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(54) CARRIER FOR CONTAINERS

TRÄGER FÜR BEHÄLTER

SUPPORT POUR RÉCIPIENTS

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Description

BACKGROUND OF THE DISCLOSURE

[0001] The present disclosure generally relates to cartons or carriers for holding, displaying, and/or transporting containers. Such a container is disclosed in US3281180A, for example.

SUMMARY OF THE DISCLOSURE

[0002] According to one aspect of the disclosure, a carrier for holding a plurality of containers is provided according to claim 1.

[0003] According to another aspect of the disclosure, a blank for forming a carrier for holding a plurality of containers is provided according to claim 7.

[0004] According to another aspect of the disclosure, a method of forming a carrier for holding a plurality of containers is provided according to claim 12.

[0005] According to another aspect of the disclosure, a package comprising a plurality of containers is provided according to claim 18.

BRIEF DESCRIPTION OF THE DRAWINGS

[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.

[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.

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

Fig. 2 is a perspective view of a partially folded configuration of a carrier formed from the blank of Fig. 1 according to the first exemplary embodiment.

Fig. 3 is a perspective view of another partially folded configuration of a carrier formed from the blank of Fig. 1 according to the first exemplary embodiment.

Fig. 4 is a front view of a carrier formed from the blank of Fig. 1 according to the first exemplary embodiment and having a container removed therefrom.

Fig. 5 is a rear view of the carrier of Fig. 4 and having a container removed therefrom.

Fig. 6 is a perspective view of another partially folded carrier formed from the blank of Fig. 1 according to the first exemplary embodiment.

Fig. 7 is a perspective view of a package and carrier formed from the blank of Fig. 1 according to the first exemplary embodiment and having access features in a first configuration.

Fig. 8 is a perspective view of the package and carrier of Fig. 7, having access features in a second configuration.

Fig. 9 is another perspective view of the package and carrier of Fig. 7, having one access feature in a second configuration.

Fig. 10 is a perspective view of the package and carrier of Fig. 9 and having a container removed therefrom.

Fig. 11 is a plan view of an outer surface of a blank for forming a carrier and package according to a second exemplary embodiment of the disclosure.

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

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0009] 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.

[0010] 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., aluminum cans) 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.

[0011] As described herein, carriers may be formed by multiple overlapping panels, end flaps, and/or other portions of blanks. Such panels, end flaps, and/or other portions of the blank 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.

[0012] Fig. 1 shows a plan view of an exterior side 101 of a blank 103 used to form a carrier 105 (Fig. 7) in accordance with a first exemplary embodiment of the disclosure. The carrier 105 can be sized to contain or support six containers, with three containers CA1, CA2, CA3 being attached to a front portion 106 of the carrier 105 and three containers CB1, CB2, CB3 being attached to a back portion 108 of the carrier 105. In the illustrated embodiment, the containers CA1, CA2, CA3, CB1, CB2, CB3 can be beverage cans, or 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. In one embodiment, the front portion 106 and the back portion 108 of the carrier 105 each have three containers, and in other embodiments, the front portion 106 and the back portion 108 of the carrier 105 can carry more or less than three containers without departing from the disclosure. The carrier 105 can be provided together with one or more containers as a package 110 (Fig. 7).

[0013] As shown in Fig. 1, the blank 103 has a longitudinal axis L1 and a lateral axis L2. 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. The front portion 107 and the back portion 109 of the blank 103 are foldably connected at a lateral fold line 112 that forms a lateral centerline CL of the blank 103, as shown. As discussed further below, the blank 103 is at least partially formed into the carrier 105 by folding the blank 103 at the fold line 112 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.

[0014] In the illustrated embodiment, the front portion 107 of the blank 103 comprises a front central panel 125a having a first front row RF1 of laterally spaced adhesive or glue openings 127a, and a second front row RF2 of the laterally spaced adhesive or glue openings 127a. The top edges of the respective glue openings 127a of the first row RF1 are spaced a longitudinal distance D1 apart from the fold line 112 that is less than a longitudinal distance D2 that the top edges of the respective glue openings 127a of the second row RF2 are spaced apart from the fold line 112.

[0015] A front container retention panel or front attachment panel 131a is foldably connected to the front central panel 125a at a lateral fold line 133a, and includes a container retention portion 135a that is at least partially defined between a pair of longitudinally-spaced lateral fold lines 137a, 139a (broadly, respective "second fold line") that are each interrupted by respective pairs of longitudinally-spaced cuts 141a that can each include one or more curved and/or angled portions. As shown, the longitudinally-spaced cuts 141a define container retention tabs 148a that extend outwardly from the container retention portion 135a. As also shown, respective oblique cuts 143a, 145a extend outwardly from each respective cut 141a to define a plurality of reconfigurable edges of the front attachment panel 131a that face the respective container retention tabs 148a.

[0016] As shown, an interior marginal portion 136a of the attachment panel 131a is defined between the fold lines 137a, 133a, and an exterior marginal portion 138a of the attachment panel 131a is defined between the fold line 139a and a lateral fold line 171a.

[0017] The blank 103 can include a pair of handle openings 130a that interrupt the fold line 133a and that extend from a portion of the front central panel 125a into a portion of the front attachment panel 131a. As shown, the handle openings 130a can include a longitudinal section 132a extending parallel to the longitudinal axis L1 and a pair of lateral sections 134a that intersect and diverge orthogonally away from the longitudinal section 132a in substantial parallel relation with the lateral axis L2. In this regard, the divergent sections 132a, 134a of the handle opening 130a are in communication with one another. As described further herein, the sections 132a, 134a of the handle opening 130a provide multiple engagement surfaces at which a consumer can grasp the carrier 105, in different orientations. As also shown, a reinforcement flap 126a is foldably connected to the respective attachment panel 131a at a respective curved fold line 140a, and extends into the respective longitudinal section 132a. The carrier 105 can have a different arrangement of handle features, or can be devoid of handle features, without departing from the disclosure.

[0018] The blank 103 additionally includes a bevel or front side panel 169a that is foldably connected to the front attachment panel 131a at the lateral fold line 171a, and a top panel 173 that is foldably connected to the front side panel 169a at a lateral fold line 175a. The top panel 173, as shown, includes additional handle features (broadly, "first handle feature" and "second handle feature") that each include a pair of opposed curved cuts 177, 179 and a longitudinal cut 181 extending from the curved cut 177 to the curved cut 179 to define a pair of handle flaps 183, 185. A pair of longitudinal lines of weakening 187, 189 and a pair of lateral lines of weakening 190, 191 extend along a portion of each flap 183, 185 so as to provide an at least partially reconfigurable arrangement, as described further herein. In one embodiment, one or more of the lines of weakening 187, 189, 190, 191 can be a surface feature such as an emboss or deboss feature. Handle features of the carrier 205 include the handle features in the top panel 173, and can also include the handle openings 130a, 130b. The carrier 105 can have a different arrangement of handle features, or can be devoid of handle features, without departing from the disclosure.

[0019] Still referring to Fig. 1, the top panel 173 additionally includes a pair of laterally-spaced longitudinal fold lines 193, 195 (broadly, "first fold line" and "second fold line", respectively) that define a central portion 197 therebetween, and which further define a first marginal portion 199 of the top panel 173 defined between the fold lines 175a, 193, and a second marginal portion 201 of the

top panel 173 defined between the fold line 195 and a lateral free edge of the top panel 173. In this regard, the first marginal portion 199 of the top panel 173 is defined between the fold line 193 and the front side panel 169a.

[0020] As described further herein, upon formation of the carrier 105, the central portion 197 of the top panel 173 is positioned to generally overlap and align with respective portions of the container retention portion 135a of the front attachment panel 131a and a container retention portion 135b of a back attachment panel 131b, the first marginal portion 199 of the top panel 173 is positioned to generally align with an exterior marginal portion 138b of the back attachment panel 131b, and the second marginal portion 201 of the top panel 173 is positioned to generally align with the exterior marginal portion 138a of the front attachment panel 131a.

[0021] In the illustrated embodiment, the back portion 109 of the blank 103 includes a back central panel 125b and the back container retention panel or back attachment panel 131b having associated features that are generally a mirror-image of the corresponding panels and flaps of the front portion 107 of the blank 103. 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. The back portion 109 of the blank 103 additionally includes a back side panel 169b foldably connected to the back attachment panel 131b at a lateral fold line 171b, and an attachment flap 213 foldably connected to the back side panel 169b at a lateral fold line 175b.

[0022] As shown, a pair of generally U-shaped cuts 157 extend from the centerline CL and have a respective lateral portion that defines the top edge of respective glue openings 127b of a first back lateral row RB1 of laterally spaced glue openings 127b. As shown, the top edges of the respective glue openings 127b of the first lateral row RB1 of glue openings 127b are spaced a longitudinal distance D3 apart from the fold line 112 that is less than a longitudinal distance D4 that the top edges of respective glue openings 127b of a second back lateral row RB2 of glue openings 127b are spaced apart from the fold line 112.

[0023] In this regard, the blank 103 is provided with front rows RF1 and RF2 of laterally-spaced front glue openings 127a that are spaced respective longitudinal distances D1, D2 from the centerline CL, and back rows RB1 and RB2 of laterally-spaced back glue openings 127b that are spaced respective longitudinal distances D3, D4 from the centerline CL. The glue openings 127a, 127b have a longitudinally staggered arrangement such that D2 > D4 > D1 > D3. Upon formation of the carrier 105 from the blank 103, the longitudinal centerline CL/fold line 112 can form a bottom edge of the central panels 125a, 125b.

[0024] As described herein, the arrangement of the glue openings 127a, 127b is such that, upon erection of the carrier 105, the glue openings 127a, 127b provide access to a respective plurality of surfaces of the respective central panels 125b, 125a upon which the respective containers CA1, CA2, CA3, CB1, CB2, CB3 can be attached to enhance retention and support of the containers CA1, CA2, CA3, CB1, CB2, CB3 by the carrier 105.

[0025] 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 four containers without departing from this disclosure.

[0026] As shown in Fig. 2, an interior surface or underside of the blank 103 can be placed atop the containers CA1, CA2, CA3, CB1, CB2, CB3 such that the container retention portion 135a of the front attachment panel 131a overlies the containers CA1, CA2, CA3 and such that the container retention portion 135b of the back attachment panel 131b overlies the containers CB1, CB2, CB3. Further downward positioning of the attachment panels 131a, 131b over the plurality of containers CA1, CA2, CA3, CB1, CB2, CB3 can activate the respective container retention portions 135a, 135b to engage respective containers. For example, as the front attachment panel 131a is lowered or urged downwardly onto the containers CA1, CA2, CA3, the container retention portion 135a can at least partially separate from the remainder of the front attachment panel 131a at the cuts 141a. In such an arrangement, upper or top portions T of the respective containers CA1, CA2, CA3 can extend at least partially through respective openings formed by the respective cuts 141a such that the container retention tabs 148a can engage, for example, a recessed portion of a rim or other top structure of the respective container CA1, CA2, CA3, and such that a plurality of reconfigurable edges of the marginal portions 136a, 138a can engage, for example, a rolled rim edge or other top structure of the respective container CA1, CA2, CA3.

[0027] Such reconfiguration of the corresponding portions of the back attachment panel 131b can occur as the back attachment panel 131b is lowed or urged downwardly onto the containers CB1, CB2, CB3. During the above-described engagement of the respective container retention portions 135a, 135b with the respective containers, the marginal portions 136a, 138a of the attachment panel 131a can fold at least partially downwardly at the respective fold lines 137a, 139a in such a configuration, and, similarly, the marginal portions 136b, 138b of the attachment panel 131b can fold at least partially downwardly at the respective fold lines 137b, 139b.

[0028] Referring additionally to Fig. 3, the front central panel 125a and the back central panel 125b can be folded at the fold line 112 such that the front central panel 125a and the back central panel 125b are brought into at least partial face-to-face contact in the direction of the arrows A1, A2 to be positioned between respective adjacent

containers and such that the respective glue openings 127a, 127b are positioned so as to be laterally aligned but longitudinally offset due to the different relative spacing of the respective rows RF1, RF2 of the front glue openings 127a and the respective rows RB1, RB2 of the back glue openings 127b away from the fold line 112 as described above.

[0029] In this regard, the central panels 125a, 125b are arranged such that a portion of the front central panel 125a overlaps each of the glue openings 127b and a portion of the back central panel 125b overlaps each of the glue openings 127a to provide communication between the central panels 125a, 125b and respective surfaces upon which the respective containers CA1, CA2, CA3, CB1, CB2, CB3 can be adhered or otherwise attached, as described further herein. Such rearrangement of the central panels 125a, 125b can also cause the respective central panels 125a, 125b to be folded downwardly relative to the respective attachment panels 131a, 131b at the respective fold lines 133a, 133b.

[0030] Referring to Figs. 4 and 5, in which the respective containers CA3, CB1 are removed for clarity of illustration, an adhesive glue G can be provided to adhere the containers CA1, CA2, CA3 to respective portions of the central panel 125b exposed through the respective glue openings 127a, and the glue G can be provided to adhere the containers CB1, CB2, CB3 to respective portions of the central panel 125a exposed through the respective glue openings 127b. The arrangement of multiple rows of respective glue openings 127a, 127b provides multiple points of attachment of each respective container to the respective opposite central panel 125a, 125b such that each container is provided with a robust attachment to a respective central panel 125a, 125b. The attachment of the containers CA1, CA2, CA3, and containers CB1, CB2, CB3 to the respective central panel 125a, 125b can provide retention and support of the respective containers, e.g., such that the containers do not detach from the carrier 105 under their own weight, in addition to or alternative to the container retention and support provided by the respective container retention portions 135a, 135b. For example, in one embodiment, one or more of the containers CA1, CA2, CA3, CB1, CB2, CB3 can be attached to a respective central panel 125a, 125b with glue G, without additional retention and support provided by a container retention portion as described above.

[0031] The glue G described herein can be, for example, a hot melt adhesive, a high tack glue, an epoxy, a polymeric cement, etc., or combinations thereof. The glue G can have a different arrangement without departing from the disclosure. For example, in one embodiment, the glue G can be applied to one or more portions of the exterior surface of the blank 103/carrier 105.

[0032] Such enhanced attachment of the respective containers to the respective central panels 125a, 125b with the glue G can also provide enhanced integrity to the carrier 105, e.g., by providing opposing adhesive forces on the respective central panels 125a, 125b such that the central panels 125a, 125b are compressed therebetween. For example, in one embodiment, as the carrier 105 is lifted, the containers CA1, CA2, CA3 can at least partially pull the portions of the back central panel 125b to which they are attached through the respective glue openings 127a toward the front central panel 125a under the at least partial weight of the containers CA1, CA2, CA3. Respective portions of the front central panel 125a can be pulled toward the back central panel 125b through the respective glue openings 127b by the containers CB1, CB2, CB3 in a similar manner.

[0033] Referring to Figs. 6 and 7, the front side panel 169a can be folded upwardly at the fold line 171a, for example, to be at an oblique arrangement relative to the containers CA1, CA2, CB1, CB2, CB3 and the top panel 173 can be folded at the fold line 175a generally in the direction of the arrow A3 into at least partial face-to-face contact with at least a portion of the attachment panels 131a, 131b. Similarly, the back side panel 169b can be folded upwardly at the fold line 171b into an oblique arrangement with the containers CA1, CA2, CA3, CB1, CB2, CB3 and the attachment flap 213 can be folded at the fold line 175b generally in the direction of the arrow A4 into at least partial face-to-face contact with the top panel 173 and/or the attachment panel 131b. Such an arrangement can be maintained with an adhesive such as glue.

[0034] The respective handle flaps 183, 185 can be at least partially separated from the top panel 173 at the respective cuts 177, 179, and from each other at the respective cuts 181, and folded or flexed downwardly into an interior portion of the carrier 105/package 110. The handle openings 130a, 130b provide clearance for the handle flaps 183, 185 to extend downwardly in such an arrangement. In one embodiment, one or both of the handle flaps 183, 185 can be provided with a reconfigurable arrangement, for example, so as to contour or angle against one or more of the respective containers CA1, CA2, CA3, CB1, CB2, CB3, e.g., such that at least a central portion of the respective handle flaps 183, 185 can be positioned between adjacent containers.

[0035] In one embodiment, marginal portions of the respective handle flaps 183, 185 can at least partially wrap around or surround a consumer's finger, for example, to minimize or prevent contact of the consumer's finger with edges or corners of the carrier 105/package 110 and/or the respective containers. In addition, and as described above, the divergent nature of the respective longitudinal sections 132a, 132b and the respective lateral sections 134a, 134b of the respective handle openings 130a, 130b allows a consumer multiple edges and surfaces by which to engage and lift the carrier 105 such that the consumer can engage the carrier from multiple orientations, e.g., a lateral orientation or a longitudinal orientation, or orientations therebetween.

[0036] Should the handle openings 130a, 130b be engaged at the edges of the respective longitudinal sections 132a, 132b, the respective reinforcement flaps

126a, 126b can at least partially fold downwardly at the respective curved fold lines 138a, 138b to provide additional reinforcing structure between a customer's fingers and the respective attachment panel 131a, 131b, e.g., in a three-ply configuration.

[0037] Referring additionally to Figs. 8-10, an at least partial reconfiguration of the carrier 105 to facilitate removal of one or more of the containers CA1, CA2, CA3, CB1, CB2, CB3 will be described in accordance with an exemplary embodiment of the disclosure.

[0038] As shown in Figs. 7 and 8, one or both of the first marginal portion 199 and the second marginal portion 201 of the top panel 173 can be folded at least partially upwardly at the respective fold lines 193, 195. Upward movement of the first marginal portion 199 can carry the front panel 169a and the exterior marginal portion 138a of the front attachment panel 131a therewith such that the first marginal portion 199, the front panel 169a, and the exterior marginal portion 138a can together form an articulable access feature 205 (broadly, "first access feature") that provides at least partial access to the containers CA1, CA2, CA3 in the front portion 106 of the carrier 105. Similarly, the second marginal portion 201 of the top panel 173, the attachment flap 213 underlapped on the marginal portion 201, the back panel 169b, and the exterior marginal portion 138a can together form an articulable access feature 207 (broadly, "second access feature") that provides at least partial access to the containers CB1, CB2, CB3 in the back portion 108 of the carrier 105.

[0039] For example, the access feature 205 can be grasped by a customer, for example, by curling his or her fingers around portions of the first marginal portion 199 of the top panel 173, the front panel 169a, and/or the exterior marginal portion 138a of the attachment panel 131a, and lifting upwardly such that these panels/portions articulate to fold at least partially at the aligned fold lines 193, 139a in the respective top panel 173 and attachment panel 131a. In one embodiment, the fold lines 193, 139a can be positioned in an offset relationship.

[0040] Such movement of the access feature 205 can cause at least partial disengagement of one or more of the containers CA1, CA2, CA3 from the attachment panel 131a, for example, by withdrawing the top portion T of a respective container through an opening formed by a respective cut 141a along the respective attachment panel 131a.

[0041] Similarly, the access feature 207 can be grasped by a customer by curling his or her fingers around portions of the second marginal portion 201 of the top panel 173, the back panel 169b, and/or the exterior marginal portion 138a and lifting upwardly at the aligned fold lines 195, 139b in the respective top panel 173 and attachment panel 131a to provide access to the containers CB1, CB2, CB3 in the back portion 108 of the carrier 105. Such movement of the access feature 207 can cause at least partial disengagement of one or more of the containers CB1, CB2, CB3 from the attachment panel 131b as described above with respect to the containers CA1, CA2, CA3. In one embodiment, the fold lines 195, 139b can be positioned in an offset relationship.

[0042] Accordingly, the access features 205, 207 are each reconfigurable/positionable between a first configuration/position, in which one or both of the marginal portions 199, 201 of the top panel 173 are generally perpendicular to the central panels 125a, 125b, and a second configuration/position, in which one or both of the marginal portions 199, 201 of the top panel 173 are generally raised or upright relative to the central panels 125a, 125b, e.g., such that the marginal portions 199, 201 are parallel with or obliquely-disposed relative to the central panels 125a, 125b, for example, to allow access to the containers. In the second configuration of the access features 205, 207, at least the respective marginal portions 138a, 138b of the respective attachment panels 135a, 135b can also be generally raised or upright relative to the central panels 125a, 125b.

[0043] In one embodiment, the respective marginal portions 138a, 138b of the respective attachment panels 135a, 135b can be considered to be generally perpendicular to the central panels 125a, 125b when the access features 205, 207 are in the first configuration/position.

[0044] It will be understood that the access features 205, 207 can each be reconfigured/positioned from the second configuration/position by reversing the movement of the access features 205, 207 described above. For example, the access features 205, 207 can be folded at least partially downwardly at the respective fold lines 193, 139a and fold lines 195, 139b toward a generally perpendicular arrangement relative to the central panels 125a, 125b. Such movement of the access features 205, 207 can cause at least partial re-engagement of one or more of the containers CA1, CA2, CA3 and CB1, CB2, CB3 with the respective attachment panels 131a, 131b as described above.

[0045] As shown in Figs. 9 and 10, in which only the second access feature 207 is shown in the second configuration/position, a respective container CA1, CA2, CA3, CB1, CB2, CB3 can be further removed from the carrier 105 by peeling the respective container away from the respective central panel 125a, 125b. Peeling or pulling the containers CA1, CA2, CA3, CB1, CB2, CB3 away from a respective central panel 125a, 125b can involve pulling the respective container with a force sufficient to overcome the adhesive bond of the respective container and the respective central panel 125a, 125b provided by the glue G. In one embodiment, the glue G can be selected so as to remain on a respective central panel 125a, 125b, e.g., such that substantially little or no glue G remains on the container as it is removed.

[0046] One or more of the containers CA1, CA2, CA3, CB1, CB2, CB3 in one embodiment, can be reattached to a respective central panel 125a, 125b following therefrom by pressing the container against a respective region of glue G.

[0047] It will be understood that a different number of rows or arrangements of glue openings can be provided without departing from the disclosure, and that the central panels can be sized and configured to accommodate such arrangements. In one embodiment, the central panels 125a, 125b can be devoid of glue openings such that the respective containers CA1, CA2, CA3 and CB1, CB2, CB3 are adhered only to the respective central panel 125a, 125b. In another embodiment, glue G can be provided both on portions of the respective central panels 125a, 125b exposed through the respective glue openings 127b, 127a as well as portions of the respective central panels 125a, 125b adjacent the respective glue openings 127a, 127b such that each container CA1, CA2, CA3, CB1, CB2, CB3 can be adhered to portions of both central panels 125a, 125b.

[0048] The carrier 105/package 110 described above has a compact structure that can, for example, provide materials savings and waste reduction. Additionally, the arrangement of the glue G among the containers CA1, CA2, CA3, CB1, CB2, CB3 as well as the central panels 125a, 125b provides multiple points of attachment that results in a robust structure for holding and carrying the containers CA1, CA2, CA3, CB1, CB2, CB3. Further, the exposure of one or more portions of the containers CA1, CA2, CA3 CB1, CB2, CB3 on exterior portions of the carrier 105/package 110 provides a consumer with a clear view of labeling or surface graphics associated with the containers CA1, CA2, CA3, CB1, CB2, CB3, as well as providing convenient access to remove one or more of the containers CA1, CA2, CA3, CB1, CB2, CB3 from the carrier 105/package 110.

[0049] Referring additionally to Fig. 11, a blank 203 for forming a carrier 205 according to a second exemplary embodiment of the disclosure is illustrated. The blank 203 and the carrier 205 can have one or more features that are similar to those of the blank 103 and the carrier 105 of the first exemplary embodiment, and like or similar reference numbers refer to like or similar features.

[0050] As shown, the attachment panels 131a, 131b of the blank 203 are each provided with a respective three laterally spaced cuts 141a, 141b such that the carrier 205 is sized and configured to support and retain six containers, with three containers CA1, CA2, CA3 in a front portion 206 of the carrier 205 and three containers CB1, CB2, CB3 in a back portion 208 of the carrier 205.

[0051] As also shown, the U-shaped cuts 157 interrupt the fold line 112 to define respective tabs 159 extending away from the centerline CL. Upon formation of a carrier from the blank 203, the tabs 159 can separate from the surrounding material of the central panel 125b at the respective cuts 157 to expose a pair of glue openings 127b of the first back row RB1.

[0052] It will be understood that the blanks and carriers described herein can be provided in different configurations without departing from the disclosure.

[0053] 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.

[0054] As described herein, a line of weakening can include one or more of tear lines, cut lines, etc. 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.

[0055] 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.

[0056] 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.

[0057] 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 scope of the appended claims. 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 invention, which is solely defined by the appended claims.

Claims

1. A carrier (105) for holding a plurality of containers (CA1, CA2, CA3, CB1, CB2, CB3), the carrier comprising:

a plurality of panels comprising a top panel (173), at least one central panel (125a, 125b), and at least one attachment panel (131a, 131b) configured to receive a portion of one or more containers of the plurality of containers, the at least one central panel is for being positioned between and attached to adjacent containers of the plurality of containers; and

at least one access feature (205) that is positionable for allowing access to at least one container of the plurality of containers, the at least one access feature comprises a marginal portion (199, 201) of the top panel and a marginal portion (138a, 138b) of the at least one attachment panel,

the at least one central panel comprises a front central panel (125a), and a back central panel (125b) in face-to-face contact with the front central panel, the at least one attachment panel comprises a front attachment panel (131a) foldably connected to the front central panel (125a) and a back attachment panel (131b) foldably connected to the back central panel (125b),

characterized in that

each of the front central panel and the back central panel has a

first row (RF1) of openings (127a, 127b) and a second row (RF2) of openings (127a, 127b) spaced apart from the first row of openings,

the first row of openings is spaced a first distance (D1) from a bottom edge of the at least one central panel, and the second row of openings is spaced a second distance (D2) from the bottom edge of the at least one central panel, the second distance is greater than the first distance such that the openings (127a) in the front central panel (125a) are in communication with the back central panel (125b) and the openings (127b) in the back central panel are in communication with the front central panel for providing respective points of attachment for each respective container to the respective opposite central panel.

2. The carrier (105) of claim 1, wherein the at least one central panel (125a, 125b) is for being adhered to adjacent containers of the plurality of containers (CA1, CA2, CA3, Cb1, CB2, CB3).

3. The carrier (105) of claim 1, wherein the at least one access feature (205) is reconfigurable between a first configuration in which the marginal portion (199) of the top panel (173) is generally perpendicular to the at least one central panel (125a, 125b), and a second configuration in which the marginal portion of the top panel and the marginal portion (138a, 138b) of the at least one attachment panel (131a, 131b) are raised to allow access to at least one container of the plurality of containers.

4. The carrier (105) of claim 3, wherein the at least one access feature (205) further comprises a side panel (169a) foldably connected to the marginal portion (199) of the top panel (173) and the marginal portion (138a) of the at least one attachment panel (131a) and the marginal portion of the top panel overlaps the marginal portion of the at least one attachment panel.

5. The carrier (105) of claim 3, wherein the at least one access feature (205) further comprises a side panel (169a) foldably connected to the marginal portion (199) of the top panel (173) and the marginal portion (138a) of the at least one attachment panel (131a) and the marginal portion of the top panel is a first marginal portion (199) of the top panel and the carrier further comprises a second marginal portion (201) of the top panel, the side panel is a front side panel (169a) and the carrier further comprises a back side panel (169b) foldably connected to the back attachment panel (131b), the top panel comprises a central portion (197), the at least one access feature is a first access feature (205) foldably connected to the central portion of the top panel at a first fold line (193), and the carrier further comprises a second access feature (207) comprising the second marginal portion (201) of the top panel and a marginal portion (138b) of the back attachment panel, the second access feature is foldably connected to the central portion of the top panel at a second fold line (195).

6. The carrier (105) of claim 1, wherein at least one of the at least one central panel (125a, 125b) and the at least one attachment panel (131a, 131b) includes at

least one handle opening (130a, 130b), the top panel (173) comprises at least one handle feature (183, 185), the at least one handle feature is aligned with the at least one handle opening.

7. A blank (103) for forming a carrier (105) for holding a plurality of containers (CA1, CA2, CA3, CB1, CB2, CB3), the blank comprising:

a plurality of panels comprising a top panel (173), at least one central panel (125a, 125b), and at least one attachment panel (131a, 131b), and

at least one access feature (205) comprising a marginal portion (199, 201) of the top panel and a marginal portion (138a, 138b) of the at least one attachment panel, the at least one access feature is for being positionable for allowing access to at least one container of the plurality of containers when the carrier is formed from the blank,

the at least one central panel is for being positioned between and attached to adjacent containers of the plurality of containers when the carrier is formed from the blank,

the at least one central panel comprises a front central panel (125a), and a back central panel (125b) in face-to-face contact with the front central panel when the carrier is formed from the blank, each of the front central panel and the back central panel has a first row (RF1) of openings (127a, 127b) and a second row (RF2) of openings (127a, 127b) spaced apart from the first row of openings,

the first row of openings is spaced a first distance (D1) from a bottom edge of the at least one central panel, and the second row of openings is spaced a second distance (D2) from the bottom edge of the at least one central panel, the second distance is greater than the first distance such that the openings (127a) in the front central panel (125a) are for being in communication with the back central panel (125b) and the openings (127b) in the back central panel are for being in communication with the front central panel when the carrier is formed from the blank for providing respective points of attachment for each respective container to the respective opposite central panel,

the at least one attachment panel comprises a front attachment panel (131a) foldably connected to the front central panel (125a) and a back attachment panel (131b) foldably connected to the back central panel (125b).

8. The blank (103) of claim 7, wherein the at least one central panel (125a, 125b) is for being adhered to adjacent containers of the plurality of containers (CA1, CA2, CA3, CB1, CB2, CB3).

9. The blank (103) of claim 7, wherein, when the carrier (105) is formed from the blank, the at least one access feature (205) is reconfigurable between a first configuration in which the marginal portion (199) of the top panel (173) is generally perpendicular to the at least one central panel (125a, 125b), and a second configuration in which the marginal portion of the top panel and the marginal portion (138a, 138b) of the at least one attachment panel (131a, 131b) are raised to allow access to at least one container of the plurality of containers (CA1, CA2, CA3, CB1, CB2, CB3).

10. The blank (103) of claim 9, wherein the at least one access feature further (205) comprises a side panel (169a) foldably connected to the marginal portion (199) of the top panel (173) and the marginal portion (128a) of the at least one attachment panel (131a), the marginal portion of the top panel is a first marginal portion (199) of the top panel and the blank further comprises a second marginal portion (201) of the top panel, the side panel is a front side panel (169a) and the blank further comprises a back side panel (169b) foldably connected to the back attachment panel (131b), the top panel comprises a central portion (197), the at least one access feature is a first access feature (205) foldably connected to the central portion of the top panel at a first fold line (193), and the blank further comprises a second access feature (207) comprising the second marginal portion (201) of the top panel and a marginal portion (138b) of the back attachment panel, the second access feature is foldably connected to the central portion of the top panel at a second fold line (195).

11. The blank (103) of claim 7, wherein at least one of the at least one central panel (125a, 125b) and the at least one attachment panel (131a, 131b) includes at least one handle opening (130a, 130b), the top panel (173) comprises at least one handle feature (183, 185) for being aligned with the at least one handle opening when the carrier (105) is formed from the blank.

12. A method of forming a carrier (105) for holding a plurality of containers (CA1, CA2, CA3, CB1, CB2, CB3), the method comprising:

obtaining a blank (103) comprising a plurality of panels comprising a top panel (173), at least one central panel (125a, 125b), and at least one attachment panel (131a, 131b), and at least one access feature (205) comprising a marginal portion (199, 201) of the top panel and a marginal portion (138a, 138b) of the at least one attachment panel,

the at least one central panel comprises a front central panel (125a), and a back central panel (125b), each of the front central panel and the back central panel has a first row of openings (RF1) and a second row (RF2) of openings (127a, 127b) spaced apart from the first row of openings,
the first row of openings is spaced a first distance (D1) from a bottom edge of the at least one central panel, and the second row of openings is spaced a second distance (D2) from the bottom edge of the at least one central panel, the second distance is greater than the first distance,
the at least one attachment panel comprises a front attachment panel (131a) foldably connected to the front central panel (125a) and a back attachment panel (131b) foldably connected to the back central panel (125b);
folding the plurality of panels such that the front central panel and the back central panel are in face-to-face contact and positioned between adjacent containers of the plurality of containers such that the openings (127a) in the front central panel (125a) are in communication with the back central panel (125b) and the openings (127b) in the back central panel are in communication with the front central panel for providing respective points of attachment for each respective container to the respective opposite central panel; and
attaching at least one container of the plurality of containers to the at least one central panel, the at least one access feature is positionable for allowing access to at least one container of the plurality of containers.

13. The method of claim 12, wherein the at least one central panel (125a, 125b) is for being adhered to adjacent containers of the plurality of containers (CA1, CA2, CA3, CB1, CB2, CB3).

14. The method of claim 12, wherein the at least one access feature (205) is reconfigurable between a first configuration in which the marginal portion (199) of the top panel (173) is generally perpendicular to the at least one central panel (125a), and a second configuration in which the marginal portion of the top panel and the marginal portion (138a) of the at least one attachment panel (131a) are raised to allow access to at least one container of the plurality of containers.

15. The method of claim 14, wherein the at least one access feature (205) further comprises a side panel (169a) foldably connected to the marginal portion (199) of the top panel (173) and the marginal portion (138a) of the at least one attachment panel (131a, 131b), and the marginal portion of the top panel overlaps the marginal portion of the at least one attachment panel.

16. The method of claim 14, wherein the at least one access feature further (205) comprises a side panel (169a) foldably connected to the marginal portion (199) of the top panel (173) and the marginal portion (138a) of the at least one attachment panel (131a), and the marginal portion of the top panel is a first marginal portion (199) of the top panel and the carrier further comprises a second marginal portion (201) of the top panel, the at least one side panel is a front side panel (169a) and the carrier (105) further comprises a back side panel (169b) foldably connected to the back attachment panel (131b), the top panel comprises a central portion (197), the at least one access feature is a first access feature (205) foldably connected to the central portion of the top panel at a first fold line (193), and the carrier further comprises a second access feature (207) comprising the second marginal portion (201) of the top panel and a marginal portion (138b) of the back attachment panel, the second access feature is foldably connected to the central portion of the top panel at a second fold line (195).

17. The method of claim 12, wherein at least one of the at least one central panel (125a, 125b) and the at least one attachment panel (131a, 131b) includes at least one handle opening (130a, 130b), the top panel (173) comprises at least one handle feature (183, 185), the at least one handle feature is aligned with the at least one handle opening.

18. A package (110) comprising: a plurality of containers (CA1, CA2, CA3, CB1, CB2, CB3); and the carrier (105) of claim 1 holding the plurality of containers.

19. The package (110) of claim 18, wherein the at least one central panel (125a, 125b) is adhered to adjacent containers of the plurality of containers (CA1, CA2, CA3, CB1, CB2, CB3).

Patentansprüche

1. Träger (105) zum Halten einer Mehrzahl von Behältern (CA1, CA2, CA3, CB1, CB2, CB3), wobei der Träger umfasst:

eine Mehrzahl von Platten mit einer oberen Platte (173), mindestens einer zentralen Platte (125a, 125b) und mindestens einer Befestigungsplatte (131a, 131b), die derart konfiguriert ist, dass sie einen Teil eines oder mehrerer Behälter der Mehrzahl von Behältern aufnimmt, wobei mindestens eine zentrale Platte dazu vor-

gesehen ist, zwischen benachbarten Behältern der Mehrzahl von Behältern positioniert und an diesen befestigt zu werden; und

mindestens ein Zugangsmerkmal (205), das positionierbar ist, um Zugang zu mindestens einem Behälter der Mehrzahl von Behältern zu ermöglichen, wobei das mindestens eine Zugangsmerkmal einen Randabschnitt (199, 201) der oberen Platte und einen Randabschnitt (138a, 138b) der mindestens einen Befestigungsplatte umfasst,

die mindestens eine zentrale Platte eine vordere zentrale Platte (125a) und eine hintere zentrale Platte (125b) in Flächenkontakt mit der vorderen zentralen Platte umfasst, die mindestens eine Befestigungsplatte eine vordere Befestigungsplatte (131a), die faltbar mit der vorderen zentralen Platte (125a) verbunden ist, und eine hintere Befestigungsplatte (131b), die faltbar mit der hinteren zentralen Platte (125b) verbunden ist, umfasst,

dadurch gekennzeichnet, dass

jede der vorderen zentralen Platte und der hinteren zentralen Platte eine erste Reihe (RF1) von Öffnungen (127a, 127b) und eine zweite Reihe (RF2) von Öffnungen (127a, 127b), die von der ersten Reihe von Öffnungen beabstandet angeordnet ist, aufweist,

die erste Reihe von Öffnungen in einem ersten Abstand (D1) von einer unteren Kante der mindestens einen zentralen Platte beabstandet angeordnet ist, und die zweite Reihe von Öffnungen in einem zweiten Abstand (D2) von der unteren Kante der mindestens einen zentralen Platte beabstandet angeordnet ist, wobei der zweite Abstand größer als der erste Abstand ist, so dass die Öffnungen (127a) in der vorderen zentralen Platte (125a) mit der hinteren zentralen Platte (125b) in Kommunikation stehen und die Öffnungen (127b) in der hinteren zentralen Platte mit der vorderen zentralen Platte in Kommunikation stehen, um entsprechende Befestigungspunkte für jeden entsprechenden Behälter an der entsprechenden gegenüberliegenden zentralen Platte bereitzustellen.

2. Träger (105) nach Anspruch 1, wobei die mindestens eine zentrale Platte (125a, 125b) dazu vorgesehen ist, an benachbarte Behälter der Mehrzahl von Behältern (CA1, CA2, CA3, Cb1, CB2, CB3) geklebt zu werden.

3. Träger (105) nach Anspruch 1, wobei das mindestens eine Zugangsmerkmal (205) zwischen einer ersten Konfiguration, in der der Randabschnitt (199) der oberen Platte (173) im Allgemeinen senkrecht zu der mindestens einen zentralen Platte (125a, 125b) ist, und einer zweiten Konfiguration, in der der Randabschnitt der oberen Platte und der Randabschnitt (138a, 138b) der mindestens einen Befestigungsplatte (131a, 131b) angehoben sind, um den Zugang zu mindestens einem Behälter der Mehrzahl von Behältern zu ermöglichen, rekonfigurierbar ist.

4. Träger (105) nach Anspruch 3, wobei das mindestens eine Zugangsmerkmal (205) ferner eine Seitenplatte (169a) umfasst, die faltbar mit dem Randabschnitt (199) der oberen Platte (173) und dem Randabschnitt (138a) der mindestens einen Befestigungsplatte (131a) verbunden ist, und der Randabschnitt der oberen Platte den Randabschnitt der mindestens einen Befestigungsplatte überlappt.

5. Träger (105) nach Anspruch 3, wobei das mindestens eine Zugangsmerkmal (205) ferner eine Seitenplatte (169a) umfasst, die faltbar mit dem Randbereich (199) der oberen Platte (173) und dem Randbereich (138a) der mindestens einen Befestigungsplatte (131a) verbunden ist, und der Randbereich der oberen Platte ein erster Randbereich (199) der oberen Platte ist und der Träger ferner einen zweiten Randbereich (201) der oberen Platte umfasst, die Seitenplatte eine vordere Seitenplatte (169a) ist und der Träger ferner eine hintere Seitenplatte (169b), die faltbar mit der hinteren Befestigungsplatte (131b) verbunden ist, umfasst, die obere Platte einen zentralen Abschnitt (197) umfasst, das mindestens eine Zugangsmerkmal ein erstes Zugangsmerkmal (205) ist, das faltbar mit dem zentralen Abschnitt der oberen Platte an einer ersten Faltlinie (193) verbunden ist, und der Träger ferner ein zweites Zugangsmerkmal (207), das den zweiten Randabschnitt (201) der oberen Platte und einen Randabschnitt (138b) der hinteren Befestigungsplatte umfasst, umfasst, wobei das zweite Zugangsmerkmal faltbar mit dem zentralen Abschnitt der oberen Platte an einer zweiten Faltlinie (195) verbunden ist.

6. Träger (105) nach Anspruch 1, wobei mindestens eine von der mindestens einen zentralen Platte (125a, 125b) und der mindestens einen Befestigungsplatte (131a, 131b) mindestens eine Grifföffnung (130a, 130b) aufweist, die obere Platte (173) mindestens ein Griffmerkmal (183, 185) umfasst, das mindestens eine Griffmerkmal an der mindestens einen Grifföffnung ausgerichtet ist.

7. Zuschnitt (103) zur Bildung eines Trägers (105) zur Aufnahme einer Mehrzahl von Behältern (CA1, CA2, CA3, CB1, CB2, CB3), wobei der Zuschnitt umfasst:

eine Mehrzahl von Platten, die eine obere Platte (173), mindestens eine zentrale Platte (125a, 125b) und mindestens eine Befestigungsplatte (131a, 131b) umfasst, und

mindestens ein Zugangsmerkmal (205), das einen Randabschnitt (199, 201) der oberen Platte und einen Randabschnitt (138a, 138b) der mindestens einen Befestigungsplatte umfasst, wobei das mindestens eine Zugangsmerkmal positionierbar ist, um Zugang zu mindestens einem Behälter der Mehrzahl von Behältern zu ermöglichen, wenn der Träger aus dem Zuschnitt gebildet wird,
die mindestens eine zentrale Platte dazu vorgesehen ist, zwischen benachbarten Behältern der Mehrzahl von Behältern positioniert und an ihnen befestigt zu werden, wenn der Träger aus dem Zuschnitt gebildet wird,
die mindestens eine zentrale Platte eine vordere zentrale Platte (125a) und eine hintere zentrale Platte (125b) umfasst, die in Flächenkontakt mit der vorderen zentralen Platte steht, wenn der Träger aus dem Zuschnitt gebildet wird, wobei sowohl die vordere zentrale Platte als auch die hintere zentrale Platte eine erste Reihe (RF1) von Öffnungen (127a, 127b) und eine zweite Reihe (RF2) von Öffnungen (127a, 127b), die von der ersten Reihe von Öffnungen beabstandet angeordnet ist, aufweist,
die erste Reihe von Öffnungen in einem ersten Abstand (D1) von einer unteren Kante der mindestens einen zentralen Platte beabstandet angeordnet ist, und die zweite Reihe von Öffnungen in einem zweiten Abstand (D2) von der unteren Kante der mindestens einen zentralen Platte beabstandet angeordnet ist, und der zweite Abstand größer als der erste Abstand ist, so dass die Öffnungen (127a) in der vorderen zentralen Platte (125a) dazu vorgesehen sind, mit der hinteren zentralen Platte (125b) in Kommunikation zu stehen, und die Öffnungen (127b) in der hinteren zentralen Platte dazu vorgesehen sind, mit der vorderen zentralen Platte in Kommunikation zu stehen, wenn der Träger aus dem Zuschnitt gebildet wird, um entsprechende Befestigungspunkte für jeden entsprechenden Behälter an der entsprechenden gegenüberliegenden zentralen Platte bereitzustellen,
die mindestens eine Befestigungsplatte eine vordere Befestigungsplatte (131a), die faltbar mit der vorderen zentralen Platte (125a) verbunden ist, und eine hintere Befestigungsplatte (131b), die faltbar mit der hinteren zentralen Platte (125b) verbunden ist, umfasst.

8. Zuschnitt (103) nach Anspruch 7, wobei die mindestens eine zentrale Platte (125a, 125b) dazu vorgesehen ist, an benachbarte Behälter der Mehrzahl von Behältern (CA1, CA2, CA3, CB1, CB2, CB3) geklebt zu werden.

9. Zuschnitt (103) nach Anspruch 7, wobei, wenn der Träger (105) aus dem Zuschnitt gebildet wird, das mindestens eine Zugangsmerkmal (205) zwischen einer ersten Konfiguration, in der der Randabschnitt (199) der oberen Platte (173) im Allgemeinen senkrecht zu der mindestens einen zentralen Platte (125a, 125b) steht, und einer zweiten Konfiguration, in der der Randbereich der oberen Platte und der Randbereich (138a, 138b) der mindestens einen Befestigungsplatte (131a, 131b) angehoben sind, um den Zugang zu mindestens einem Behälter der Mehrzahl von Behältern (CA1, CA2, CA3, CB1, CB2, CB3) zu ermöglichen, rekonfigurierbar ist.

10. Zuschnitt (103) nach Anspruch 9, wobei das mindestens eine Zugangsmerkmal (205) ferner eine Seitenplatte (169a) umfasst, die faltbar mit dem Randabschnitt (199) der oberen Platte (173) und dem Randabschnitt (128a) der mindestens einen Befestigungsplatte (131a) verbunden ist, wobei der Randabschnitt der oberen Platte ein erster Randabschnitt (199) der oberen Platte ist und der Zuschnitt ferner einen zweiten Randabschnitt (201) der oberen Platte umfasst, die Seitenplatte eine vordere Seitenplatte (169a) ist und der Zuschnitt ferner eine hintere Seitenplatte (169b) umfasst, die faltbar mit der hinteren Befestigungsplatte (131b) verbunden ist, die obere Platte einen zentralen Abschnitt (197) umfasst, das mindestens eine Zugangsmerkmal ein erstes Zugangsmerkmal (205) ist, das faltbar mit dem zentralen Abschnitt der oberen Platte an einer ersten Faltlinie (193) verbunden ist, und der Zuschnitt ferner ein zweites Zugangsmerkmal (207) umfasst, das den zweiten Randabschnitt (201) der oberen Platte und einen Randabschnitt (138b) der hinteren Befestigungsplatte umfasst, wobei das zweite Zugangsmerkmal faltbar mit dem zentralen Abschnitt der oberen Platte an einer zweiten Faltlinie (195) verbunden ist.

11. Zuschnitt (103) nach Anspruch 7, wobei mindestens eine der mindestens einen zentralen Platte (125a, 125b) und der mindestens einen Befestigungsplatte (131a, 131b) mindestens eine Grifföffnung (130a, 130b) aufweist und die obere Platte (173) mindestens ein Griffmerkmal (183, 185) aufweist, das an der mindestens einen Grifföffnung ausgerichtet wird, wenn der Träger (105) aus dem Zuschnitt gebildet wird.

12. Verfahren zur Herstellung eines Trägers (105) zum Halten einer Mehrzahl von Behältern (CA1, CA2, CA3, CB1, CB2, CB3), wobei das Verfahren umfasst:

Erhalten eines Zuschnitts (103), der eine Mehrzahl von Platten, die eine obere Platte (173), mindestens eine zentrale Platte (125a, 125b) und mindestens eine Befestigungsplatte

(131a, 131b) umfasst, und mindestens ein Zugangsmerkmal (205), das einen Randabschnitt (199, 201) der oberen Platte und einen Randabschnitt (138a, 138b) der mindestens einen Befestigungsplatte umfasst, umfasst,
die mindestens eine zentrale Platte eine vordere zentrale Platte (125a) und eine hintere zentrale Platte (125b) umfasst, wobei jede der vorderen zentralen Platte und der hinteren zentralen Platte eine erste Reihe von Öffnungen (RF1) und eine zweite Reihe (RF2) von Öffnungen (127a, 127b), die von der ersten Reihe von Öffnungen beabstandet angeordnet ist, aufweist,
die erste Reihe von Öffnungen in einem ersten Abstand (D1) von einer unteren Kante der mindestens einen zentralen Platte beabstandet angeordnet ist, und die zweite Reihe von Öffnungen in einem zweiten Abstand (D2) von der unteren Kante der mindestens einen zentralen Platte beabstandet angeordnet ist, wobei der zweite Abstand größer als der erste Abstand ist,
die mindestens eine Befestigungsplatte eine vordere Befestigungsplatte (131a), die faltbar mit der vorderen zentralen Platte (125a) verbunden ist, und eine hintere Befestigungsplatte (131b), die faltbar mit der hinteren zentralen Platte (125b) verbunden ist, umfasst;
Falten der Mehrzahl von Platten derart, dass die vordere zentrale Platte und die hintere zentrale Platte in Flächenkontakt stehen und zwischen benachbarten Behältern der Mehrzahl von Behältern positioniert sind, so dass die Öffnungen (127a) in der vorderen zentrale Platte (125a) mit der hinteren zentrale Platte (125b) in Kommunikation stehen und die Öffnungen (127b) in der hinteren zentralen Platte mit der vorderen zentralen Platte in Kommunikation stehen, um entsprechende Befestigungspunkte für jeden entsprechenden Behälter an der entsprechenden gegenüberliegenden zentralen Platte bereitzustellen; und
Anbringen mindestens eines Behälters aus der Mehrzahl von Behältern an der mindestens einen zentralen Platte, wobei das mindestens eine Zugangsmerkmal positionierbar ist, um Zugang zu mindestens einem Behälter aus der Mehrzahl von Behältern zu ermöglichen.

13. Verfahren nach Anspruch 12, wobei die mindestens eine zentrale Platte (125a, 125b) dazu vorgesehen ist, an benachbarte Behälter der Mehrzahl von Behältern (CA1, CA2, CA3, CB1, CB2, CB3) geklebt zu werden.

14. Verfahren nach Anspruch 12, wobei das mindestens eine Zugangsmerkmal (205) zwischen einer ersten Konfiguration, in der der Randabschnitt (199) der oberen Platte (173) im Allgemeinen senkrecht zu der mindestens einen zentrale Platte (125a) steht, und einer zweiten Konfiguration, in der der Randabschnitt der oberen Platte und der Randabschnitt (138a) der mindestens einen Befestigungsplatte (131a) angehoben sind, um den Zugang zu mindestens einem Behälter der Mehrzahl von Behältern zu ermöglichen, rekonfigurierbar ist.

15. Verfahren nach Anspruch 14, wobei das mindestens eine Zugangsmerkmal (205) ferner eine Seitenplatte (169a) umfasst, die faltbar mit dem Randabschnitt (199) der oberen Platte (173) und dem Randabschnitt (138a) der mindestens einen Befestigungsplatte (131a, 131b) verbunden ist, und der Randabschnitt der oberen Platte den Randabschnitt der mindestens einen Befestigungsplatte überlappt.

16. Verfahren nach Anspruch 14, wobei das mindestens eine Zugangsmerkmal (205) ferner eine Seitenplatte (169a) umfasst, die faltbar mit dem Randabschnitt (199) der oberen Platte (173) und dem Randabschnitt (138a) der mindestens einen Befestigungsplatte (131a) verbunden ist, und der Randabschnitt der oberen Platte ein erster Randabschnitt (199) der oberen Platte ist und der Träger ferner einen zweiten Randabschnitt (201) der oberen Platte umfasst, die mindestens eine Seitenplatte eine vordere Seitenplatte (169a) ist und der Träger (105) ferner eine hintere Seitenplatte (169b) umfasst, die faltbar mit der hinteren Befestigungsplatte (131b) verbunden ist, die obere Platte einen zentralen Abschnitt (197) umfasst, das mindestens eine Zugangsmerkmal ein erstes Zugangsmerkmal (205) ist, das faltbar mit dem zentralen Abschnitt der oberen Platte an einer ersten Faltlinie (193) verbunden ist, und der Träger weiterhin ein zweites Zugangsmerkmal (207) umfasst, das den zweiten Randabschnitt (201) der oberen Platte und einen Randabschnitt (138b) der hinteren Befestigungsplatte umfasst, wobei das zweite Zugangsmerkmal faltbar mit dem zentralen Abschnitt der oberen Platte an einer zweiten Faltlinie (195) verbunden ist.

17. Verfahren nach Anspruch 12, wobei mindestens eine der mindestens einen zentralen Platte (125a, 125b) und der mindestens einen Befestigungsplatte (131a, 131b) mindestens eine Grifföffnung (130a, 130b) aufweist, die obere Platte (173) mindestens ein Griffmerkmal (183, 185) umfasst und das mindestens eine Griffmerkmal an der mindestens einen Grifföffnung ausgerichtet ist.

18. Verpackung (110), umfassend: eine Mehrzahl von Behältern (CA1, CA2, CA3, CB1, CB2, CB3); und den Träger (105) nach Anspruch 1, der die Mehrzahl von Behältern hält.

19. Verpackung (110) nach Anspruch 18, wobei die min-

destens eine zentrale Platte (125a, 125b) an benachbarte Behälter der Mehrzahl von Behältern (CA1, CA2, CA3, CB1, CB2, CB3) geklebt ist.

Revendications

1. Dispositif de transport (105) destiné à contenir une pluralité de récipients (CA1, CA2, CA3, CB1, CB2, CB3), le dispositif de transport comprenant :

une pluralité de panneaux comprenant un panneau supérieur (173), au moins un panneau central (125a, 125b), et au moins un panneau de fixation (131a, 131b) configuré pour recevoir une partie d'un ou de plusieurs récipients parmi la pluralité de récipients, l'au moins un panneau central est destiné à être positionné entre et fixé à des récipients adjacents parmi la pluralité de récipients ; et

au moins un élément d'accès (205) apte à être positionné de manière à permettre l'accès à au moins un récipient parmi la pluralité de récipients, l'au moins un élément d'accès comprend une partie marginale (199, 201) du panneau supérieur et une partie marginale (138a, 138b) de l'au moins un panneau de fixation,

l'au moins un panneau central comprend un panneau central avant (125a) et un panneau central arrière (125b) en contact face à face avec le panneau central avant, l'au moins un panneau de fixation comprend un panneau de fixation avant (131a) relié de façon pliable au panneau central avant (125a) et un panneau de fixation arrière (131b) relié de façon pliable au panneau central arrière (125b),

caractérisé en ce que

chacun parmi le panneau central avant et le panneau central arrière comporte une première rangée (RF1) d'ouvertures (127a, 127b) et une deuxième rangée (RF2) d'ouvertures (127a, 127b) espacée de la première rangée d'ouvertures,

la première rangée d'ouvertures est espacé selon une première distance (D1) d'un bord inférieur de l'au moins un panneau central, et la deuxième rangée d'ouvertures est espacée selon une deuxième distance (D2) du bord inférieur de l'au moins un panneau central, la deuxième distance étant supérieure à la première distance, de sorte que les ouvertures (127a) dans le panneau central avant (125a) sont en communication avec le panneau central arrière (125b) et les ouvertures (127b) dans le panneau central arrière sont en communication avec le panneau central avant afin de fournir des points de fixation respectifs pour chaque récipient respectif au panneau central opposé respectif.

2. Dispositif de transport (105) selon la revendication 1, dans lequel l'au moins un panneau central (125a, 125b) est destiné à être collé à des récipients respectifs parmi la pluralité de récipients (CA1, CA2, CA3, CB1, CB2, CB3).

3. Dispositif de transport (105) selon la revendication 1, dans lequel l'au moins un élément d'accès (205) est reconfigurable entre une première configuration dans laquelle la partie marginale (199) du panneau supérieur (173) est généralement perpendiculaire à l'au moins un panneau central (125a, 125b), et une deuxième configuration dans laquelle la partie marginale du panneau supérieur et la partie marginale (138a, 138b) de l'au moins un panneau de fixation (131a, 131b) sont relevées pour permettre l'accès à au moins un récipient parmi la pluralité de récipients.

4. Dispositif de transport (105) selon la revendication 3, dans lequel l'au moins un élément d'accès (205) comprend en outre un panneau latéral (169a) relié de façon pliable à la partie marginale (199) du panneau supérieur (173) et à la partie marginale (138a) de l'au moins un panneau de fixation (131a) et la partie marginale du panneau supérieur chevauche la partie marginale de l'au moins un panneau de fixation.

5. Dispositif de transport (105) selon la revendication 3, dans lequel l'au moins un élément d'accès (205) comprend en outre un panneau latéral (169a) relié de façon pliable à la partie marginale (199) du panneau supérieur (173) et à la partie marginale (138a) de l'au moins un panneau de fixation (131a) et la partie marginale du panneau supérieur est une première partie marginale (199) du panneau supérieur et le dispositif de transport comprend en outre une deuxième partie marginale (201) du panneau supérieur, le panneau latéral est un panneau latéral avant (169a) et le dispositif de transport comprend en outre un panneau latéral arrière (169b) relié de façon pliable au panneau de fixation arrière (131b), le panneau supérieur comprend une partie centrale (197), l'au moins un élément d'accès est un premier élément d'accès (205) relié de façon pliable à la partie centrale du panneau supérieur au niveau d'une première ligne de pliage (193), et le dispositif de transport comprend en outre un deuxième élément d'accès (207) comprenant la deuxième partie marginale (201) du panneau supérieur et une partie marginale (138b) du panneau de fixation arrière, le deuxième élément d'accès étant relié de façon pliable à la partie centrale du panneau supérieur au niveau d'une deuxième ligne de pliage (195).

6. Dispositif de transport (105) selon la revendication 1, dans lequel l'un au moins parmi l'au moins un panneau central (125a, 125b) et l'au moins un panneau

de fixation (131a, 131b) inclut au moins une ouverture de poignée (130a, 130b), le panneau supérieur (173) comprend au moins un élément de poignée (183, 185), l'au moins un élément de poignée étant aligné avec l'au moins une ouverture de poignée.

7. Découpe (103) permettant de former un dispositif de transport (105) destiné à contenir une pluralité de récipients (CA1, CA2, CA3, CB1, CB2, CB3), la découpe comprenant :

une pluralité de panneaux comprenant un panneau supérieur (173), au moins un panneau central (125a, 125b), et au moins un panneau de fixation (131a, 131b), et
au moins un élément d'accès (205) comprenant une partie marginale (199, 201) du panneau supérieur et une partie marginale (138a, 138b) de l'au moins un panneau de fixation, l'au moins un élément d'accès étant destiné à pouvoir être positionné de manière à permettre l'accès à au moins un récipient parmi la pluralité de récipients lorsque le dispositif de transport est formé à partir de la découpe,
l'au moins un panneau central est destiné à être positionné entre et fixé à des récipients adjacents parmi la pluralité de récipients lorsque le dispositif de transport est formé à partir de la découpe,
l'au moins un panneau central comprend un panneau central avant (125a) et un panneau central arrière (125b) en contact face à face avec le panneau central avant lorsque le dispositif de transport est formé à partir de la découpe, chacun parmi le panneau central avant et le panneau central arrière comporte une première rangée (RF1) d'ouvertures (127a, 127b) et une deuxième rangée (RF2) d'ouvertures (127a, 127b) espacée de la première rangée d'ouvertures,
la première rangée d'ouvertures est espacé selon une première distance (D1) d'un bord inférieur de l'au moins un panneau central, et la deuxième rangée d'ouvertures est espacée selon une deuxième distance (D2) du bord inférieur de l'au moins un panneau central, la deuxième distance étant supérieure à la première distance, de sorte que les ouvertures (127a) dans le panneau central avant (125a) sont destinées à être en communication avec le panneau central arrière (125b) et les ouvertures (127b) dans le panneau central arrière sont destinées à être en communication avec le panneau central avant lorsque le dispositif de transport est formé à partir de la découpe, afin de fournir des points de fixation respectifs pour chaque récipient respectif au panneau central opposé respectif,
l'au moins un panneau de fixation comprend un panneau de fixation avant (131a) relié de façon pliable au panneau central avant (125a) et un panneau de fixation arrière (131b) relié de façon pliable au panneau central arrière (125b).

8. Découpe (103) selon la revendication 7, dans laquelle l'au moins un panneau central (125a, 125b) est destiné à être collé à des récipients adjacents parmi la pluralité de récipients (CA1, CA2, CA3, CB1, CB2, CB3).

9. Découpe (103) selon la revendication 7, dans laquelle, lorsque le dispositif de transport (105) est formé à partir de la découpe, l'au moins un élément d'accès (205) est reconfigurable entre une première configuration dans laquelle la partie marginale (199) du panneau supérieur (173) est généralement perpendiculaire à l'au moins un panneau central (125a, 125b), et une deuxième configuration dans laquelle la partie marginale du panneau supérieur et la partie marginale (138a, 138b) de l'au moins un panneau de fixation (131a, 131b) sont relevées pour permettre l'accès à au moins un récipient parmi la pluralité de récipients (CA1, CA2, CA3, CB1, CB2, CB3).

10. Découpe (103) selon la revendication 9, dans laquelle l'au moins un élément d'accès comprend en outre un panneau latéral (169a) relié de façon pliable à la partie marginale (199) du panneau supérieur (173) et à la partie marginale (128a) de l'au moins un panneau de fixation (131a), la partie marginale du panneau supérieur est une première partie marginale (199) du panneau supérieur et la découpe comprend en outre une deuxième partie marginale (201) du panneau supérieur, le panneau latéral est un panneau latéral avant (169a) et la découpe comprend en outre un panneau latéral arrière (169b) relié de façon pliable au panneau de fixation arrière (131b), le panneau supérieur comprend une partie centrale (197), l'au moins un élément d'accès est un premier élément d'accès (205) relié de façon pliable à la partie centrale du panneau supérieur au niveau d'une première ligne de pliage (193), et la découpe comprend en outre un deuxième élément d'accès (207) comprenant la deuxième partie marginale (201) du panneau supérieur et une partie marginale (138b) du panneau de fixation arrière, le deuxième élément d'accès étant relié de façon pliable à la partie centrale du panneau supérieur au niveau d'une deuxième ligne de pliage (195).

11. Découpe (103) selon la revendication 7, dans laquelle l'un au moins parmi l'au moins un panneau central (125a, 125b) et l'au moins un panneau de fixation (131a, 131b) inclut au moins une ouverture de poignée (130a, 130b), le panneau supérieur (173) comprend au moins un élément de poignée (183, 185) destiné à être aligné avec l'au moins une ou-

verture de poignée lorsque le dispositif de transport (105) est formé à partir de la découpe.

12. Procédé de formation d'un dispositif de transport (105) destiné à contenir une pluralité de récipients (CA1, CA2, CA3, CB1, CB2, CB3), le procédé comprenant :

l'obtention d'une découpe (103) comprenant une pluralité de panneaux comprenant un panneau supérieur (173), au moins un panneau central (125a, 125b), et au moins un panneau de fixation (131a, 131b), et au moins un élément d'accès (205) comprenant une partie marginale (199, 201) du panneau supérieur et une partie marginale (138a, 138b) de l'au moins un panneau de fixation,

l'au moins un panneau central comprend un panneau central avant (125a) et un panneau central arrière (125b), chacun parmi le panneau central avant et le panneau central arrière comporte une première rangée d'ouvertures (RF1) et une deuxième rangée d'ouvertures (RF2) espacée de la première rangée d'ouvertures,

la première rangée d'ouvertures est espacée selon une première distance (D1) d'un bord inférieur de l'au moins un panneau central, et la deuxième rangée d'ouvertures est espacée selon une deuxième distance (D2) du bord inférieur de l'au moins un panneau central , la deuxième distance étant supérieure à la première distance,

l'au moins un panneau de fixation comprend un panneau de fixation avant (131a) relié de façon pliable au panneau central avant (125a) et un panneau de fixation arrière (131b) relié de façon pliable au panneau central arrière (125b) ;

le pliage de la pluralité de panneaux de telle façon que le panneau central avant et le panneau central arrière sont en contact face à face et positionnés entre des récipients adjacents parmi la pluralité de récipients, de telle façon que les ouvertures (127a) dans le panneau central avant (125a) sont en communication avec le panneau central arrière (125b) et les ouvertures (127b) dans le panneau central arrière sont en communication avec le panneau central avant afin de fournir des points de fixation respectifs pour chaque récipient respectif au panneau central opposé respectif ; et

la fixation d'au moins un récipients parmi la pluralité de récipients à l'au moins un panneau central, l'au moins un élément d'accès pouvant être positionné de manière à permettre l'accès à au moins un récipient parmi la pluralité de récipients.

13. Procédé selon la revendication 12, dans lequel l'au moins un panneau central (125a, 125b) est destiné à être collé à des récipients adjacents parmi la pluralité de récipients (CA1, CA2, CA3, CB1, CB2, CB3).

14. Procédé selon la revendication 12, dans lequel l'au moins un élément d'accès (205) est reconfigurable entre une première configuration dans laquelle la partie marginale (199) du panneau supérieur (173) est généralement perpendiculaire à l'au moins un panneau central (125a), et une deuxième configuration dans laquelle la partie marginale du panneau supérieur et la partie marginale (138a) de l'au moins un panneau de fixation (131a) sont relevées pour permettre l'accès à au moins un récipient parmi la pluralité de récipients.

15. Procédé selon la revendication 14, dans lequel l'au moins un élément d'accès (205) comprend en outre un panneau latéral (169a) relié de façon pliable à la partie marginale (199) du panneau supérieur (173) et à la partie marginale (138a) de l'au moins un panneau de fixation (131a, 131b), et la partie marginale du panneau supérieur chevauche la partie marginale de l'au moins un panneau de fixation.

16. Procédé selon la revendication 14, dans lequel l'au moins un élément d'accès (205) comprend un panneau latéral (169a) relié de façon pliable à la partie marginale (199) du panneau supérieur (173) et à la partie marginale (138a) de l'au moins un panneau de fixation (131a), et la partie marginale du panneau supérieur est une première partie marginale (199) du panneau supérieur et le dispositif de transport comprend en outre une deuxième partie marginale (201) du panneau supérieur, l'au moins un panneau latéral est un panneau latéral avant (169a) et le dispositif de transport comprend en outre un panneau latéral arrière (169b) relié de façon pliable au panneau de fixation arrière (131b), le panneau supérieur comprend une partie centrale (197), l'au moins un élément d'accès est un premier élément d'accès (205) relié de façon pliable à la partie centrale du panneau supérieur au niveau d'une première ligne de pliage (193), et le dispositif de transport comprend en outre un deuxième élément d'accès (207) comprenant la deuxième partie marginale (201) du panneau supérieur et une partie marginale (138b) du panneau de fixation arrière, le deuxième élément d'accès étant relié de façon pliable à la partie centrale du panneau supérieur au niveau d'une deuxième ligne de pliage (195).

17. Procédé selon la revendication 12, dans lequel l'un au moins parmi l'au moins un panneau central (125a, 125b) et l'au moins un panneau de fixation (131a, 131b) inclut au moins une ouverture de poignée (130a, 130b), le panneau supérieur (173) comprend

au moins un élément de poignée (183, 185), l'au moins un élément de poignée étant aligné avec l'au moins une ouverture de poignée.

18. Emballage (110) comprenant :

une pluralité de récipients (CA1, CA2, CA3, CB1, CB2, CB3) ; et
le dispositif de transport (105) selon la revendication 1 contenant la pluralité de récipients.

19. Emballage (110) selon la revendication 18, dans lequel l'au moins un panneau central (125a, 125b) est collé à des récipients adjacents parmi la pluralité de récipients (CA1, CA2, CA3, CB1, CB2, CB3).

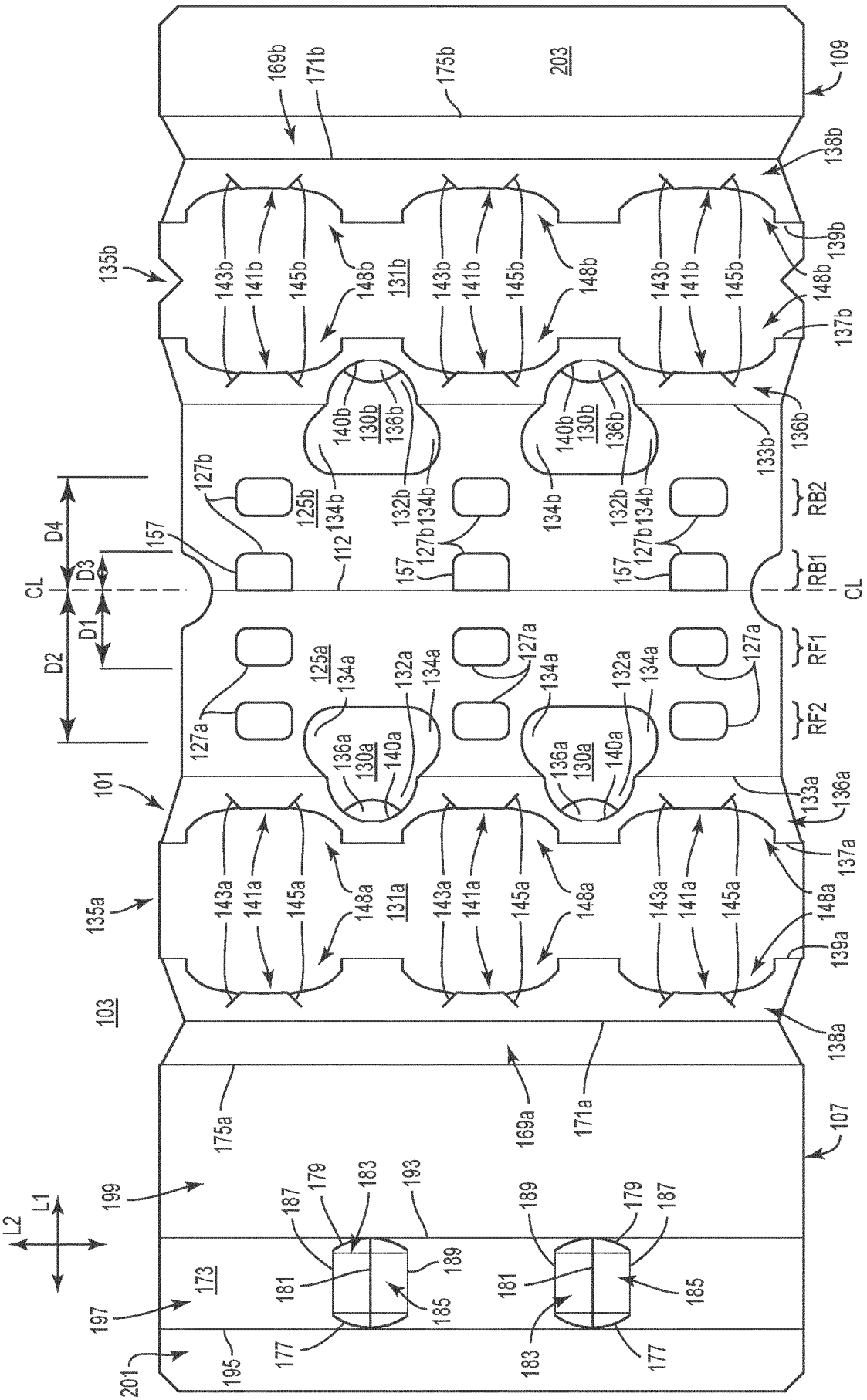

169b
171b
175b
203
109
138b
135b
143b
141b
145b
148b
131b
139b
137b
136b
133b
140b
130b
136b
127b
125b
134b
132b
112
157
RB2
RB1
CL
D4
D3
D1
D2
127a
125a
134a
132a
127a
RF1
RF2
136a
130a
140a
101
133a
136a
135a
143a
141a
145a
148a
131a
137a
139a
103
138a
175a
169a
171a
107
199
L2
L1
187
179
183
193
189
181
185
177
173
197
195
201

FIG. 1

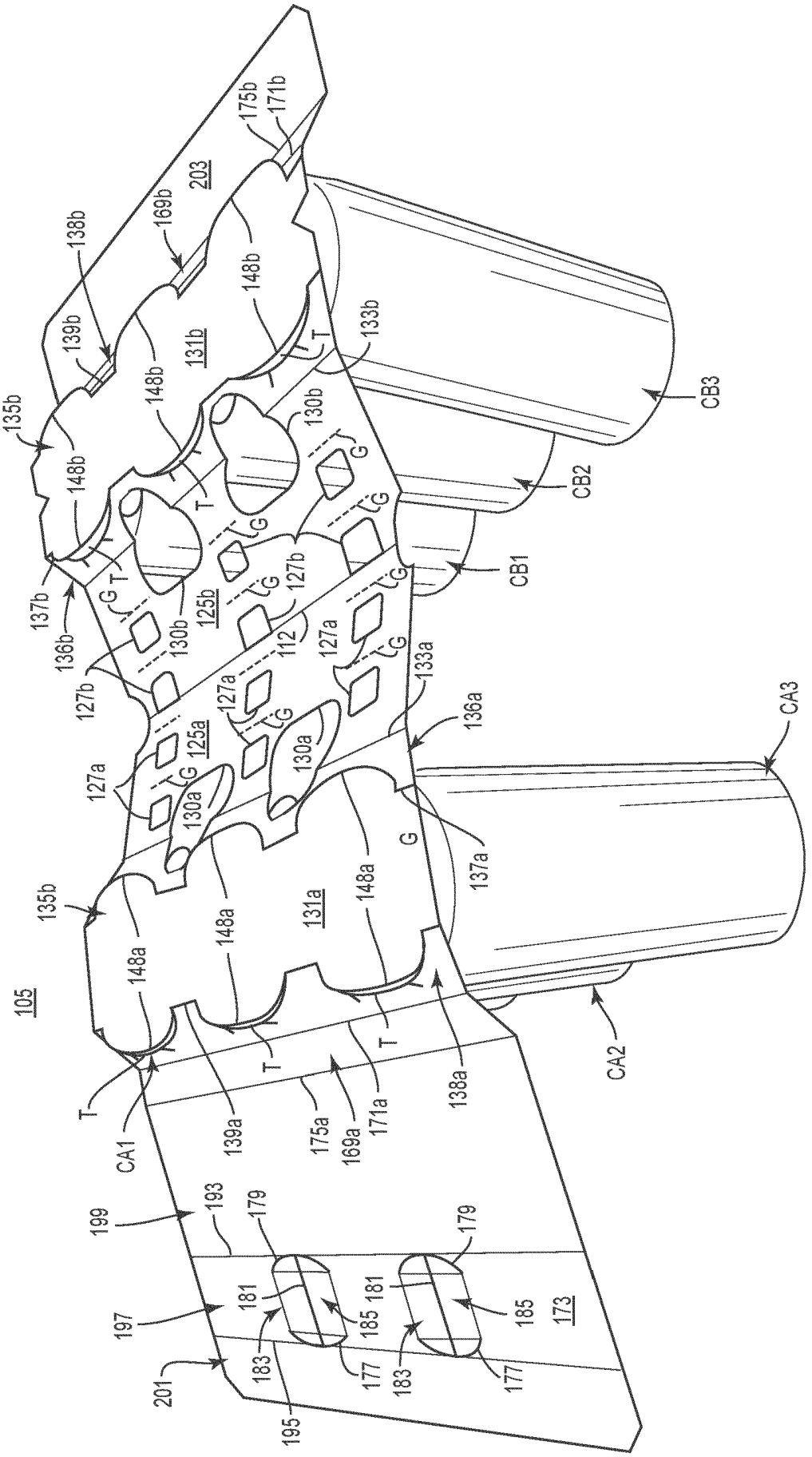

105
135b
148a
131a
148a
125a
130a
127a
G
T
CA1
139a
175a
169a
171a
138a
CA2
CA3
137a
136a
133a
130a
127a
112
125b
127b
130b
136b
137b
135b
148b
131b
148b
139b
138b
169b
203
175b
171b
133b
CB3
CB2
CB1
193
179
199
197
181
185
183
177
201
195
173

FIG. 2

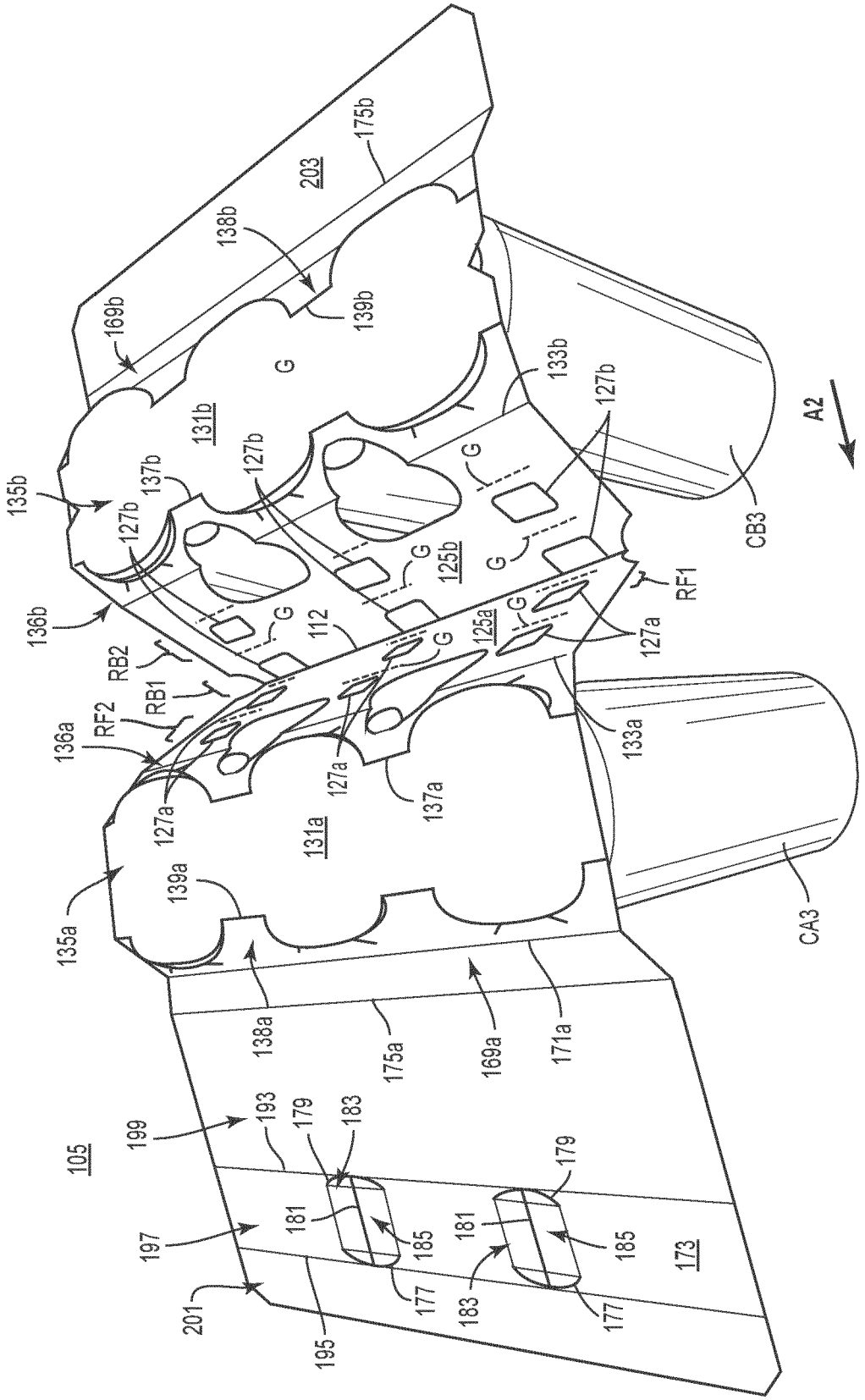

105
131a
131b
203
112
125a
125b
135a
135b
136a
136b
138a
138b
139a
139b
169a
169b
171a
173
175a
175b
177
179
181
183
185
193
195
197
199
201
CA3
CB3
RF1
RF2
RB1
RB2
A1
A2
G

FIG. 3

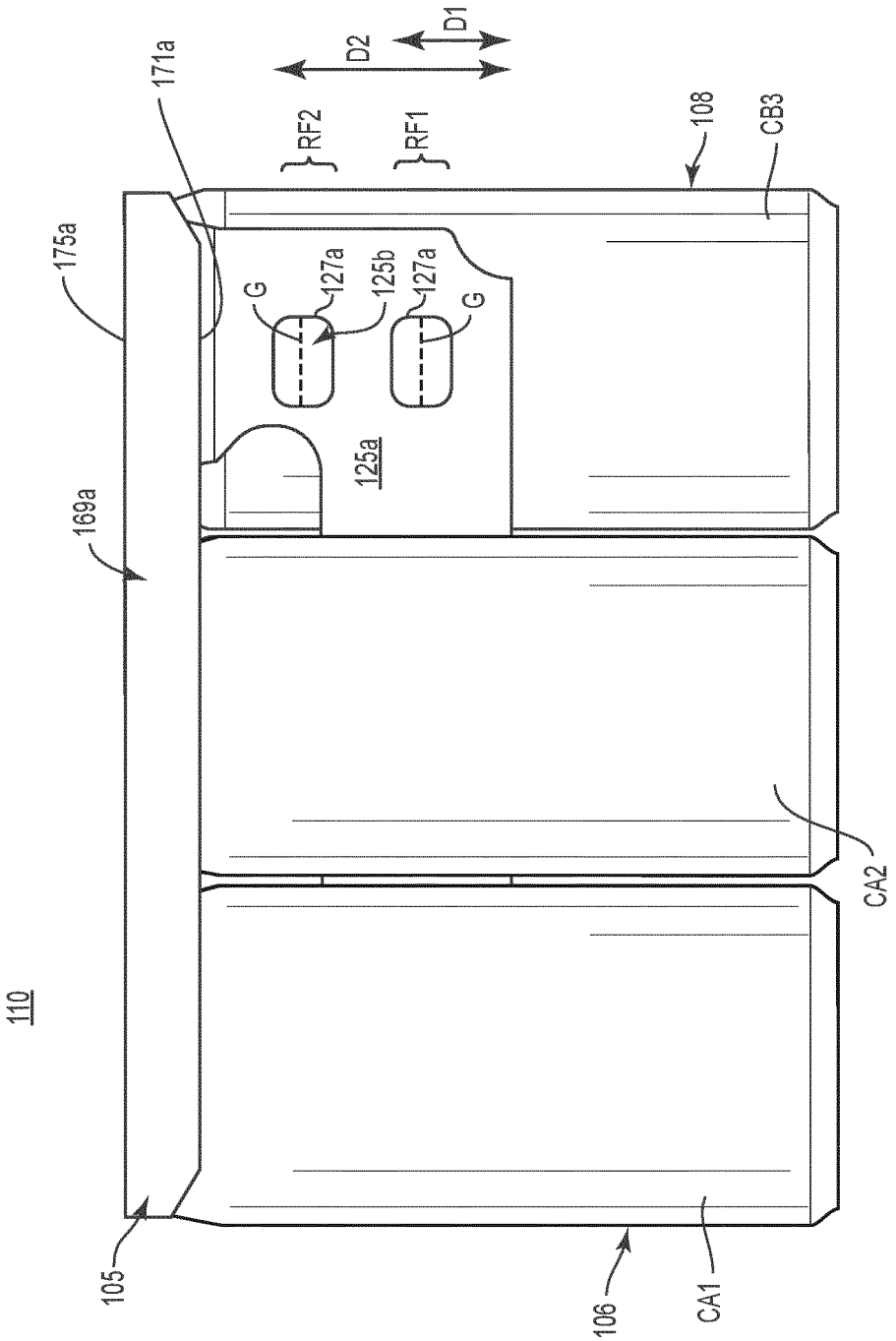

D2
D1
RF2
RF1
171a
108
CB3
175a
G
127a
125b
127a
G
125a
169a
110
CA2
105
106
CA1

FIG. 4

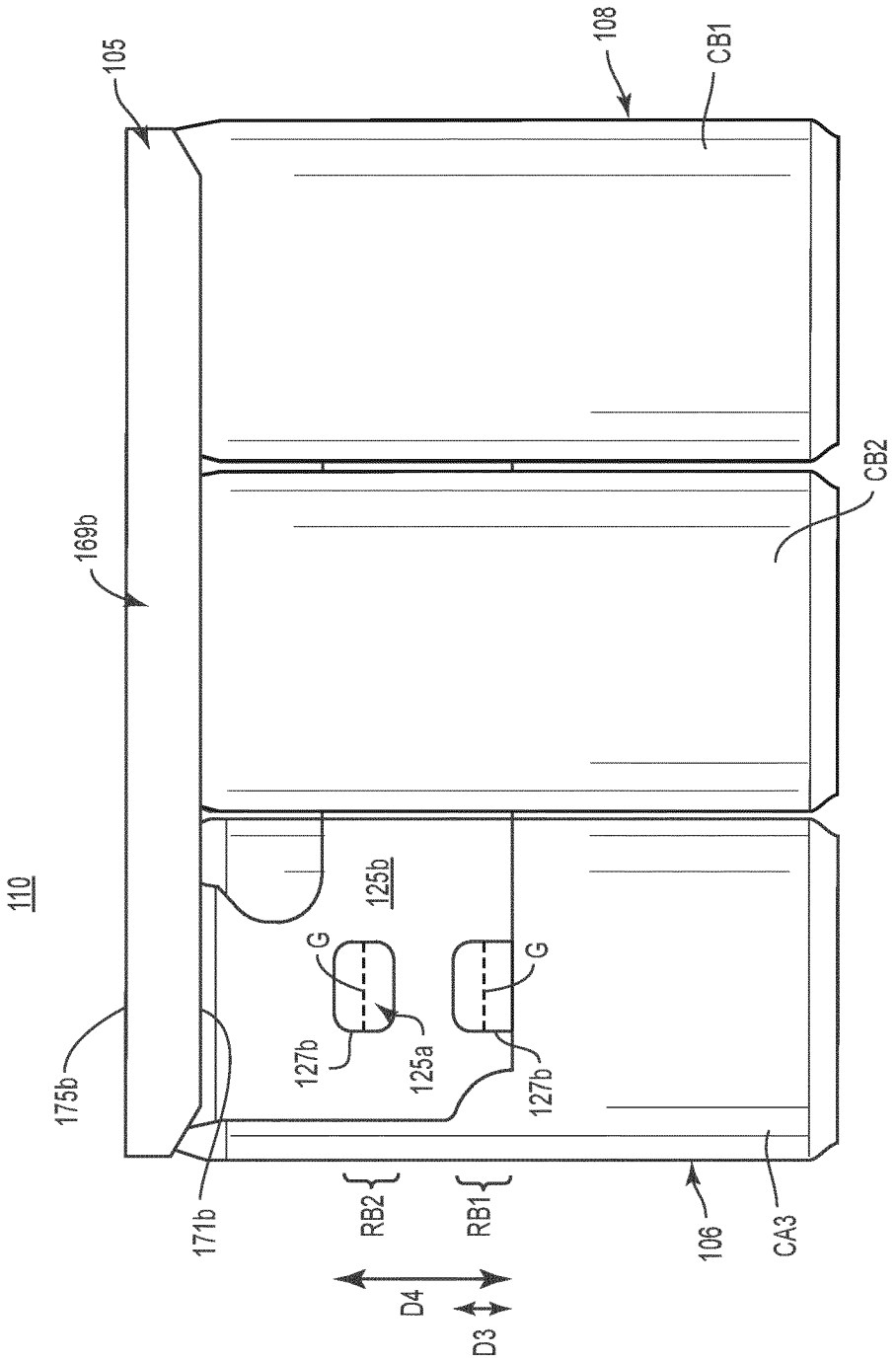

105
108
CB1
CB2
169b
110
125b
G
G
127b
125a
127b
175b
171b
RB2
RB1
106
CA3
D4
D3

FIG. 5

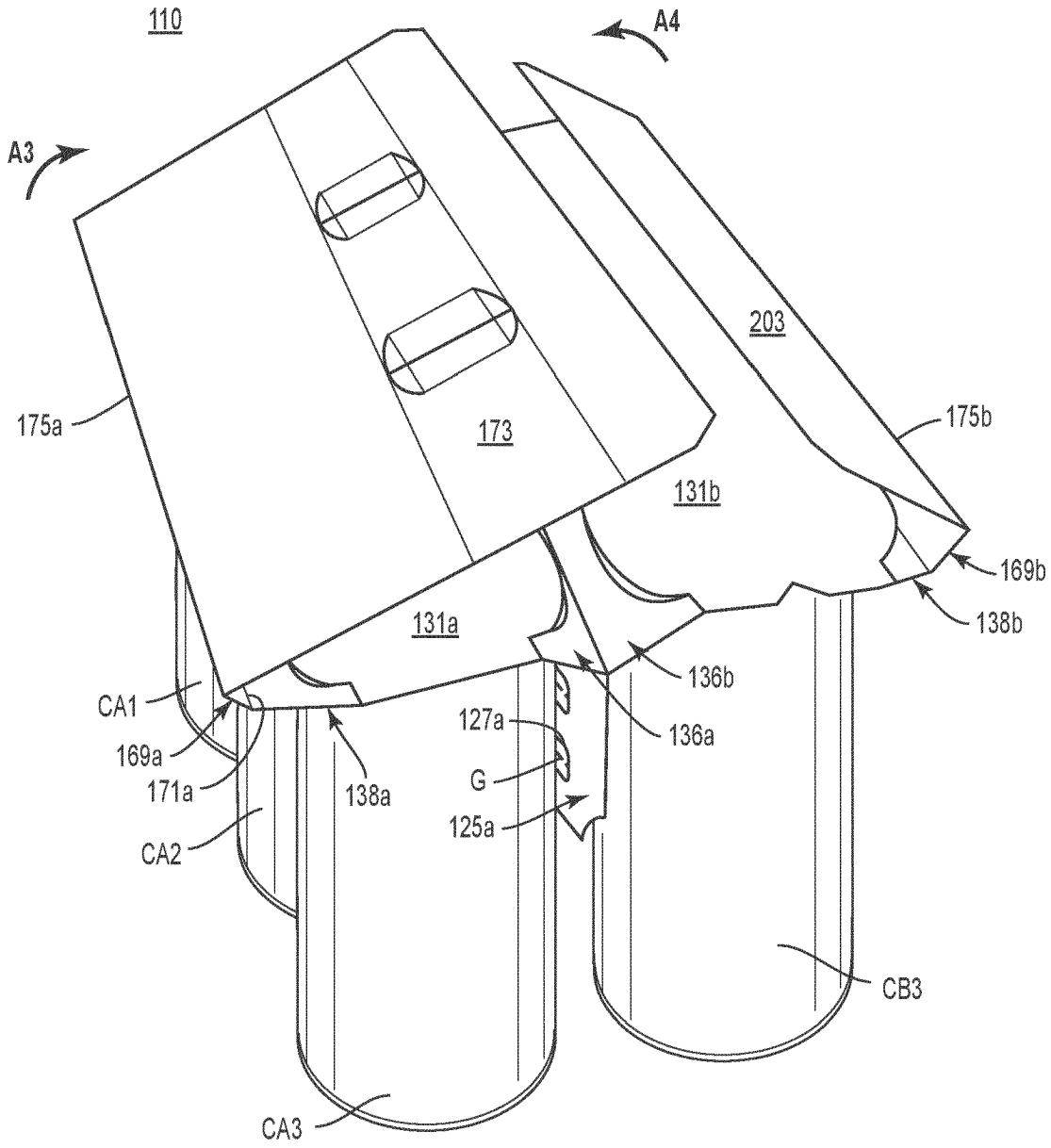

110
A4
A3
203
175a
173
175b
131b
169b
138b
131a
136b
136a
CA1
127a
169a
G
171a
138a
125a
CA2
CB3
CA3

FIG. 6

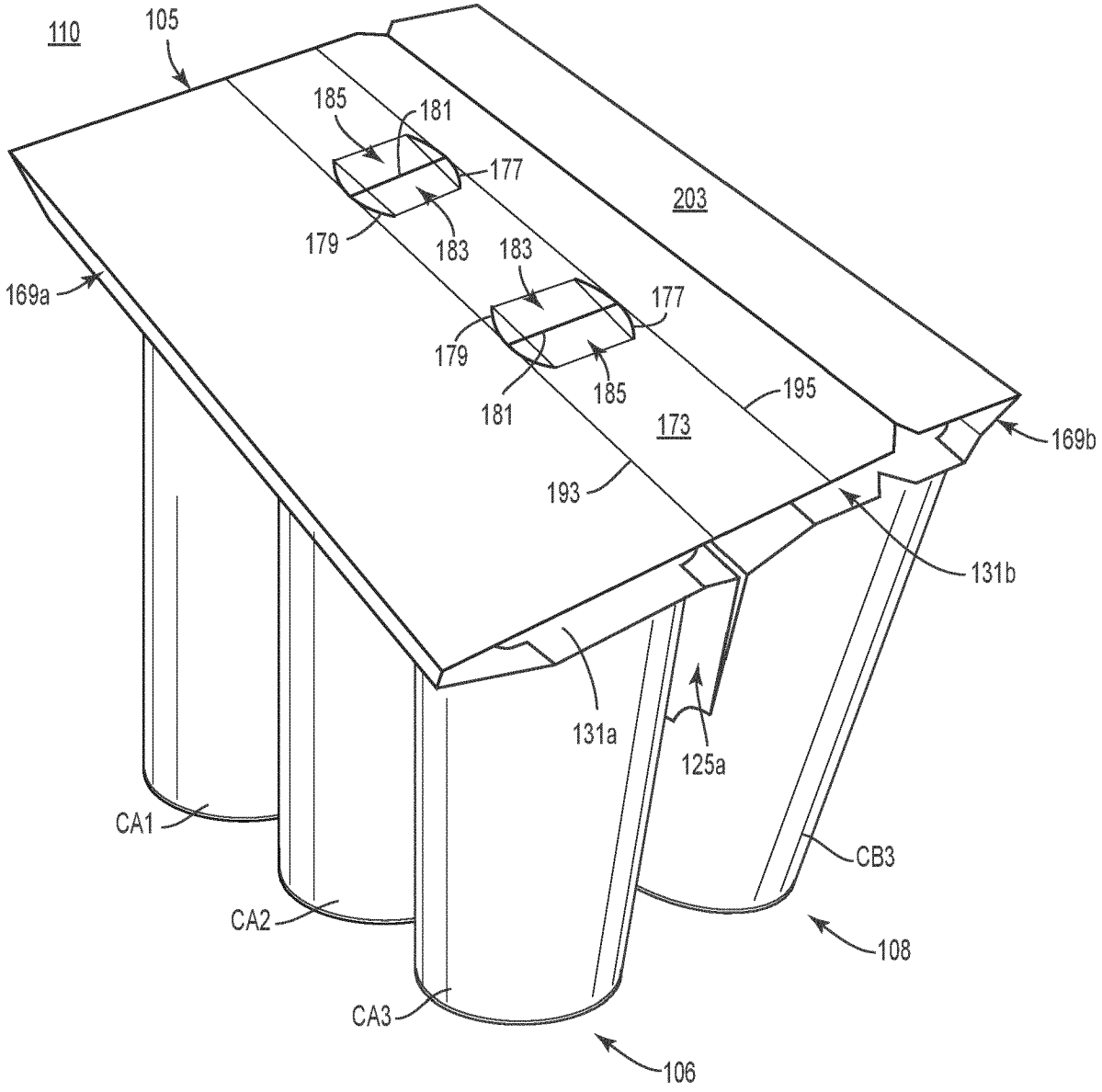

110
105
185
181
177
203
179
183
183
177
169a
179
185
181
195
173
169b
193
131b
131a
125a
CA1
CB3
CA2
108
CA3
106

FIG. 7

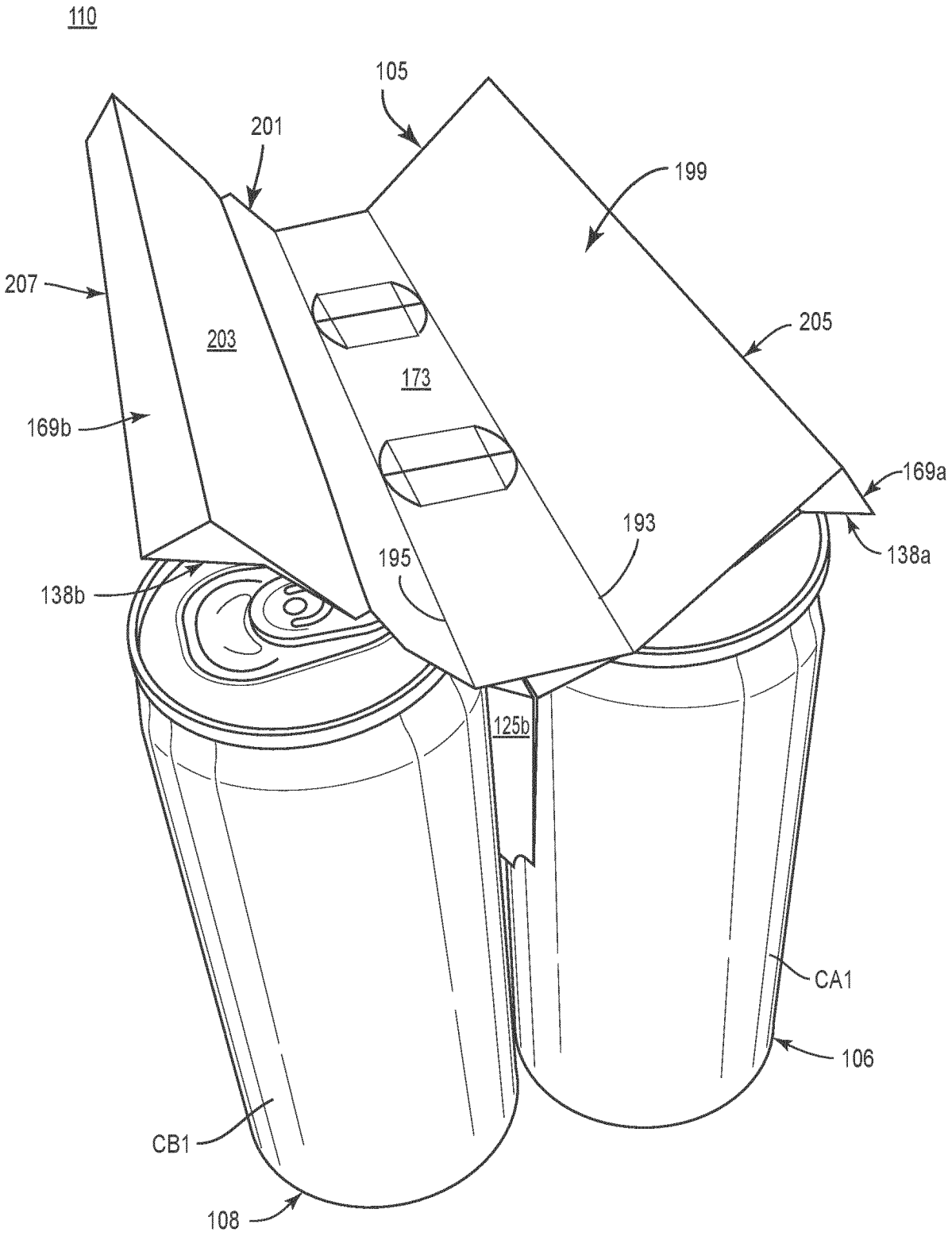

110
105
201
199
207
203
205
173
169b
169a
193
195
138a
138b
125b
CA1
106
CB1
108

FIG. 8

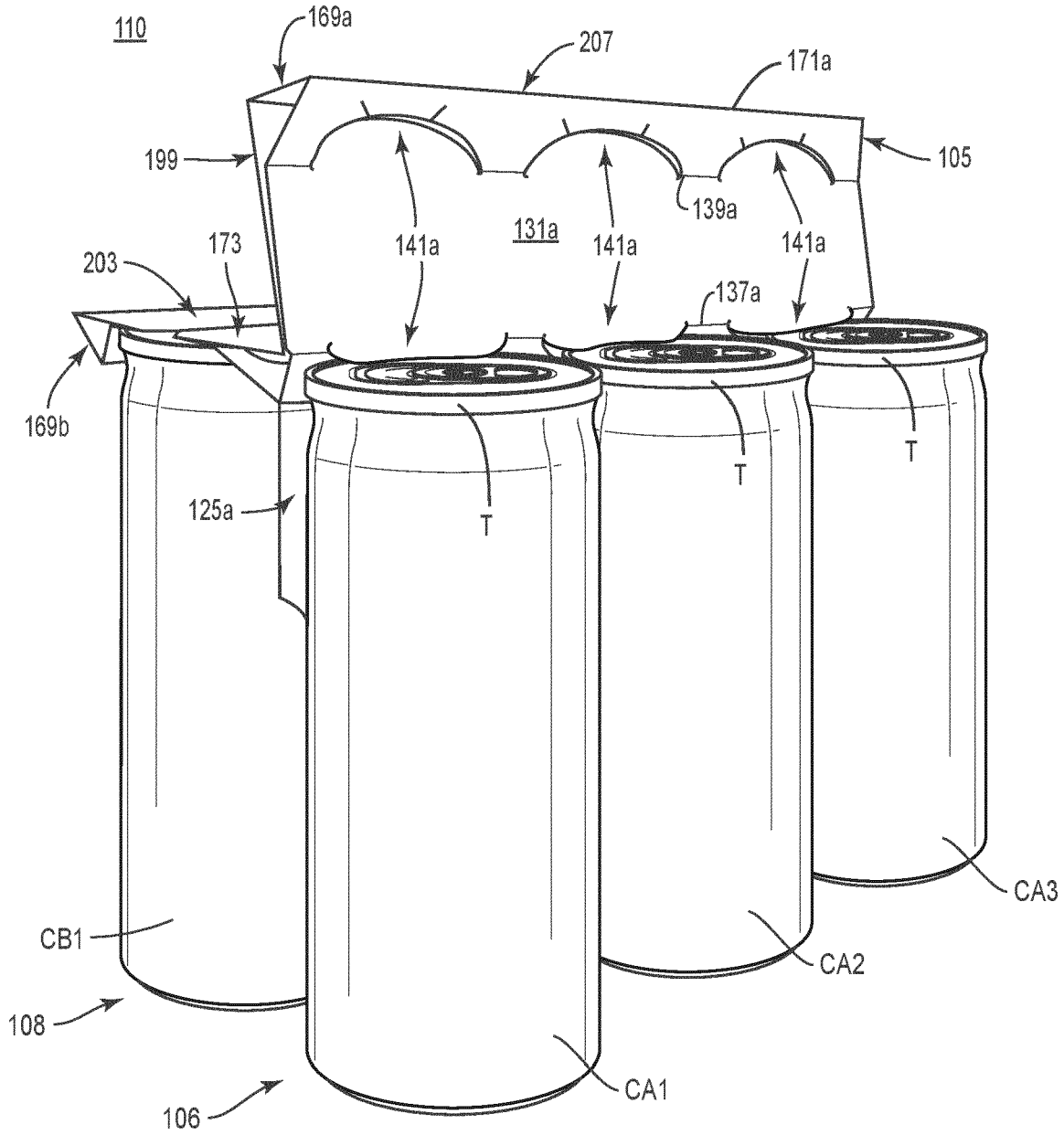

110
169a
207
171a
199
105
139a
131a
141a
141a
141a
173
203
137a
169b
T
T
T
125a
CB1
CA3
CA2
108
CA1
106

FIG. 9

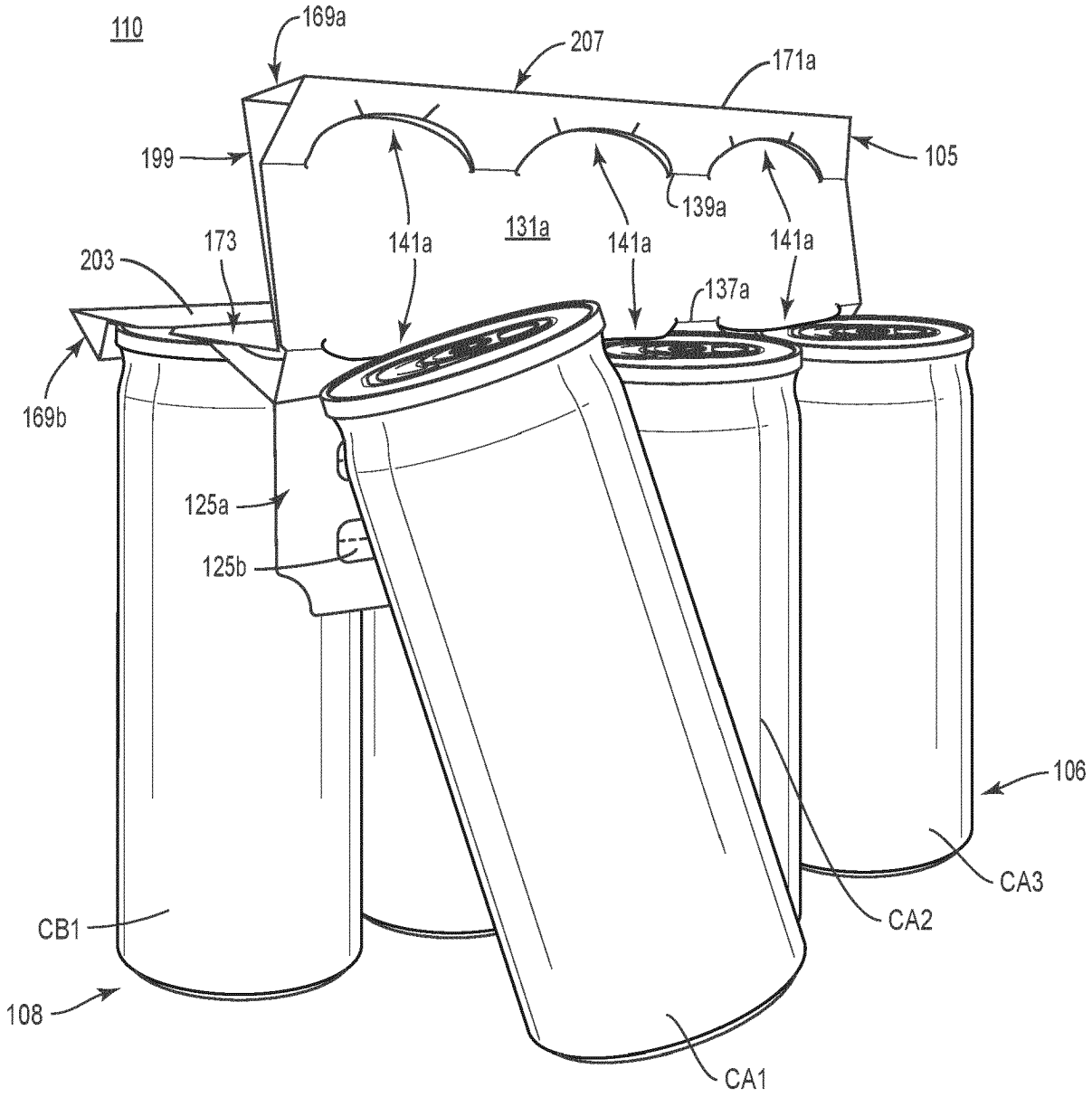

110
169a
207
171a
199
105
139a
131a
173
141a
141a
141a
203
137a
169b
125a
125b
106
CA3
CA2
CB1
108
CA1

FIG. 10

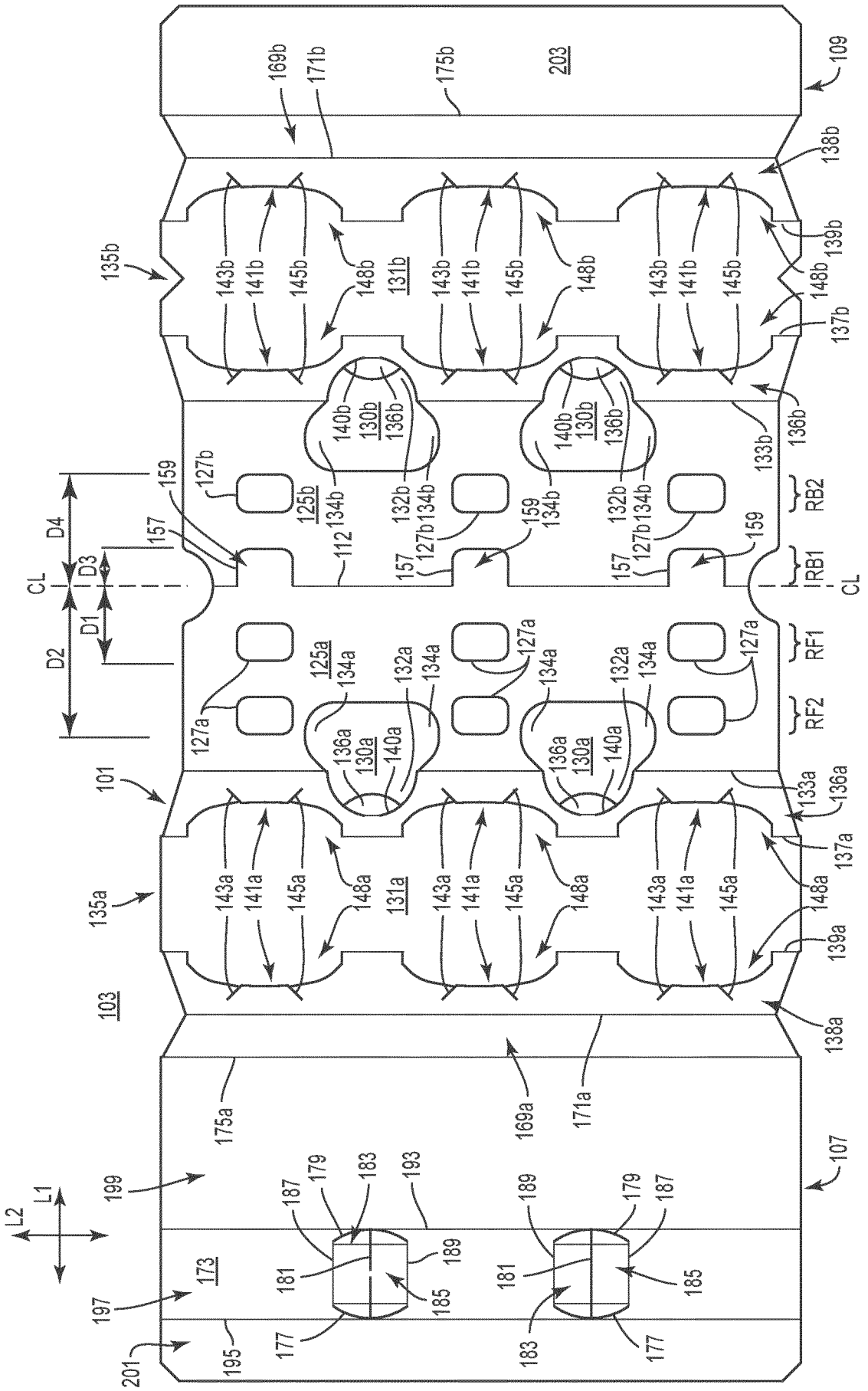

L2
L1
CL
D1
D2
D3
D4
RB1
RB2
RF1
RF2
101
103
107
109
112
131a
131b
135a
135b
138a
138b
139a
139b
173
197
199
201
203
125a
125b
127a
127b
133a
133b
136a
136b
137a
137b
140a
140b
143a
143b
145a
145b
148a
148b
157
159
169a
169b
171a
171b
175a
175b
177
179
181
183
185
187
189
193
195

FIG. 11

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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