back panel 125b at the respective fold lines 197a, 197b to define respective pairs of container-receiving spaces 217, 219 in the respective front interior space 110a and back interior space 110b of the carrier 305. The respective intermediate lines of weakening 191a, 201a, 191b, 201b facilitate curving, bending, folding and/or flexing of the respective divider flaps 189a, 189b in the manner described above. As shown in Fig. 11, the assembled carrier 305 is illustrated, in which the interior spaces 110a, 110b ,are each defined by the first distance D1 corresponding to a distance that the front panel 125a is positioned from the central panel 145a as well as a distance that the back panel 125b is positioned from the central panel 145b. The lengths and distances described herein can be more or less than the dimensions listed without departing from the disclosure. The carrier 305 can be loaded with containers C that are contained in the container-receiving spaces 217, 219 in a similar manner as described above with respect to carrier 105 (Fig. 6).

[0034] Referring to Fig. 13, as with the first embodiment, the carrier 305 can be placed in the interior 231 of the outer container 233 to form a storage or transport system 447. As shown, the curved corners 223, 225, 227, 229 of the carrier 305 can be disposed in engagement with an adjacent interior curved corner 239 of the outer container 233 such that a post can 243 extend upwardly through the central openings 213 to be disposed between four adjacent containers C, for example, to maintain positional stability and/or to cushion the containers C from impacts or vibrations. Further, an adjacent vertical protrusion 246 and post 243 can engage the creases 220 of the carrier 305. In this regard, multiple carriers 305 can be placed side-by-side in the interior 231 of the outer container 233 such that the containers C disposed in the carriers 305 are provided with stability and protection via the engagement of the curved corners 223, 225, 227, 229 of the carriers 305 with respective interior curved corners 239 of the outer container 233, the presence of the posts 243 between containers C, the engagement of the creases 220 of the carrier 305 with the vertical protrusions 246 and/or the posts 243 of the outer container 233, and/or the minimized free space between carriers 305 and containers C in the interior 231 of the outer container 233. While a single carrier 305 has been shown disposed in the interior 231 of the outer container 233 for clarity of illustration, it will be understood that multiple carriers 105 can be disposed in the interior 231 of the outer container 233.

[0035] In general, the blank may be constructed from paperboard having a caliper so that it is heavier and more rigid than ordinary paper. The blank can also be constructed of other materials, such as cardboard, or any other material having properties suitable for enabling the carrier to function at least generally as described above. The blank can be coated with, for example, a clay coating. The clay coating may then be printed over with product, advertising, and other information or images. The blanks may then be coated with a varnish to protect 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. The blanks can also be laminated to or coated with one or more sheet-like materials at selected panels or panel sections.

[0036] 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.

[0037] In accordance with the exemplary embodiments, 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 or depressed 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.

[0038] The above embodiments may be described as having one or more panels adhered together by glue during erection of the carrier embodiments. The term "glue" is intended to encompass all manner of adhesives commonly used to secure carrier panels in place.

[0039] The foregoing description of the disclosure illustrates and describes various exemplary embodiments. Various additions, modifications, changes, etc., could be made to the exemplary embodiments without departing from the spirit and 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 of the disclosure, but the disclosure is capable of use in various other combinations, modifications, and environments and is capable of changes or modifications within the scope of the inventive concept as expressed herein, commensurate with the above teachings, and/or within the skill or knowledge of the relevant art. Furthermore, certain features and characteristics of each embodiment may be selectively interchanged and applied to other illustrated and non-illustrated embodiments of the disclosure.

Claims

1. A transport system (247, 447), comprising:

an outer container (233) comprising a bottom (235) and plurality of sidewalls (237, 238) extending upwardly from the bottom (235), the plurality of sidewalls (237, 238) extend around an interior (231) of the outer container (233) and intersects at respective interior curved corners (239);

at least one carrier (105, 305) disposed in the interior (231) of the outer container (233), the at least one carrier (105, 305) comprising:

a plurality of panels extending around an interior space (110a, 110b) of the at least one carrier (105, 305), the plurality of panels comprising a front panel (125a), a back panel (125b), at least one side panel (127a, 131a, 127b, 131b), at least one bottom panel (173b), and at least one central panel (145a, 145b),

the at least one side panel (127a, 131a, 127b, 131b) comprises a plurality of side panel sections that comprises a first side panel section (135a, 135b, 149a, 149b), a second side panel section (137a, 137b, 151a, 151b), and a third side panel section (141a, 141b, 155a, 155b), the first side panel section (135a, 135b, 149a, 149b) is foldably connected to the second side panel section (137a, 137b, 151a, 151b), and the second side panel section (137a, 137b, 151a, 151b) is foldably connected to the third side panel section (141a, 141b, 155a, 155b), the plurality of side panel sections are flexibly reconfigurable and form at least one curved corner (223, 225, 227, 229) of the at least one carrier (105, 305); and

a divider flap (189a, 199a, 189b, 199b) extending from the at least one central panel (145a, 145b) to one of the front panel (125a) and the back panel (125b) in the interior space (110a, 110b) of the at least one carrier (105, 305),

the at least one curved corner (223, 225, 227, 229) of the carrier (105, 305) is engaged with a respective interior curved corner (239) of the outer container (233).

2. The transport system (247, 447) of claim 21,

wherein the outer container (233) comprises at least one protrusion (246) extending from at least one sidewall (237, 238) of the plurality of sidewalls (237, 238),

wherein the at least one side panel (127a, 131a, 127b, 131b) is a first front side panel (127a) and the

plurality of panels further comprises a second front side panel (131a), a first back side panel (127b), and a second back side panel (131b), and a crease (220) is formed between at least one of:

the first front side panel (127a) and the first back side panel (127b); and
the second front side panel (131a) and the second back side panel (131b),

the crease (220) at least partially receives the at least one protrusion (246).

3. The transport system (247, 447) of claim 22, wherein the outer container (233) comprises at least one post (243) extending upwardly from the bottom (235),
the recess (220) of the carrier (105, 305) is a first recess (220) between the first front side panel (127a) and the first back side panel (127b) and the carrier (105, 305) comprises a second recess (220) between the second front side panel (131a) and the second back side panel (131b),
at least one of the first recess (220) and the second recess (220) at least partially receives the at least one protrusion (246) and the other of the first recess (220) and the second recess (220) at least partially receives the at least one post (243).

4. The transport system (247, 447) of claim 21, wherein the divider flap (189a, 199a, 189b, 199b) comprises at least one line of weakening (191a, 201a, 191b, 201b) such that the divider flap (189a, 199a, 189b, 199b) is generally curved.

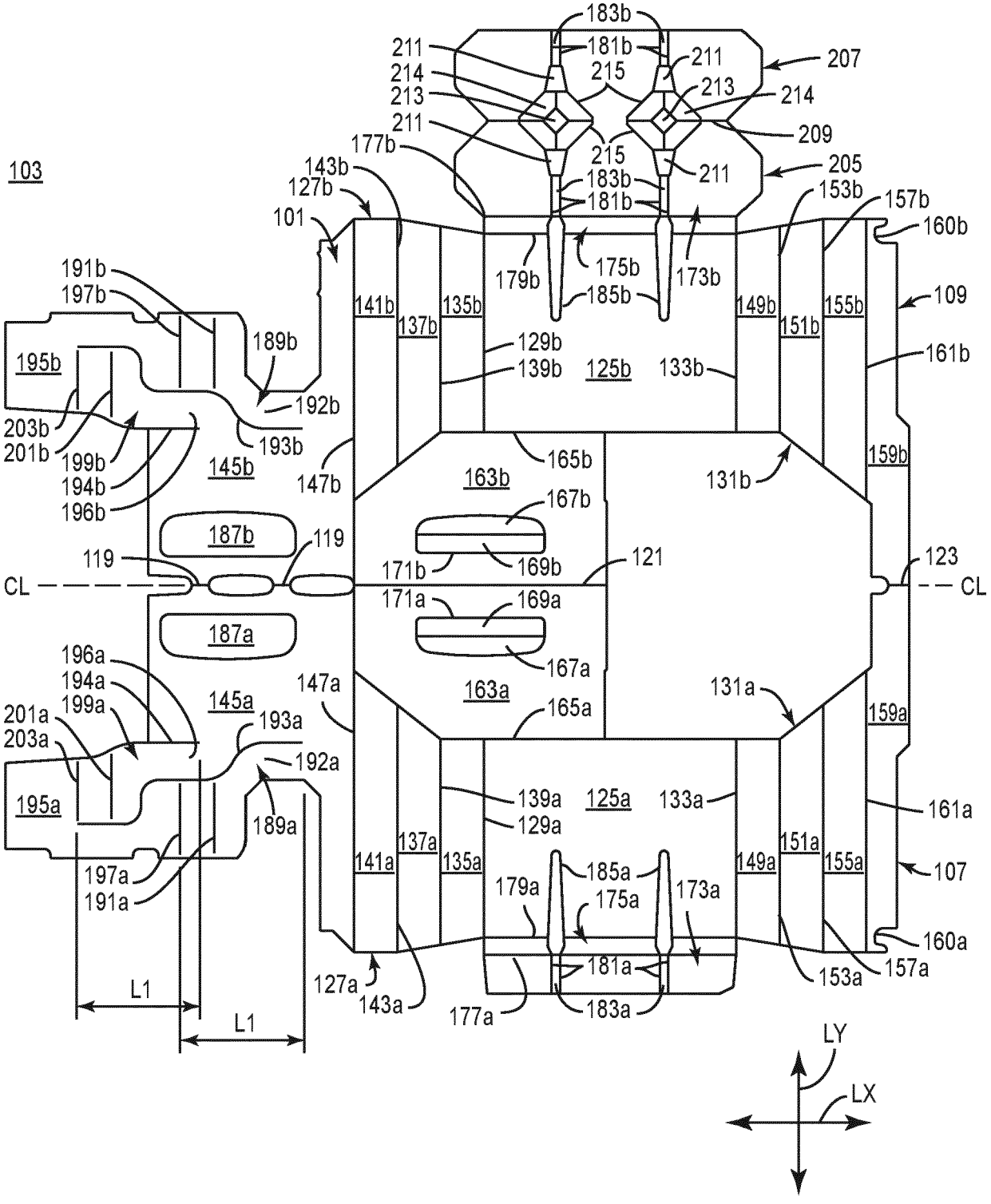
5. The transport system (247, 447) of claim 24, wherein the at least one line of weakening (191a, 201a, 191b, 201b) facilitates curving of the divider flap (189a, 199a, 189b, 199b).

6. The transport system (247, 447) of claim 25, wherein an adhesive flap (195a, 195b) is foldably connected to the divider flap (189a, 199a, 189b, 199b) at a fold line (197a, 203a, 197b, 203b) and the at least one line of weakening (191a, 201a, 191b, 201b) is spaced apart from the fold line (197a, 203a, 197b, 203b).

7. The transport system (247, 447) of claim 25, wherein the divider flap (189a, 199a, 189b, 199b) defines a plurality of container-receiving spaces (217, 219) in the interior space (110a, 110b) of the at least one carrier (105, 305), the divider flap (189a, 199a, 189b, 199b) is configured to curve at the at least one line of weakening (191a, 201a, 191b, 201b) to contour a container (C) received in a respective container-receiving space in the at least one carrier (105, 305).

8. The transport system (247, 447) of claim 21, wherein the interior space (110a, 110b) of the at least one carrier (105, 305) is a front interior space (110a) of the at least one carrier (105, 305) between the front panel (125a) and the at least one central panel (145a, 145b), and the at least one carrier (105, 305) comprises a back interior space (110b) between the back panel (125b) and the at least one central panel (145a, 145b), wherein the divider flap (189a, 199a, 189b, 199b) is a first divider flap (189a) extending from the at least one central panel (145a, 145b) to the front panel (125a) in the front interior space (110a) of the at least one carrier (105, 305), and the at least one carrier (105, 305) further comprises a second divider flap (189b) extending from the at least one central panel (145a, 145b) to the back panel (125b) in the back interior space (110b) of the at least one carrier (105, 305).

9. The transport system (447) of claim 28, further comprising a third divider flap (199a) extending from the at least one central panel (145a, 145b) to the front panel (125a) in the front interior space (110a) of the at least one carrier (105) and a fourth divider flap (199b) extending from the at least one central panel (145a, 145b) to the back panel (125b) in the back interior space (110b) of the at least one carrier (105), wherein the second divider flap (189b), the third divider flap (199a), and the fourth divider flap (199b) each comprise at least one line of weakening (191b, 201a, 201b) and each of the first divider flap (189a), the second divider flap (189b), the third divider flap (199a), and the fourth divider flap (199b) curves at the respective at least one line of weakening (191a, 191b, 201a, 201b) upon formation of the at least one carrier (105).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107
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FIG. 1

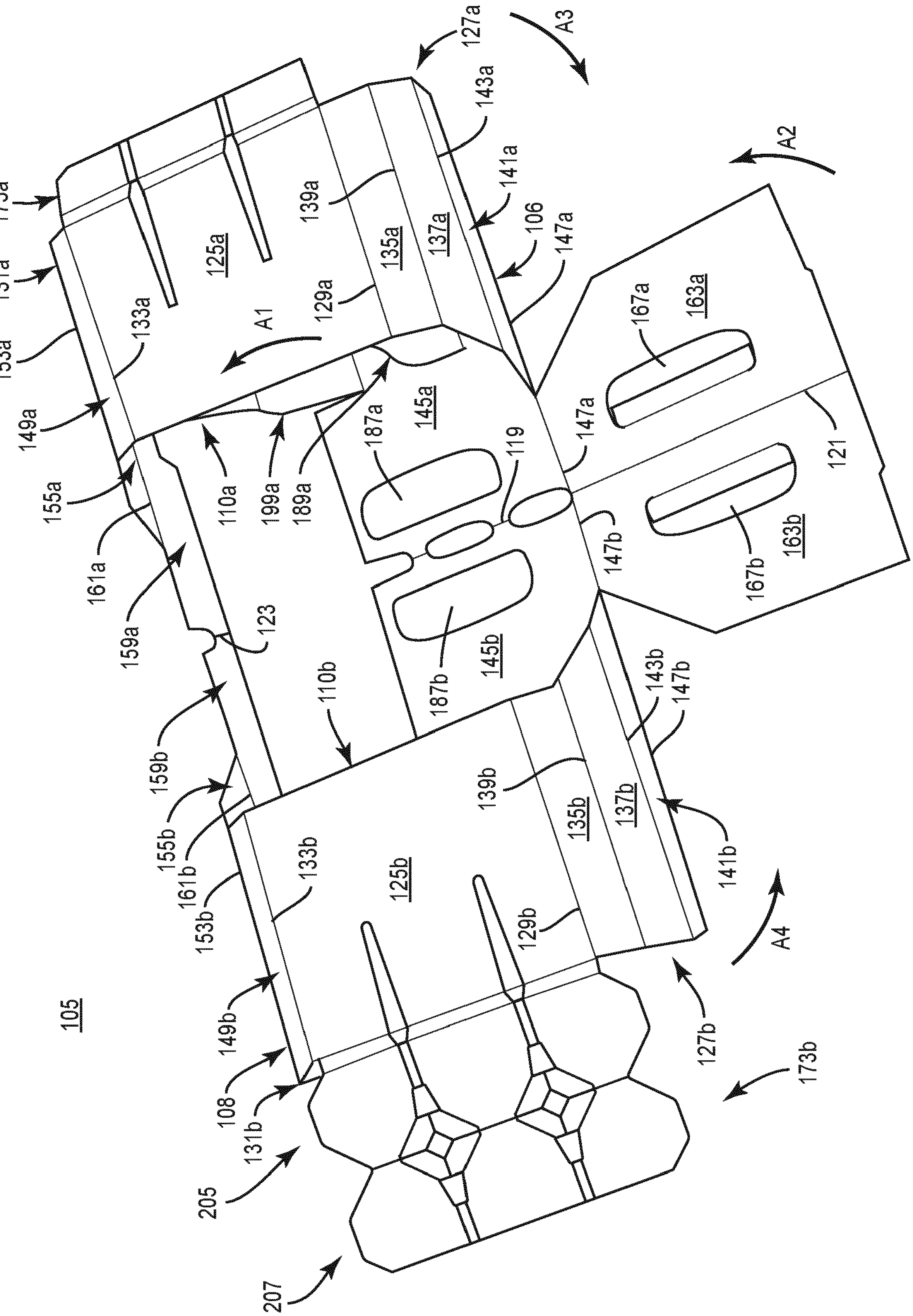
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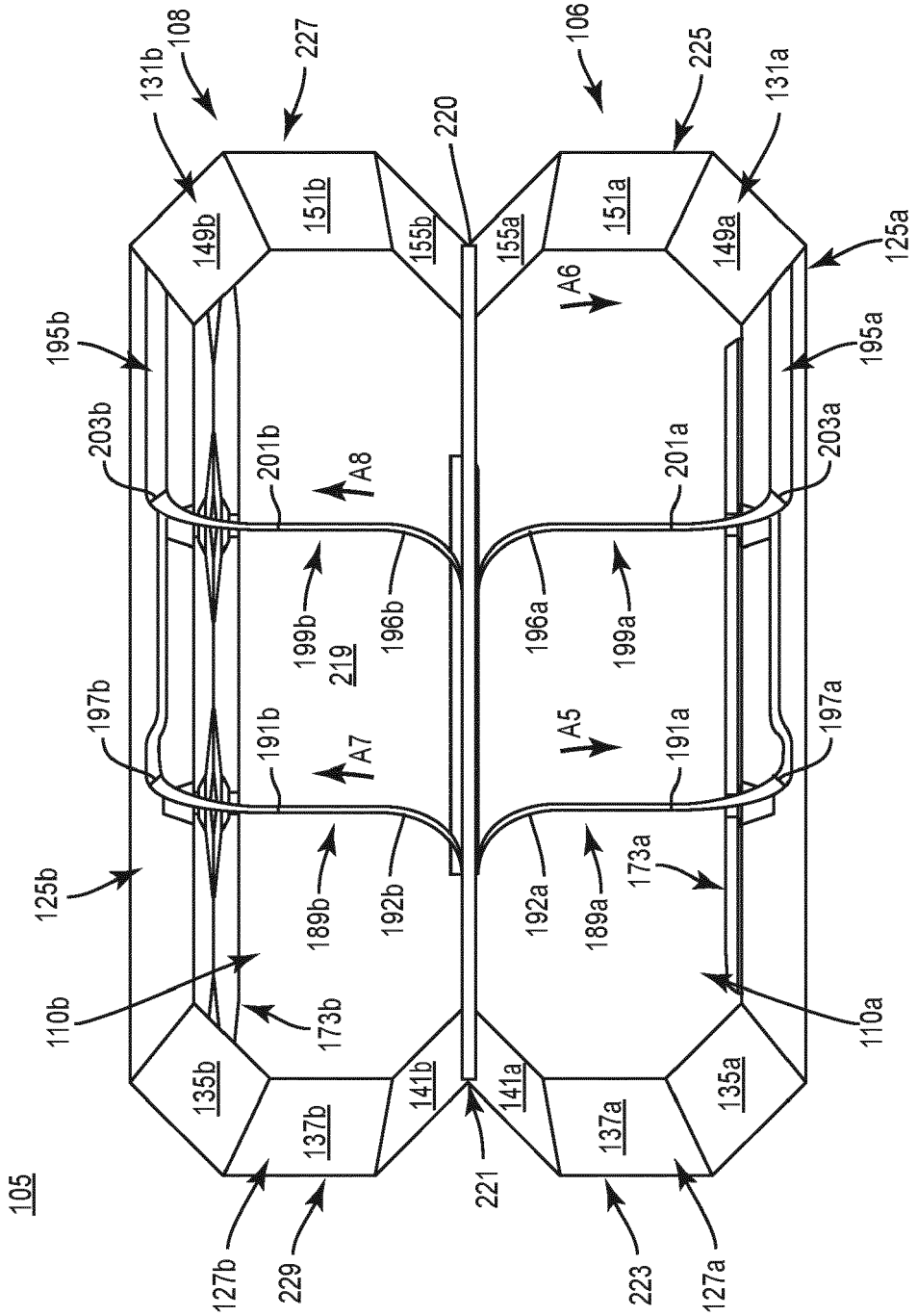
FIG. 2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A5
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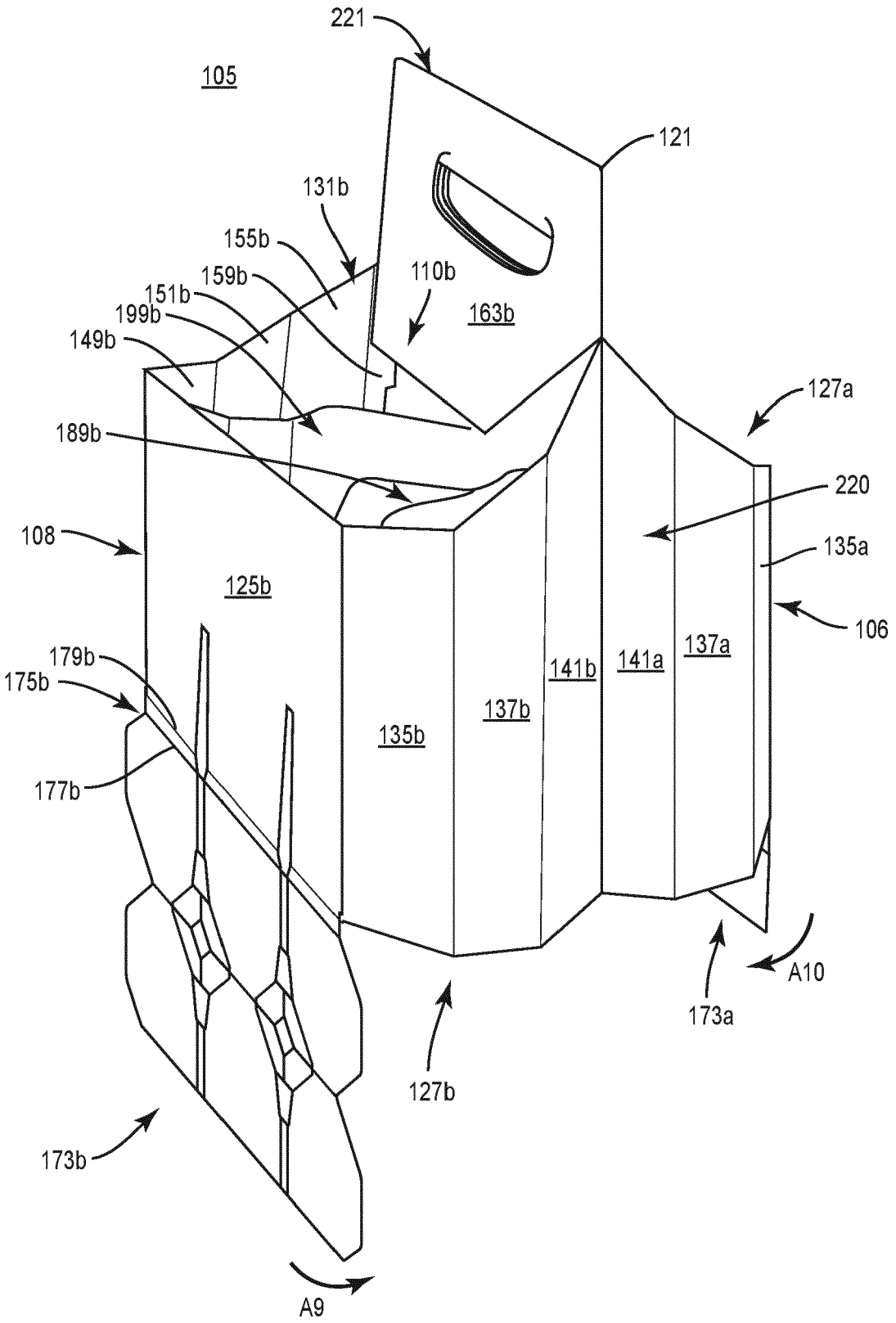
FIG. 3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127b
173b
A9

FIG. 4

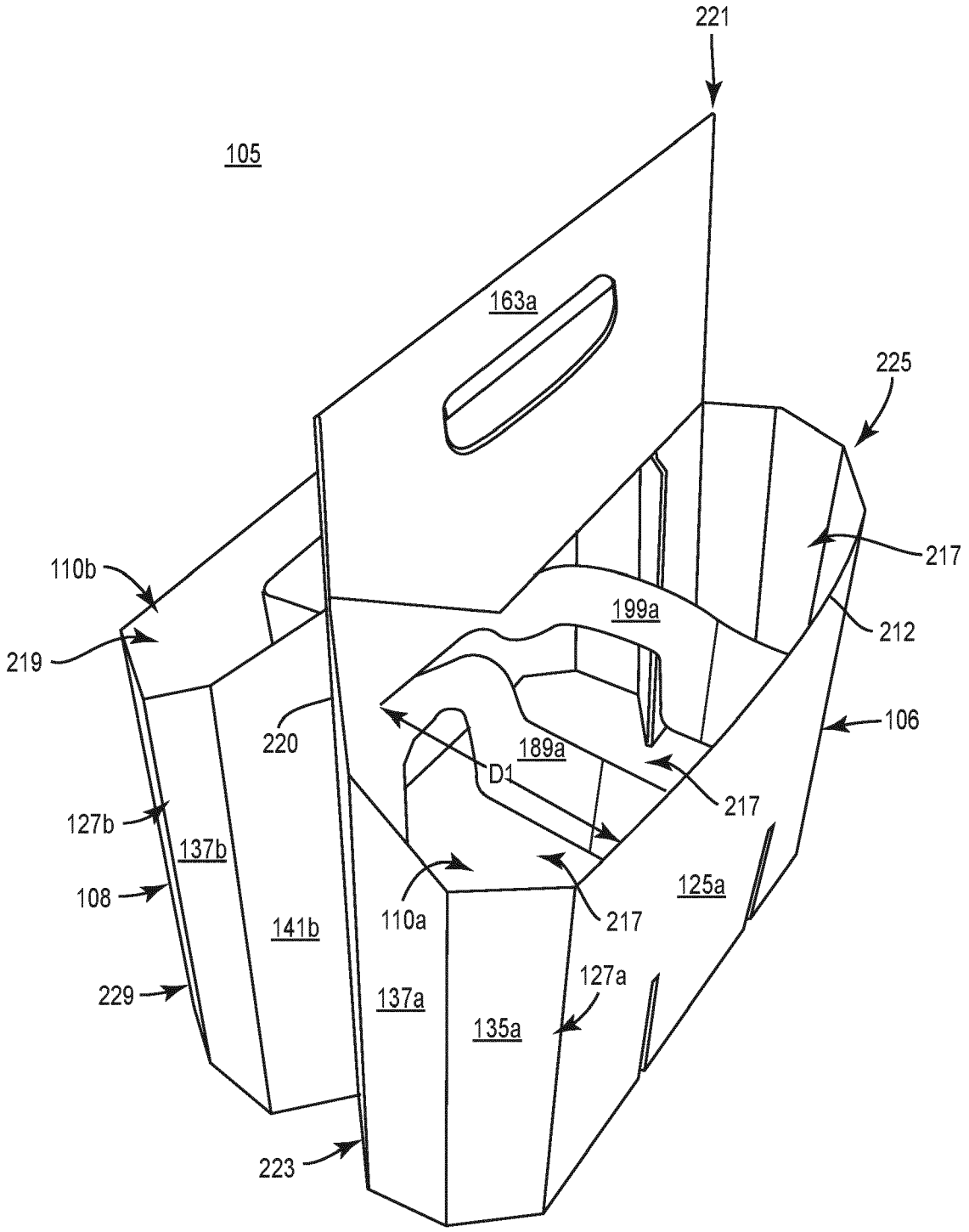
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FIG. 5

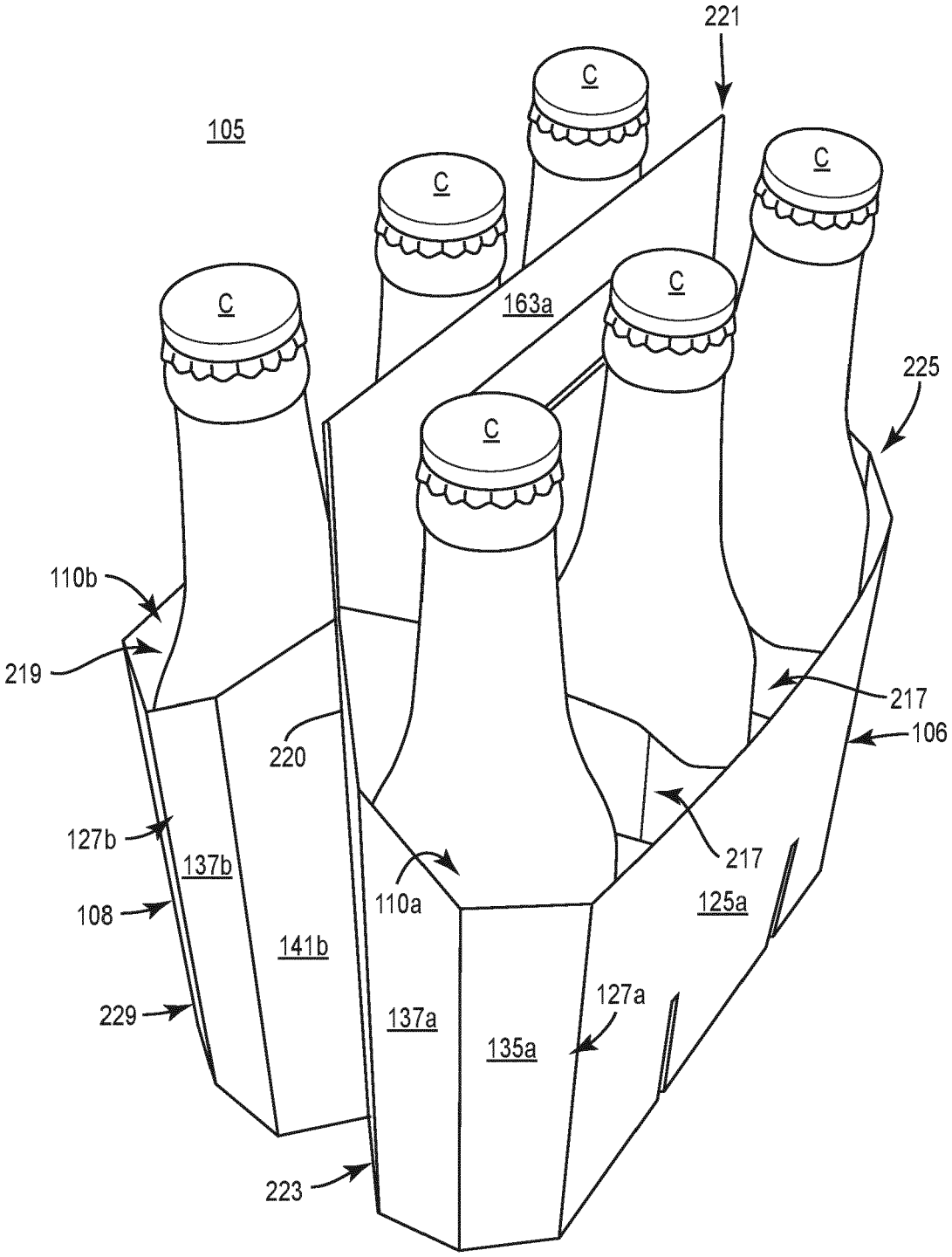
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FIG. 6

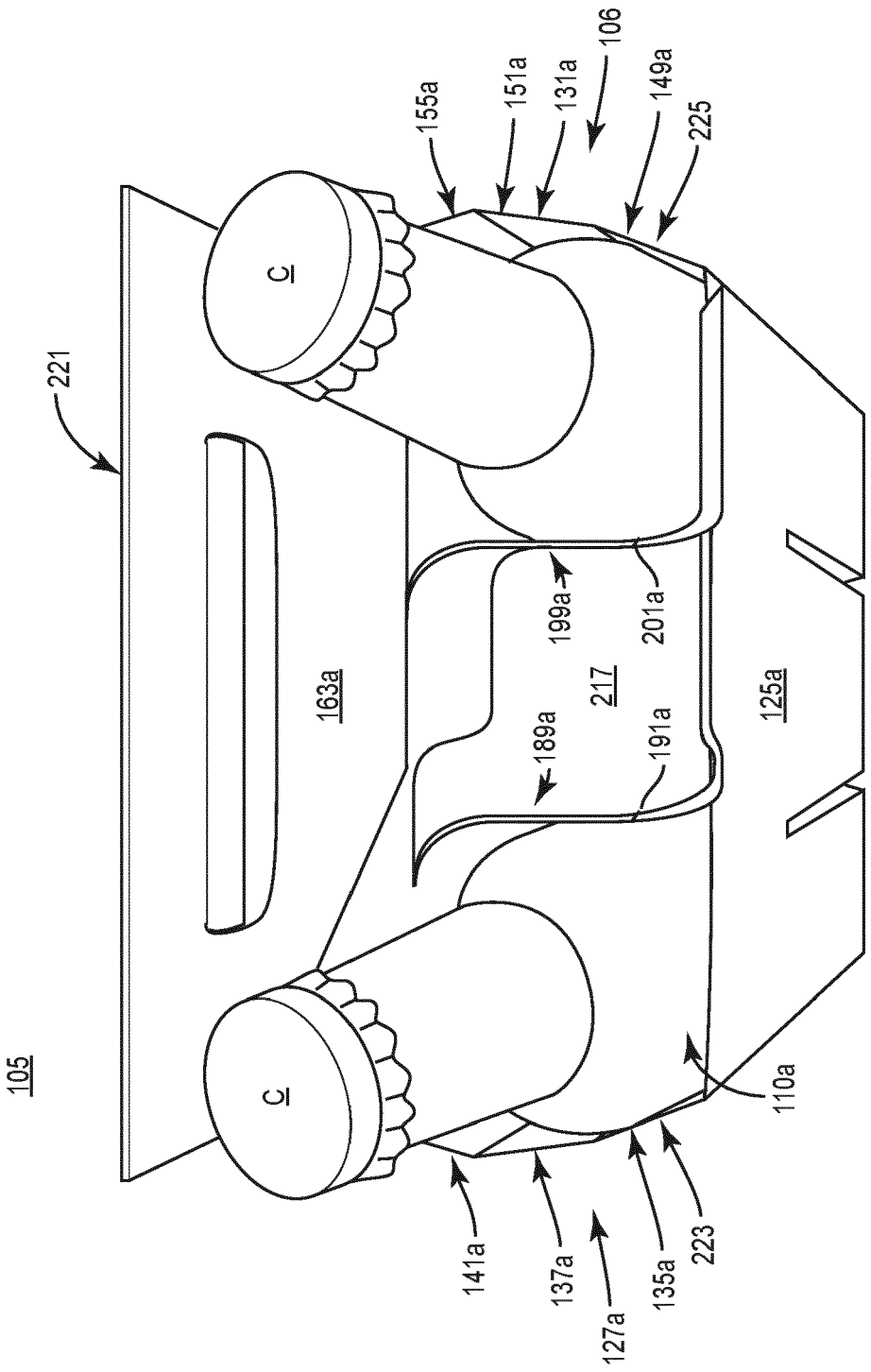
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FIG. 7

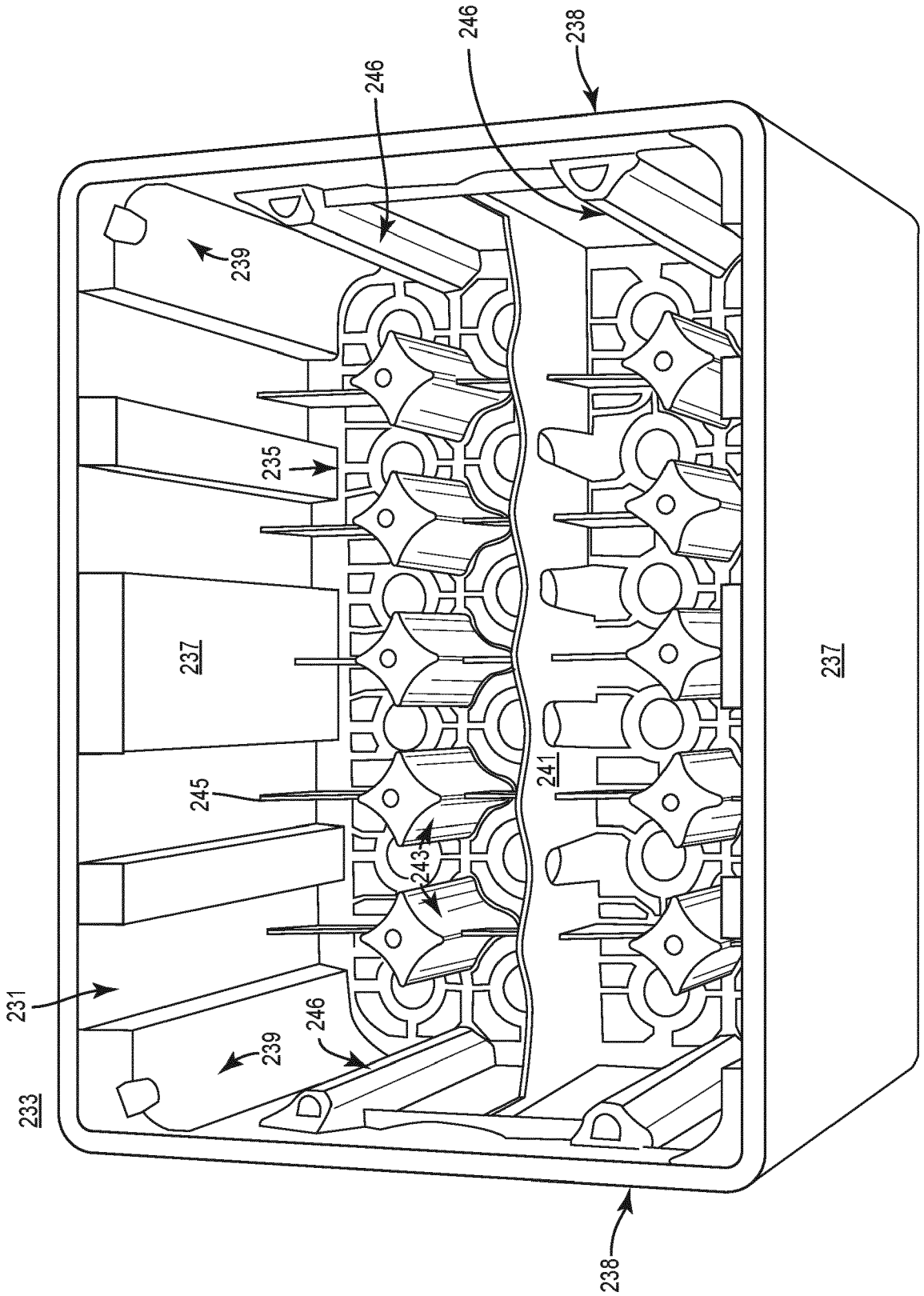
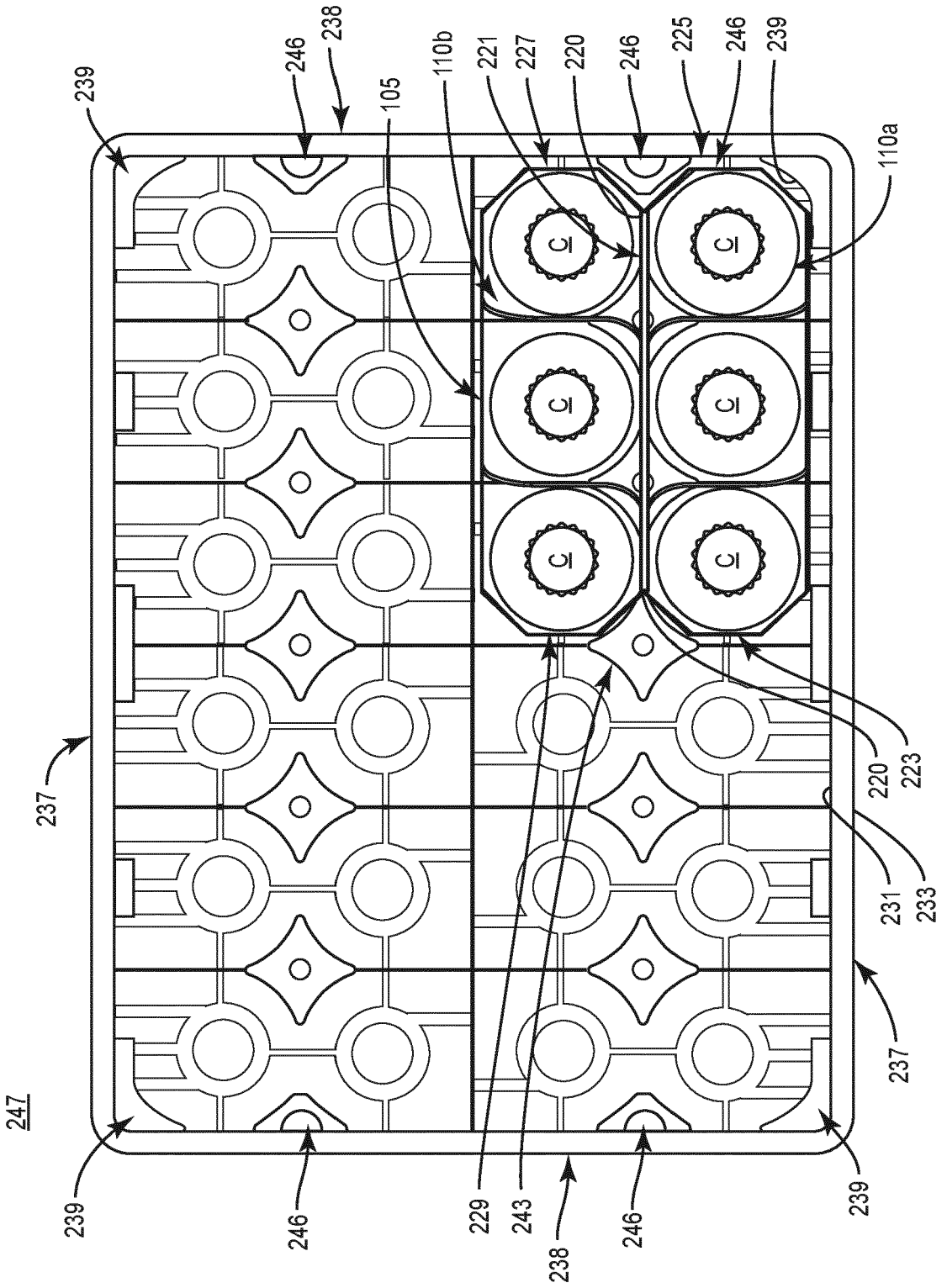


FIG. 8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239

FIG. 9

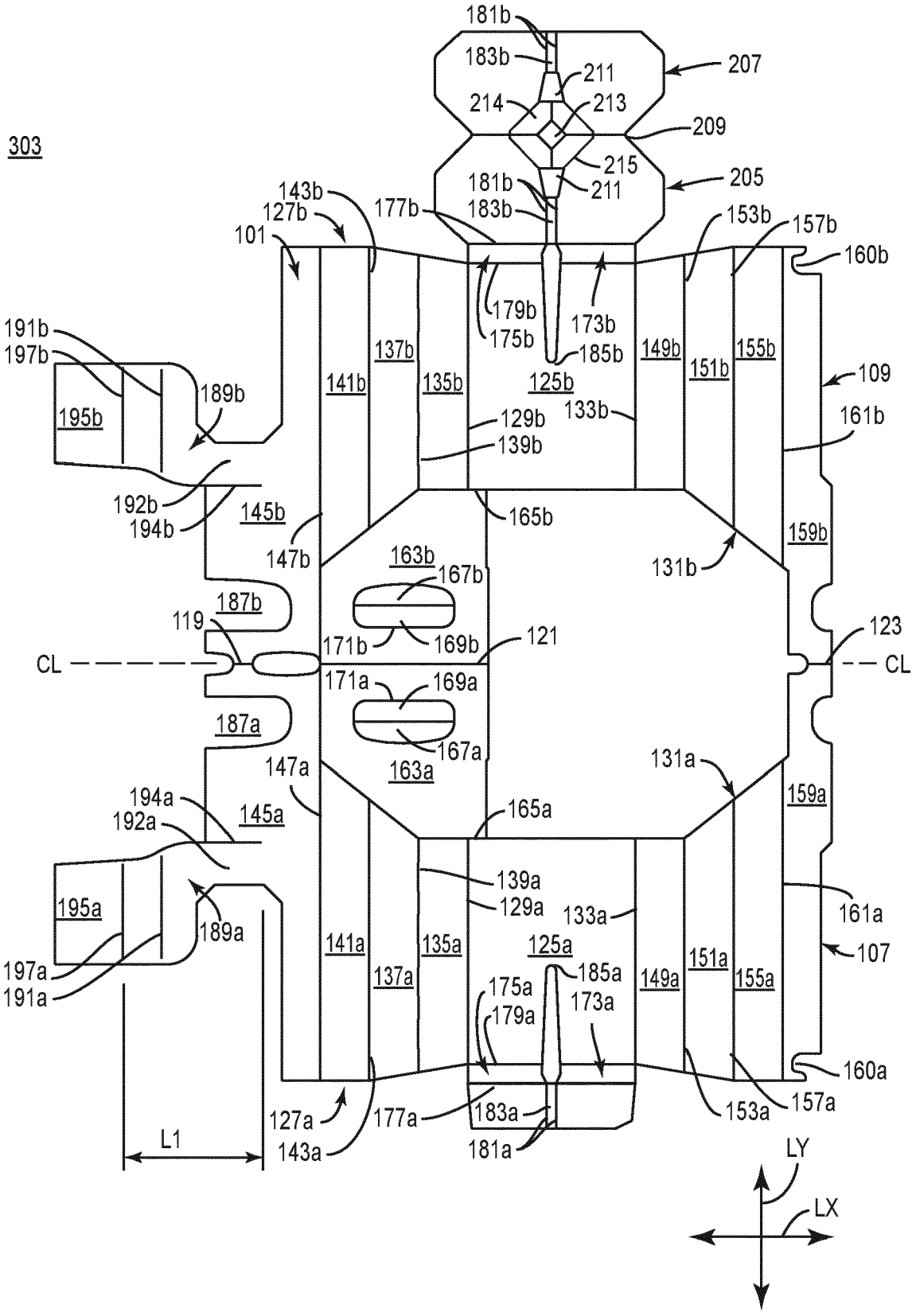
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FIG. 10

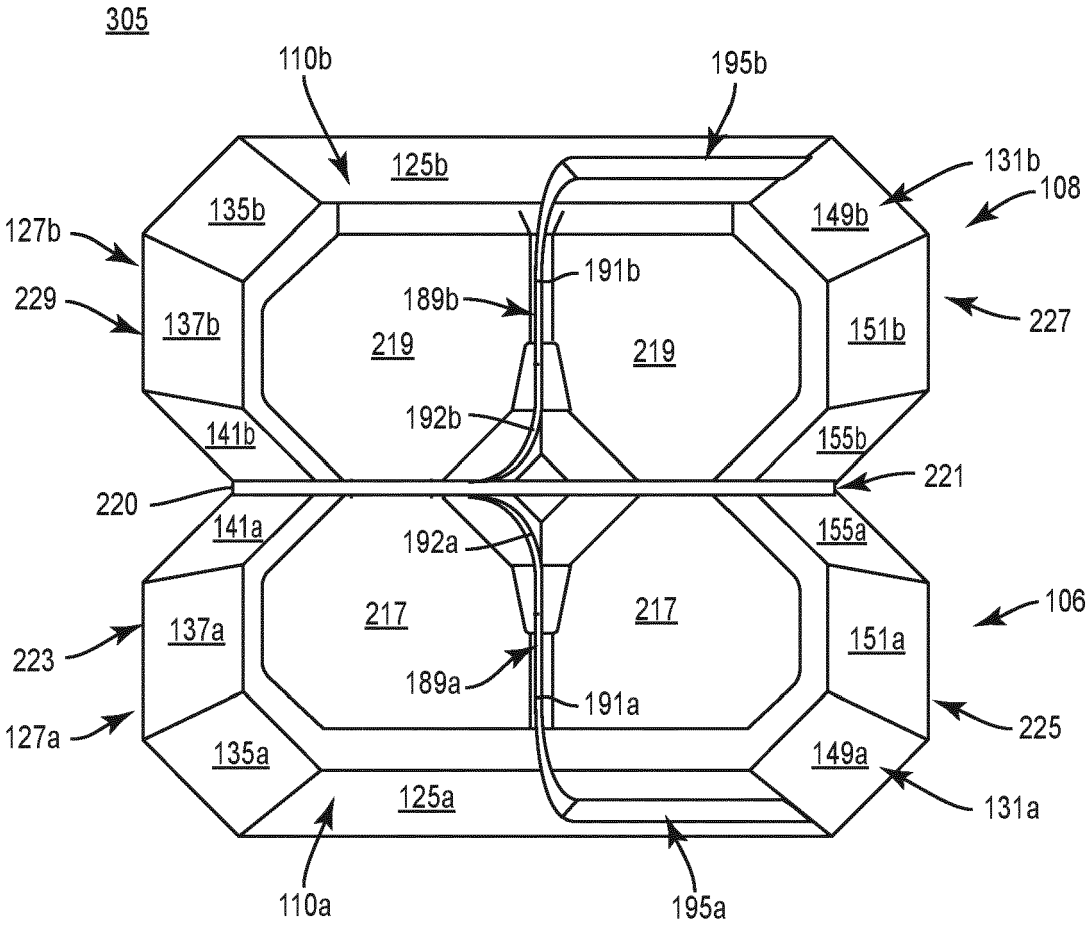
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FIG.11

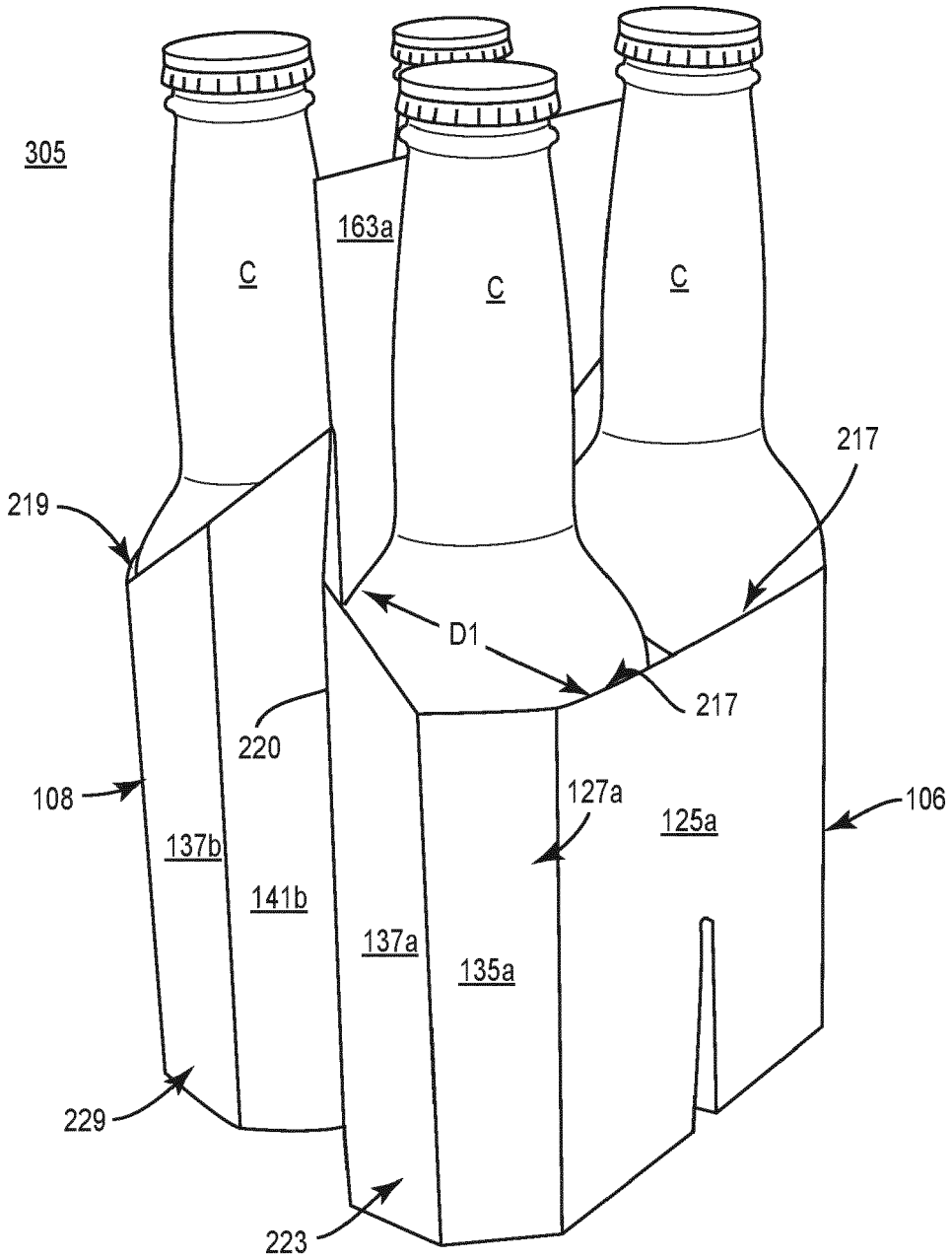
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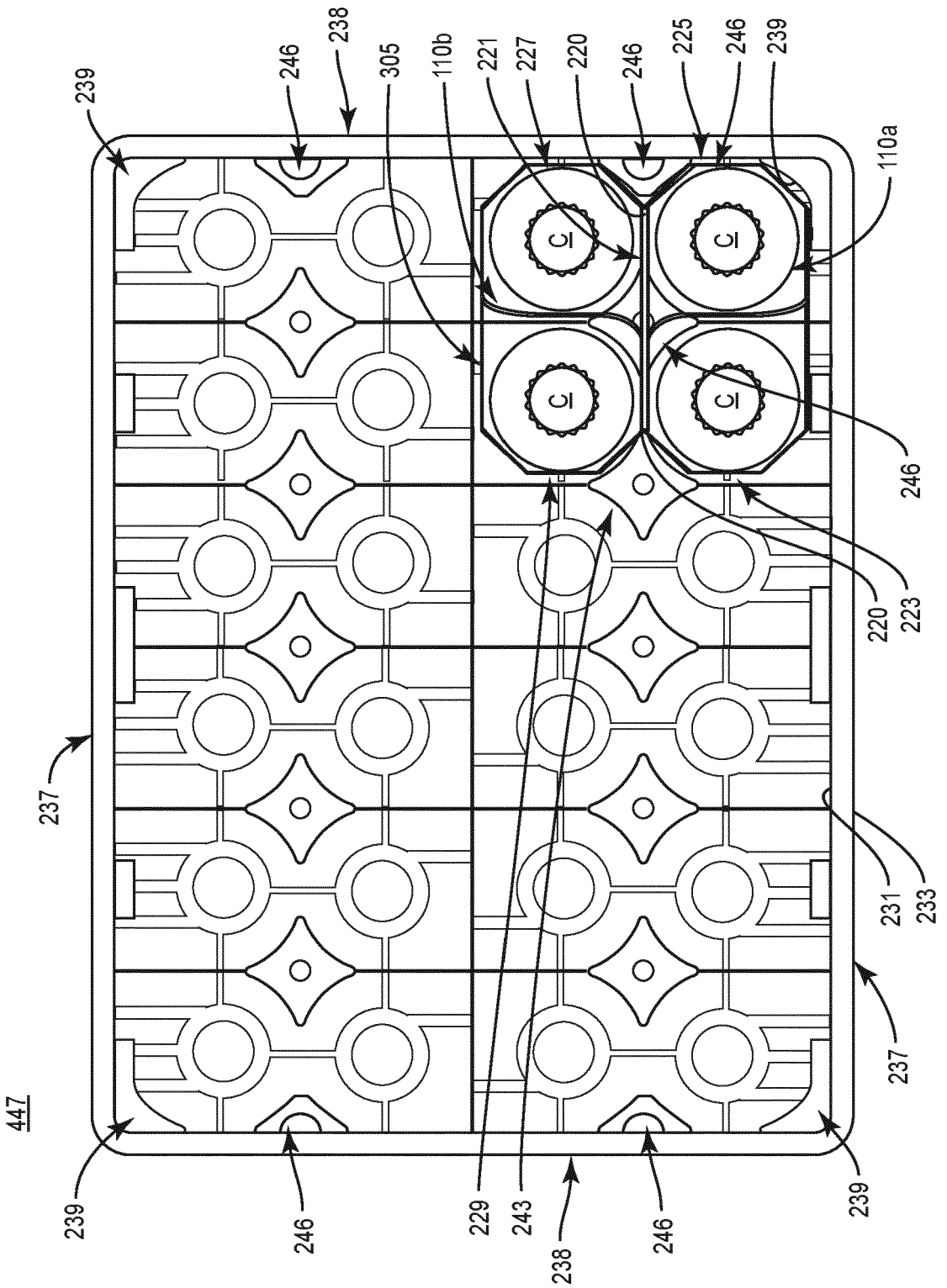
FIG. 12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237

FIG. 13

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EUROPEAN SEARCH REPORT

Application Number
EP 20 21 6023

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	CA 1 229 824 A (SOMERVILLE IND LTD) 1 December 1987 (1987-12-01) * page 2, line 15 - line 16 * * page 2, line 22 - page 3, line 13 * * page 4, line 21 - page 5, line 5; figures 1-7 * -----	1-9	
A	DE 75 03 830 U (EUROPA CARTON AG) 10 July 1975 (1975-07-10) * page 9, line 11 - line 13; figures 1,2 * -----	1-9	
			TECHNICAL FIELDS SEARCHED (IPC) B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 March 2021	Sundell, Olli

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16-03-2021

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		EP 3140217 A1	15-03-2017
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DE 7503830 U	10-07-1975	NONE	

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 62534940 **[0001] [0002]**