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(54) **CARTON AND BLANK THEREFOR**

(57) Aspects of the disclosure relate to a carton for packaging one or more articles. The carton includes a tubular structure having a plurality of outer walls defining an interior volume for receiving one or more articles. The plurality of outer walls includes a top wall. The carton has a carrying handle. The carrying handle includes a first handle panel hingedly connected to the top wall by a first

hinged connection. The carrying handle includes a second handle panel hingedly connected to the first handle panel by a second hinged connection. The carrying handle includes a handle opening formed in at least one of the first and second handle panels. The carrying handle is foldable about the first and second hinged connections so as to be arranged in a stowed position over the top wall.

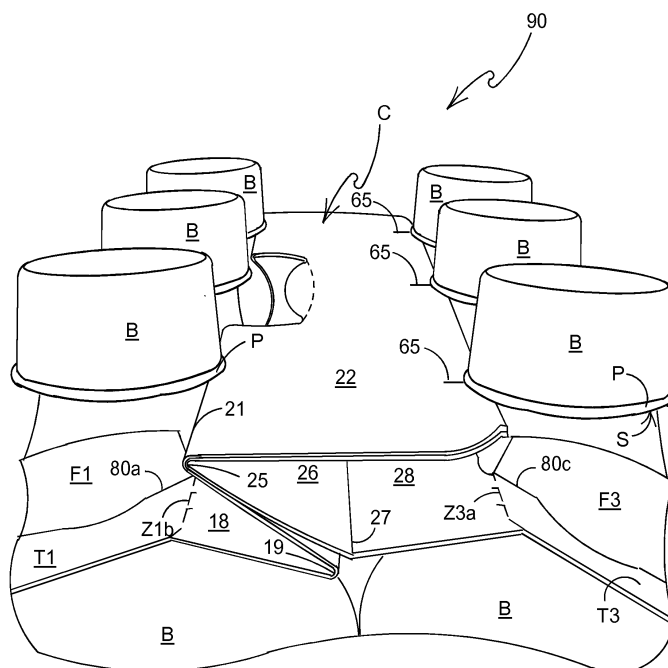


FIGURE 3

Description

TECHNICAL FIELD

[0001] The present invention relates to cartons and to blanks for forming the same. More specifically, but not exclusively, the invention relates to a carton of the wrap-around style, having a carrying handle for facilitating the transport of the first carrier.

BACKGROUND

[0002] In the field of packaging it is known to provide cartons for carrying multiple articles. Cartons are well known in the art and are useful for enabling consumers to transport, store and access a group of articles for consumption. Wrap-around style carriers typically have a plurality of walls including a pair of opposed side walls, a top wall and a bottom wall; one of the plurality of walls may be formed as a composite wall from two panels secured together. For cost and environmental considerations, such cartons or carriers need to be formed from as little material as possible and cause as little wastage in the materials from which they are formed as possible. Further considerations are the strength of the carrier; its suitability for holding and transporting large weights of articles; and the aesthetic appeal of the carrier which, if eye-catching and appealing to a consumer, may promote increased sales.

[0003] The present invention seeks to provide an improvement in the field of cartons, typically formed from paperboard or the like.

SUMMARY

[0004] According to a first aspect of the present disclosure there is provided a package comprising a plurality of articles arranged in at least two rows and a carton. The carton comprises a plurality of outer walls. The carton comprises a carrying handle. The carrying handle may comprise a first handle panel hingedly connected to one of the plurality of outer walls by a first hinged connection. The carrying handle may comprise a second handle panel hingedly connected to the first handle panel by a second hinged connection. The carrying handle may comprise a handle opening formed in at least one of the first and second handle panels. The carrying handle may be foldable about the first and second hinged connections so as to be arranged in a stowed position over the one of the plurality of outer walls.

[0005] Optionally, the one of the plurality of outer walls may be either a top wall or a partition wall for dividing an internal volume of the carton into at least two partitioned compartments. The top walls that may be associated with the handle of the present disclosure include, but not limited to, top walls of wraparound carriers, top walls of end-loading cartons, top walls of top-loading cartons, top walls of bottom-loading cartons and top walls of top-en-

gaging carriers. The partition walls that may be associated with the handle of the present disclosure include partition walls of basket style carriers.

[0006] Optionally, the second handle panel comprises a first edge defined by the second hinged connection and a second edge opposing the first edge, and wherein a portion of the first edge of the second handle panel engages with at least one of the articles in a first row of the at least two rows so as to secure the carrying handle in the stowed position.

[0007] Optionally, a portion of the second edge of the second handle panel engages with at least one of the articles in a second row of the at least two rows so as to secure the carrying handle in the stowed position.

[0008] Optionally, the second handle panel comprises a first edge defined by the second hinged connection and a second edge opposing the first edge, the second edge being part of an outer periphery of the second handle panel, and wherein a portion of the second edge of the second handle panel engages with at least one of the articles in one of the at least two rows so as to secure the carrying handle in the stowed position.

[0009] Optionally, the carrying handle comprises a deployed position in which at least a portion of the carrying handle is disposed at an elevation above the upper ends of the plurality of articles.

[0010] Optionally, in the deployed position, an upper edge of the handle opening is disposed at an elevation above the upper ends of the plurality of articles.

[0011] The second handle panel comprises a first edge defined by the second hinged connection and a second edge opposing the first edge. The carrying handle is foldable about the first and second hinged connections so as to be arranged in a stowed position above the one of the plurality of outer walls. A portion of the first edge of the second handle panel may engage with a flange of at least one article in a first row of articles. A portion of the second edge of the second handle panel may engage with a flange of at least one further article in a second row of articles so as to secure the carrying handle in the stowed position.

[0012] Optionally, the carrying handle comprises a deployed position; in the deployed position at least a portion of the carrying handle is disposed at an elevation above an upper end of the plurality of articles.

[0013] Optionally, when the carrying handle is disposed in the deployed position, an upper edge of the handle opening is disposed at an elevation above the upper end of the plurality of articles.

[0014] According to a second aspect of the present disclosure there is provided a carton for packaging one or more articles. The carton comprises plurality of outer walls. The carton comprises a carrying handle. The carrying handle may comprise a first handle panel hingedly connected to one of the plurality of outer walls by a first hinged connection. The carrying handle may comprise a second handle panel hingedly connected to the first handle panel by a second hinged connection. The carrying

handle may comprise a handle opening formed in at least one of the first and second handle panels. The carrying handle may be foldable about the first and second hinged connections so as to be arranged in a stowed position over the one of the plurality of outer walls.

[0015] Optionally, the one of the plurality of outer walls is a partition wall for dividing an internal volume of the carton into at least two partitioned compartments.

[0016] In some embodiments, the carton comprises a tubular structure defining an interior volume for receiving one or more articles. A first top panel may form at least part of the top wall.

[0017] Optionally, the second handle panel comprises a first edge defined by the second hinged connection and a second edge opposing the first edge, and a portion of the first edge of the second handle panel is engageable with at least one article in a first row of articles, so as to secure the carrying handle in the stowed position when the carton is loaded with articles.

[0018] Optionally, a portion of the second edge of the second handle panel is engageable with at least one further article in a second row of articles so as to secure the carrying handle in the stowed position when the carton is loaded with articles.

[0019] Optionally, the second handle panel comprises a first edge defined by the second hinged connection and a second edge opposing the first edge, the second edge being part of an outer periphery of the second handle panel, and wherein a portion of the second edge of the second handle panel is engageable with at least one article in a row of articles so as to secure the carrying handle in the stowed position when the carton is loaded with articles.

[0020] Optionally, the one of the plurality of outer walls comprises a top wall which includes first and second top panels, wherein the first handle panel is hingedly connected to the first top panel by the first hinged connection, and wherein the carrying handle further comprises: a third handle panel hingedly connected to the second handle panel by a third hinged connection; a fourth handle panel hingedly connected to the third handle panel by a fourth hinged connection, the fourth handle panel hingedly connected to the second top panel by a fifth hinged connection, wherein the third handle panel is folded about the third hinged connection so as to be arranged in a face-to-face relationship with the second handle panel and the fourth handle panel is arranged in a face-to-face relationship with the first handle panel.

[0021] Optionally, the one of the plurality of outer walls comprises a top wall which includes a first and a second top panel, wherein the first handle panel is hingedly connected to the first top panel by the first hinged connection, and the carrying handle further comprises a third handle panel hingedly connected to the second handle panel by a third hinged connection, and a fourth handle panel hingedly connected to the third handle panel by a fourth hinged connection. The fourth handle panel is hingedly connected to the second top panel by a fifth hinged con-

nection; the third handle panel is folded about the third hinged connection so as to be arranged in a face-to-face relationship with the second handle panel, and the fourth handle panel is arranged in a face-to-face relationship with the first handle panel.

[0022] Optionally, the second edge of the second handle panel is defined by the third hinged connection.

[0023] Optionally, the carton comprises at least one relief structure, the at least one relief structure comprises a cutaway struck at least in part from the third handle panel, the cutaway being disposed proximate the third hinged connection, wherein a portion of the second handle panel proximate the cutaway is engageable with the at least one further article in a second row of articles.

[0024] Optionally, the relief structure comprises a severance line defined in the second handle panel.

[0025] Optionally, the severance line extends into the second handle panel substantially perpendicularly from the second edge of the second handle panel.

[0026] According to a third aspect of the present disclosure there is provided a blank for forming a carton. The blank comprises a plurality of panels for forming outer walls. The blank comprises a plurality of panels for forming a carrying handle. The carrying handle may comprise a first handle panel hingedly connected to one of the plurality of panels for forming the outer walls by a first hinged connection. The carrying handle may comprise a second handle panel hingedly connected to the first handle panel by a second hinged connection. The carrying handle may comprise a handle opening formed in at least one of the first and second handle panels. When the blank is in an assembled condition, the carrying handle is foldable about the first and second hinged connections so as to be arranged in a stowed position over the one of the plurality of panels for forming the outer walls.

[0027] Optionally, the plurality of panels for forming outer walls and the plurality of panels for forming a carrying handle are hingedly connected together in a linear series.

[0028] Optionally, the blank is configured to form a wrap-around carton and the blank includes a pair of base panels for being disposed in at least a partially overlapping relationship.

[0029] In some embodiments, the blank is configured to form a wraparound carton or a basket carrier, and the blank includes at least one base panel.

[0030] Optionally, the one of the plurality of panels for forming the outer walls includes a first top panel, the plurality of panels for forming the outer walls further includes a second top panel, and wherein the plurality of panels for forming the carrying handle further comprises: a third handle panel hingedly connected to the second handle panel by a third hinged connection; and a fourth handle panel hingedly connected to the third handle panel by a fourth hinged connection, the fourth handle panel being hingedly connected to the second top panel by a fifth hinged connection, wherein the third handle panel is folded about the third hinged connection so as to be arranged

in a face-to-face relationship with the second handle panel and the fourth handle panel is arranged in a face-to-face relationship with the first handle panel.

[0031] Optionally, the plurality of panels for forming the carrying handle further comprise at least one relief structure, the at least one relief structure comprising a cutaway struck at least in part from the third handle panel, the cutaway being disposed proximate the third hinged connection, and wherein a portion of the second handle panel proximate the cutaway is engageable with at least one article to be received in a carton formed from the blank.

[0032] Optionally, the at least one relief structure comprises a severance line defined in the second handle panel.

[0033] Optionally, the second handle panel has first and second opposed edges, the first edge of the second handle panel being defined by the second hinged connection, the second edge of the second handle panel being defined by the third hinged connection, and wherein the severance line extends in the second handle panel substantially perpendicularly from the second edge of the second handle panel.

[0034] According to a fourth aspect of the present disclosure there is provided a package comprising a plurality of articles arranged in at least two rows and a carton. The carton comprises a tubular structure having a plurality of outer walls defining an interior volume for receiving one or more articles. The plurality of outer walls may include at least one top wall. The carton comprises a carrying handle. The carrying handle may comprise a first handle panel hingedly connected to a first top panel forming at least part of the top wall by a first hinged connection. The carrying handle may comprise a second handle panel hingedly connected to the first handle panel by a second hinged connection. The second handle panel comprises a first edge defined by the second hinged connection and a second edge opposing the first edge. The carrying handle is foldable about the first and second hinged connections so as to be arranged in a stowed position above the top wall. A portion of the first edge of the second handle panel may engage with a flange of at least one article in a first row of articles. A portion of the second edge of the second handle panel may engage with a flange of at least one further article in a second row of articles so as to secure the carrying handle in the stowed position.

[0035] Optionally, the carrying handle comprises a deployed position; in the deployed position at least a portion of the carrying handle is disposed at an elevation above an upper end of the plurality of articles.

[0036] Optionally, when the carrying handle is disposed in the deployed position, an upper edge of the handle opening is disposed at an elevation above the upper end of the plurality of articles.

[0037] Within the scope of this application it is envisaged and intended that the various aspects, embodiments, examples, features and alternatives set out in the preceding paragraphs, in the claims and/or in the follow-

ing description and drawings may be taken independently or in any combination thereof. For example, features described in connection with one embodiment are applicable to all embodiments unless there is incompatibility of features.

BRIEF DESCRIPTION OF THE DRAWINGS

[0038] Exemplary embodiments of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1A is a plan view from above of a blank for forming a first carrier according to a first embodiment;

Figure 1B is an enlarged view from above of a portion of the blank of Figure 1A;

Figure 2 is a perspective view from above of a carton formed from the blank of Figure 1;

Figure 3 is a perspective view of an upper portion of the carton of Figure 2A;

Figure 4 is an enlarged view from above of a portion of the carton of Figure 3;

Figure 5 is a partial view of a portion of the carton of Figure 4 from below.

Figure 6 is a perspective view from above of the carton of Figure 2 showing a carrying handle in a deployed position; and

Figure 7 is a perspective view of an upper portion of the carton of Figure 6 showing the carrying handle in use.

DETAILED DESCRIPTION OF EMBODIMENTS

[0039] Detailed descriptions of specific embodiments of the package, blanks and carriers are disclosed herein. It will be understood that the disclosed embodiments are merely examples of the way in which certain aspects of the invention can be implemented and do not represent an exhaustive list of all of the ways the invention may be embodied. As used herein, the word "exemplary" is used expansively to refer to embodiments that serve as illustrations, specimens, models, or patterns. Indeed, it will be understood that the packages, blanks and carriers described herein may be embodied in various and alternative forms. The Figures are not necessarily to scale and some features may be exaggerated or minimised to show details of particular components. Well-known components, materials or methods are not necessarily described in great detail in order to avoid obscuring the present disclosure. Any specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the invention.

[0040] Referring to Figure 1, there is shown a plan view of a blank 10 capable of forming a carton or carrier 90 having a carrying handle 'C', as shown in Figure 2, for

containing and carrying a group of primary products such as, but not limited to, bottles or cans, hereinafter referred to as articles B. The blank 10 forms a secondary package for packaging at least one primary product container or package.

[0041] In the embodiments detailed herein, the terms "carton" and "carrier" refer, for the non-limiting purpose of illustrating the various features of the invention, to a container for engaging and carrying articles, such as primary product containers. It is contemplated that the teachings of the invention can be applied to various product containers, which may or may not be tapered and/or cylindrical. Exemplary containers include bottles (for example metallic, glass or plastics bottles), cans (for example aluminium cans), tins, pouches, packets and the like.

[0042] The blank 10 is formed from a sheet of suitable substrate. It is to be understood that, as used herein, the term "suitable substrate" includes all manner of foldable sheet material such as paperboard, corrugated board, cardboard, plastic, combinations thereof, and the like. It should be recognised that one or other numbers of blanks may be employed where suitable, for example, to provide the carrier structure described in more detail below.

[0043] In the illustrated embodiment, the blank 10 is configured to form a carton or carrier 90 for packaging an exemplary arrangement of exemplary articles. In the illustrated embodiment, the arrangement is a 2 x 3 matrix or array; in the illustrated embodiment two rows of three articles are provided and the articles are bottles. Alternatively, the blank 10 can be configured to form a carrier for packaging other types, number and size of articles and/or for packaging articles in a different arrangement or configuration.

[0044] Referring to Figure 1, the blank 10 comprises a plurality of main panels 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34 for forming outer walls of a wrap-around style carrier 90 (see Figure 2). The plurality of main panels 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34 includes a first base panel 12 and a second base panel 34. The first base panel 12 is hinged to a first lower side panel 14 by a hinged connection such as a fold line 13. The first lower side panel 14 is hinged to a first upper side panel 16 by a hinged connection such as a fold line 15. The first upper side panel 16 is hinged to a first top panel 18 by a hinged connection such as a fold line 17. The first top panel 18 is hinged to a first handle panel 20 by a hinged connection such as a fold line 19. The first handle panel 20 is hinged to a second handle panel 22 by a hinged connection such as a fold line 21. The second handle panel 22 is hinged to a third handle panel 24 by a hinged connection such as a fold line 23. The third handle panel 24 is hinged to a fourth handle panel 26 by a hinged connection such as a fold line 25. The fourth handle panel 26 is hinged to a second top panel 28 by a hinged connection such as a fold line 27. The second top panel 28 is hinged to a second upper side panel 30 by a hinged connection such as a fold line 29. The second upper side panel 30 is hinged to a second lower side panel 32 by a hinged connection

such as a fold line 31. The second lower side panel 32 is hinged to the second base panel 34 by a hinged connection such as a fold line 33.

[0045] Optionally, the first lower side panel 14 comprises a first fold line 13a; the first fold line 13a and the fold line 13 define a first bevel panel 14a therebetween. Optionally, the first lower side panel 14 comprises a second fold line 13b; the second fold line 13b and the first fold line 13a define a second bevel panel 14b therebetween.

[0046] Optionally, the second lower side panel 32 comprises a third fold line 33a; the third fold line 33a and the fold line 33 define a third bevel panel 32a therebetween. Optionally, the second lower side panel 32 comprises a fourth fold line 33b; the third fold line 33a and the fourth fold line 33b define a fourth bevel panel 32b therebetween.

[0047] The first base panel 12 and the second base panel 34 together form a composite base wall of the carrier 90.

[0048] The first base panel 12 comprises a first part F of a complementary securing mechanism. The second base panel 34 comprises a second part M of a complementary securing mechanism. The first part F of the complementary securing mechanism comprises an opening for receiving the second part M. Optionally, the opening is defined at least in part by a foldable tab struck from and hinged to the first base panel 12. The second part M of the complementary securing mechanism comprises a tab for insertion into the opening of the first part F. The tab comprises at least one shoulder for engaging with the first base panel 12 when inserted into the opening of the first part F. In the illustrated embodiment the first base panel 12 comprises six first parts F and the second base panel 34 comprises six second parts M.

[0049] The blank 10 comprises a plurality of lower retention structures L. In the illustrated embodiment the blank 10 comprises six lower article retention structures L; three lower article retention structures L are provided in the first lower side panel 14 and the first base panel 12, and a further three lower article retention structures L are provided in the second lower side panel 32 and second base panel 34. Each of the lower retention structures L are substantially similar in construction and will be described by reference to the lower retention structures L shown in Figure 1A.

[0050] Each lower retention structure L comprises two tabs 40, 42. First tab 40 comprises two components: an upper portion and a lower portion hinged thereto by a hinged connection defined by a cutline 47a.

[0051] Second tab 42 comprises two components: an upper portion and a lower portion hinged thereto by a hinged connection defined by a cutline 47b.

[0052] First and second tabs 40, 42 are hinged to the blank 10 along hinged connections such as fold lines 41, 43 respectively. Optionally, each fold line 41, 43 is non-linear, for example comprising two or more linear sections divergently arranged with respect to each other. In

other embodiments the fold lines 41, 43 may be arcuate.

[0053] Optionally, the fold lines fold line 41, 43 comprise two linear sections defining an angle therebetween as shown in Figure 1A.

[0054] Fold lines 41 and 43 are arranged to be convergent, at least in part, with respect to one another.

[0055] Fold lines 47a and 47b are arranged to be convergent with respect to one another.

[0056] First and second tabs 40, 42 are struck at least in part from material forming the first lower side wall panel 14.

[0057] In embodiments having the first and second bevel panels 14a, 14b, the lower portions of the first and second tabs 40, 42 may be struck from material forming the first bevel panel 14a. The upper portions of the first and second tabs 40, 42 may be struck at least in part from material forming the second bevel panel 14b.

[0058] First tab 40 is separated from second tab 42 by a cut line or severance line 45.

[0059] The lower article retention structures L may further comprise a first, lower, aperture A1 disposed adjacent to and defining a lower edge of each of the first and second tabs 40, 42. The first, lower, aperture A1 is struck at least in part from the first base panel 12.

[0060] The lower article retention structures L may also comprise a second, upper, aperture A2 disposed adjacent to and defining an upper edge of each of the first and second tabs 40, 42. The second, upper, aperture A2 is struck at least in part from the first lower side panel 14.

[0061] The second, upper, aperture A2 may be struck in part from the second bevel panel 14b

[0062] The first, lower, aperture A1 may comprise a substantially V-shaped portion wherein the vertex of the aperture A1 is disposed closest to a free edge of base panel 12 opposing an edge comprising the hinged connection to the first lower side panel 14. These V-shaped portions may be engaged by machine tools for facilitating assembly and/or alignment of the carton 90.

[0063] The blank 10 comprises a pair of handle structures H. A first handle structure is struck in part from the first handle panel 20 and in part from the second handle panel 22. A second handle structure is struck in part from the third handle panel 24 and in part from the fourth handle panel 26.

[0064] Each of the handle structures H are substantially the same in construction and will be described in further detail by reference to the first handle structure struck from the first and second handle panels 20, 22. The handle structure H comprises a handle opening A6; handle opening A6 is struck in part from the first handle panel 20 and in part from the second handle panel 22 so as to interrupt the fold line 21 serving as the hinged connection between the first and second handle panels 20, 22.

[0065] The handle structure H comprises a first cushioning flap 62 struck from the second handle panel 22. The first cushioning flap 62 is hinged to the second handle panel 22 by a hinged connection in the form of a fold line

61.

[0066] The blank 10 comprises a first article receiving aperture A3 struck in part from the first upper side panel 16 and in part from the first top panel 18. The first article receiving aperture A3 is defined in part by a first flap F1. First flap F1 is hingedly connected to a first tear strip T1 by a fold line 80a. Optionally, fold line 80a is interrupted by a first cutline 82a; first cutline 82a is optionally curvilinear or arcuate in shape. First tear strip T1 is defined in part by a first weakened line or severance line Z1a and in part by a second weakened line or severance line Z1b. The first flap F1 and the first article receiving aperture A3 together define an opening for receiving an upper portion of an article B.

[0067] The blank 10 comprises a second article receiving aperture A4 struck in part from the first upper side panel 16 and in part from the first top panel 18.

[0068] The blank 10 comprises a third article receiving aperture A5 struck in part from the first upper side panel 16 and in part from the first top panel 18. The third article receiving aperture A5 is defined in part by a second flap F2. Second flap F2 is hingedly connected to a second tear strip T2 by a fold line 80b. Optionally, fold line 80b is interrupted by a second cutline 82b; second cutline 82b is optionally curvilinear or arcuate in shape. Second tear strip T2 is defined in part by a third weakened line or severance line Z2a and in part by a fourth weakened line or severance line Z2b. The second flap F2 and the third article receiving aperture A5 together define an opening for receiving an upper portion of an article B.

[0069] The blank 10 comprises a fourth article receiving aperture A8 struck in part from the second upper side panel 30 and in part from the second top panel 28. The fourth article receiving aperture A8 is defined in part by a third flap F3. Third flap F3 is hingedly connected to a third tear strip T3 by a fold line 80c. Optionally, fold line 80c is interrupted by a third cutline 82c; third cutline 82c is optionally curvilinear or arcuate in shape. Third tear strip T3 is defined in part by a fifth weakened line or severance line Z3a and in part by a sixth weakened line or severance line Z3b. The third flap F3 and the third article receiving aperture A8 together define an opening for receiving an upper portion of an article B.

[0070] The blank 10 comprises a fifth article receiving aperture A9 struck in part from the second upper side panel 30 and in part from the second top panel 28.

[0071] The blank 10 comprises a sixth article receiving aperture A10 struck in part from the second upper side panel 30 and in part from the second top panel 28. The sixth article receiving aperture A10 is defined in part by a fourth flap F4. Fourth flap F4 is hingedly connected to a third tear strip T4 by a fold line 80d. Optionally, fold line 80d is interrupted by a fourth cutline 82d; fourth cutline 82d is optionally curvilinear or arcuate in shape. Fourth tear strip T4 is defined in part by a seventh weakened line or severance line Z4a and in part by an eighth weakened line or severance line Z4b. The fourth flap F4 and the third article receiving aperture A10 together define

an opening for receiving an upper portion of an article B.

[0072] A first frangible line 51 a extends between the first article receiving aperture A3 and the second article receiving aperture A4.

[0073] A first tab 50a is defined in part by the first frangible line 51 a and in part by the fold line 17 between the first and second article receiving apertures A3, A4. First tab 50a may be at least partially severable from the carton 90 for enabling access to an article B.

[0074] A second frangible line 51 b extends between the second article receiving aperture A4 and the third article receiving aperture A5.

[0075] A second tab 50b is defined in part by the second frangible line 51 b and in part by the fold line 17 between the second and third article receiving apertures A4, A5. Second tab 50b may be at least partially severable from the carton 90 for enabling access to an article B.

[0076] A third frangible line 51c extends between the fourth article receiving aperture A8 and the fifth article receiving aperture A9.

[0077] A third tab 50c is defined in part by the third frangible line 51c and in part by the fold line 29 between the fourth and fifth article receiving apertures A8, A9. Third tab 50c may be at least partially severable from the carton 90 for enabling access to an article B.

[0078] A fourth frangible line 51d extends between the fifth article receiving aperture A9 and the sixth article receiving aperture A10.

[0079] A fourth tab 50d is defined in part by the fourth frangible line 51d and in part by the fold line 29 between the fifth and sixth article receiving apertures A9, A10. Fourth tab 50d may be at least partially severable from the carton 90 for enabling access to an article B.

[0080] The first top panel 18 comprises a first oblique fold line 70a extending from a first free end edge of the first top panel 18 towards the fold line 19.

[0081] The first handle panel 20 comprises a second oblique fold line 70b extending from a first free end edge of the first handle panel 20 towards the fold line 19.

[0082] The first and second oblique fold lines 70a, 70b are convergently arranged with respect to each other and form a vertex disposed on the fold line 19.

[0083] The first top panel 18 comprises a third oblique fold line 70c extending from a second free end edge of the first top panel 18 towards the fold line 19.

[0084] The first handle panel 20 comprises a fourth oblique fold line 70d extending from a second free end edge of the first handle panel 20 towards the fold line 19.

[0085] The third and fourth oblique fold lines 70c, 70d are convergently arranged with respect to each other and form a vertex disposed on the fold line 19.

[0086] The fourth handle panel 26 comprises a fifth oblique fold line 72a extending from a first free end edge of the fourth handle panel 26 towards the fold line 27.

[0087] The second top panel 28 comprises a sixth oblique fold line 72b extending from a first free end edge of the second top panel 28 towards the fold line 27.

[0088] The fifth and sixth oblique fold lines 72a, 72b

are convergently arranged with respect to each other and form a vertex disposed on the fold line 27.

[0089] The fourth handle panel 26 comprises a seventh oblique fold line 72c extending from a second free end edge of the fourth handle panel 26 towards the fold line 27.

[0090] The second top panel 28 comprises an eighth oblique fold line 72d extending from a second free end edge of the second top panel 28 towards the fold line 27.

[0091] The seventh and eighth oblique fold lines 72c, 72d are convergently arranged with respect to each other and form a vertex disposed on the fold line 27.

[0092] The blank 10 comprises at least one relief structure R; in the illustrated embodiment a plurality of relief structures R are provided. The arrangement of Figure 1A shows three relief structures R; in other embodiments more or less relief structures may be provided.

[0093] Optionally, the number of relief structures R provided corresponds to the number of articles B in one of the rows of articles B.

[0094] Each of the relief structures R is substantially the same in construction and will be described in further detail by reference to the relief structure R shown in Figure 1B.

[0095] Figure 1B shows an enlarged view of a relief structure R. The relief structure R comprises a cutaway in the form of a relief aperture A7 struck from the third handle panel 24. The relief aperture A7 optionally takes the form of a segment of a circle. In other embodiments the relief aperture A7 may be other shapes, for example but not limited to semicircular, trapezoidal or triangular. The relief aperture A7 interrupts the hinged connection between the second and third handle panels 22, 24.

[0096] The aperture A7 comprises an edge 63; optionally edge 63 is linear and may also be collinearly arranged with the fold line 23.

[0097] The relief structure R comprises a severance line or slit 65 extending from an edge 63 of the relief aperture A7 into the second handle panel 22. Optionally the slit 65 is centrally disposed with respect to the edge 63 of the relief aperture A7. In the illustrated embodiment the severance line 65 is formed from a full depth cutline, that is to say a cutline through the entire thickness of the material from which the blank 10 is formed. In other embodiments the severance line may be a frangible connection which is severable in use. In other embodiments the severance line may be omitted.

[0098] Turning to the construction of the carrier 90 from the blank 10, the carrier 90 may be formed by a series of sequential folding operations in a straight line machine so that the carrier 90 may not be required to be inverted to complete its construction.

[0099] Glue or other adhesive treatment is applied to an inner surface of the first and second handle panels 20, 22. In other embodiments glue or other adhesive treatment is applied to an inner surface of the third and fourth handle panels 24, 26.

[0100] The blank 10 is then folded about the fold line

23 so as to bring the third and fourth handle panels 24, 26 into face contacting relationship with the respective one of the first and second handle panels 20, 22.

[0101] The first handle panel 20 is secured to the fourth handle panel 26. The second handle panel 22 is secured to the third handle panel 24.

[0102] The blank 10 can be shipped or distributed in this form to a conversion plant where the blank 10 is erected about a group of articles B.

[0103] The blank 10 is folded about fold line 19 and fold line 27 such that the first top panel 18, first upper side panel 16, first lower side panel 14 and first base panel 12 are separated from the second top panel 28, second upper side panel 30, second lower side panel 32 and second base panel 34.

[0104] Each of the lower article retention structures L are opened, and the first tabs 40 are folded internally of the carton 90 about fold lines 41. Each of the second tabs 42 are folded internally of the carton 90 about fold lines 43.

[0105] The first and second base panels 12, 34 of the blank 10 are folded about fold lines 13, 33 respectively, with the lower article retention structures L in an open condition. The first and second tabs 40, 42 are folded about the fold lines 47a, 47b respectively.

[0106] The blank 10 may be folded about the optional fold lines 13a, 13b, 33a, 33b when provided.

[0107] The blank 10 is then conveyed to a group of articles B with the lower article retention structures L in an open condition.

[0108] The carton 90 is constructed about a group of articles B by placing the first and second top panels 18, 28 over the group of articles B and by folding the first and second upper side wall panels 16, 30 about the group of articles B by folding about respective fold lines 19, 27.

[0109] The fold lines 15, 31, which are optional, when provided allow the lower side wall panels 14, 32 to be folded about the lower regions of the group of articles A.

[0110] The first and second base panels 12, 34 are then brought about the base of the group of articles B.

[0111] Each of the lower article retention structures L receives a portion of a respective article B in an opening created by folding the first and second tabs 40, 42 internally of the carton 90. Each of the first tabs 40 substantially engages with a first side of an article B and each of the second tabs 42 substantially engages with a second side of an article B.

[0112] The first and second base panels 12, 34 are brought into at least partial overlapping arrangement such that male tabs M may be inserted through apertures in the first base panel 12 defined by female tabs F thus securing the first and second base panels 12, 34 together. Optionally, the second base panel 34 is disposed innermost.

[0113] In other embodiments alternative mechanical securing devices, such as but not limited to staples, may be employed; in still other embodiments an adhesive or other treatment may be applied to the blank 10 such that

the first and second base panels 12, 34 are bonded or welded together.

[0114] The first, second, third and fourth handle panels 20, 22, 24, 26, together with the handle structures H, form a carrying handle C.

[0115] The assembled carton 90 is shown in Figures 2 and 3.

[0116] The carrying handle C is disposed in a first, stowed, position. The first handle panel 20 is folded about fold line 19 such that the first handle panel 20 and at least a portion of the fourth handle panel 26 are disposed over the first top panel 18. The second and third handle panels 22, 24 are folded about fold lines 21, 25 respectively such that portions of the second and third handle panels 22, 24 are disposed over the first and fourth handle panels 20, 26 and portions of the second and third handle panels 22, 24 are disposed over the second top panel 28.

[0117] A first edge of the second handle panel 22 defined by the fold line 21 is arranged to be disposed below a lip or flange P projecting from the articles B in a first row.

[0118] A second edge of the second handle panel 22 defined by the fold line 23 is arranged to be disposed below a lip or flange P projecting from the articles B in a second adjacent row.

[0119] The relief structures R are arranged to be adjacent to an article B in the second, adjacent, row of articles B. The slit 65 and the relief aperture A7 facilitate engagement of the second handle panel 22 with the articles B. The relief aperture A7 reduces the number of plies of material proximate the flange P of the article B. The slit 65 facilitates the second handle panel 22 to undergo a local deformation when being engaged or disengaged with the articles B in the second row of articles B. In this way the carrying handle C can be more easily moved from the first, stowed, position shown in Figures 2 to 4 to a second, deployed, position shown in Figures 6 and 7.

[0120] Figures 6 and 7 show the carrying handle C in the second, deployed, position. The carrying handle has been unfolded or moved from the first, stowed, position to the second, deployed, position.

[0121] In the first, stowed, position the carrying handle C is arranged so as to be below the upper ends of the articles. The carton 90 can be more easily stacked when the carrying handle C is in the stowed position. The carrying handle C is stored in the gap or void between the first and second rows of articles B.

[0122] In the second, deployed, position the carrying handle C can be readily engaged by a user U, see Figure 7. At least a portion of the carrying handle C is disposed at an elevation above the upper ends of the articles B. In this way the user U does not need to place their hand in the gap or void between the first and second rows of articles B.

[0123] Figure 7 illustrates a user U employing the carrying handle C. The user inserts one or more fingers through the opening provided by the handle apertures A6 in the second and third handle panels 22, 24. The

opening may be formed in part by displacing the optional cushioning flaps 62 out of the plane of the respective one of the second and third handle panels 22, 24 to which they are hinged.

[0124] The articles B may be tapered or reduced in diameter at a one, upper, end thereof. This reduction in article diameter may increase the size of the void between the first and second rows of articles B.

[0125] The carrying handle C, when in the stowed position, may provide the additional advantage of reducing movement of at least the upper portions of the articles B within the carton 90. This may reduce the likelihood of damage to the primary product containers from impacts between two or more articles B. In this way the carrying handle C forms a support or brace between at least two articles B.

[0126] In the deployed position the first and second top panels 18, 28 may be displaced upwardly proximate fold line 19 and fold line 27. In this way, first and second top panels 18, 28 may define an inverted "V" shape. This displacement of the first and second top panels 18, 28 may facilitate tightening of the carton 90 about the articles B when the carton 90 is transported by the carrying handle C. This may reduce the likelihood of damage to the primary product containers from impacts between two or more articles B.

[0127] It will be recognised that as used herein, directional references such as "top", "bottom", "base", "front", "back", "end", "side", "inner", "outer", "upper" and "lower" do not necessarily limit the respective panels to such orientation, but may merely serve to distinguish these panels from one another.

[0128] As used herein, the terms "hinged connection" and "fold line" refer to all manner of lines that define hinge features of the blank, facilitate folding portions of the blank with respect to one another, or otherwise indicate optimal panel folding locations for the blank. Any reference to "hinged connection" should not be construed as necessarily referring to a single fold line only; indeed a hinged connection can be formed from two or more fold lines wherein each of the two or more fold lines may be either straight/linear or curved/curvilinear in shape. When linear fold lines form a hinged connection, they may be disposed parallel with each other or slightly angled with respect to each other. When curvilinear fold lines form a hinged connection, they may intersect each other to define a shaped panel within the area surrounded by the curvilinear fold lines. A typical example of such a hinged connection may comprise a pair of arched or arcuate fold lines intersecting at two points such that they define an elliptical panel therebetween. A hinged connection may be formed from one or more linear fold lines and one or more curvilinear fold lines. A typical example of such a hinged connection may comprise a combination of a linear fold line and an arched or arcuate fold line which intersect at two points such that they define a half moon-shaped panel therebetween.

[0129] As used herein, the term "fold line" may refer to

one of the following: a scored line, an embossed line, a debossed line, a line of perforations, a line of short slits, a line of half-cuts, a single half-cut, an interrupted cut line, a line of aligned slits, a line of scores and any combination of the aforesaid options.

[0130] It should be understood that hinged connections and fold lines can each include elements that are formed in the substrate of the blank including perforations, a line of perforations, a line of short slits, a line of half-cuts, a single half-cut, a cut line, an interrupted cut line, slits, scores, any combination thereof, and the like. The elements can be dimensioned and arranged to provide the desired functionality. For example, a line of perforations can be dimensioned or designed with degrees of weakness to define a fold line and/or a severance line. The line of perforations can be designed to facilitate folding and resist breaking, to facilitate folding and facilitate breaking with more effort, or to facilitate breaking with little effort.

[0131] The phrase "in registry with" as used herein refers to alignment of two or more elements in an erected carton, such as an aperture formed in a first of two overlapping panels and a second aperture formed in a second of two overlapping panels. Those elements in registry with each other may be aligned with each other in the direction of the thickness of the overlapping panels. For example, when an aperture in a first panel is "in registry with" a second aperture in a second panel that is placed in an overlapping arrangement with the first panel, and an edge of the aperture may extend along at least a portion of an edge of the second aperture and may be aligned, in the direction of the thickness of the first and second panels, with the second aperture.

Claims

1. A carton for packaging one or more articles comprising:

a plurality of outer walls; and
a carrying handle, the carrying handle comprising:

a first handle panel hingedly connected to one of the plurality of outer walls by a first hinged connection;
a second handle panel hingedly connected to the first handle panel by a second hinged connection; and
a handle opening formed in at least one of the first and second handle panels,

wherein the carrying handle is foldable about the first and second hinged connections so as to be arranged in a stowed position over the one of the plurality of outer walls.

2. A carton according to claim 1 wherein the one of the plurality of outer walls is a partition wall for dividing an internal volume of the carton into at least two partitioned compartments.
3. A carton according to claim 1 wherein the second handle panel comprises a first edge defined by the second hinged connection and a second edge opposing the first edge and wherein a portion of the first edge of the second handle panel is engageable with at least one article in a first row of articles so as to secure the carrying handle in the stowed position when the carton is loaded with articles.
4. A carton according to claim 3 wherein a portion of the second edge of the second handle panel is engageable with at least one further article in a second row of articles so as to secure the carrying handle in the stowed position when the carton is loaded with articles.
5. A carton according to claim 1 wherein the second handle panel comprises a first edge defined by the second hinged connection and a second edge opposing the first edge, the second edge being part of an outer periphery of the second handle panel, and wherein a portion of the second edge of the second handle panel is engageable with at least one article in a row of articles so as to secure the carrying handle in the stowed position when the carton is loaded with articles.
6. A carton according to claim 1 wherein the one of the plurality of walls is a top wall which comprises first and second top panels, wherein the first handle panel is hingedly connected to the first top panel by the first hinged connection, and wherein the carrying handle further comprises:
 - a third handle panel hingedly connected to the second handle panel by a third hinged connection; and
 - a fourth handle panel hingedly connected to the third handle panel by a fourth hinged connection, the fourth handle panel hingedly connected to the second top panel by a fifth hinged connection,
 - wherein the third handle panel is folded about the third hinged connection so as to be arranged in a face-to-face relationship with the second handle panel and the fourth handle panel is arranged in a face-to-face relationship with the first handle panel.
7. A carton according to claim 6 wherein the second edge of the second handle panel is defined by the third hinged connection.
8. A carton according to claim 6 wherein the carrying handle further comprises at least one relief structure, the at least one relief structure comprising a cutaway struck at least in part from the third handle panel, the cutaway being disposed proximate the third hinged connection, and wherein a portion of the second handle panel proximate the cutaway is engageable with the at least one further article in a second row of articles.
9. A carton according to claim 6 wherein the relief structure comprises a severance line defined in the second handle panel.
10. A package comprising:
 - a plurality of articles arranged in at least two rows,
 - a carton comprising:
 - a plurality of outer walls; and
 - a carrying handle, the carrying handle comprising:
 - a first handle panel hingedly connected to one of the plurality of outer walls by a first hinged connection;
 - a second handle panel hingedly connected to the first handle panel by a second hinged connection; and
 - a handle opening formed in at least one of the first and second handle panels,
 - wherein the carrying handle is foldable about the first and second hinged connections so as to be arranged in a stowed position above the one of the plurality of outer walls and between the at least two rows of articles.
11. A package according to claim 10 wherein the carrying handle comprises a deployed position in which at least a portion of the carrying handle is disposed at an elevation above the upper ends of the plurality of articles.
12. A package according to claim 11 wherein in the deployed position, an upper edge of the handle opening is disposed at an elevation above the upper ends of the plurality of articles.
13. A blank for forming a carton, the blank comprising:
 - a plurality of panels for forming outer walls of the carton; and
 - a plurality of panels for forming a carrying handle, the plurality of panels for forming the carrying handle comprising:

a first handle panel hingedly connected to one of the plurality of panels for forming the outer walls by a first hinged connection;
 a second handle panel hingedly connected to the first handle panel by a second hinged connection;
 a handle opening formed in at least one of the first and second handle panels,

edge of the second handle panel.

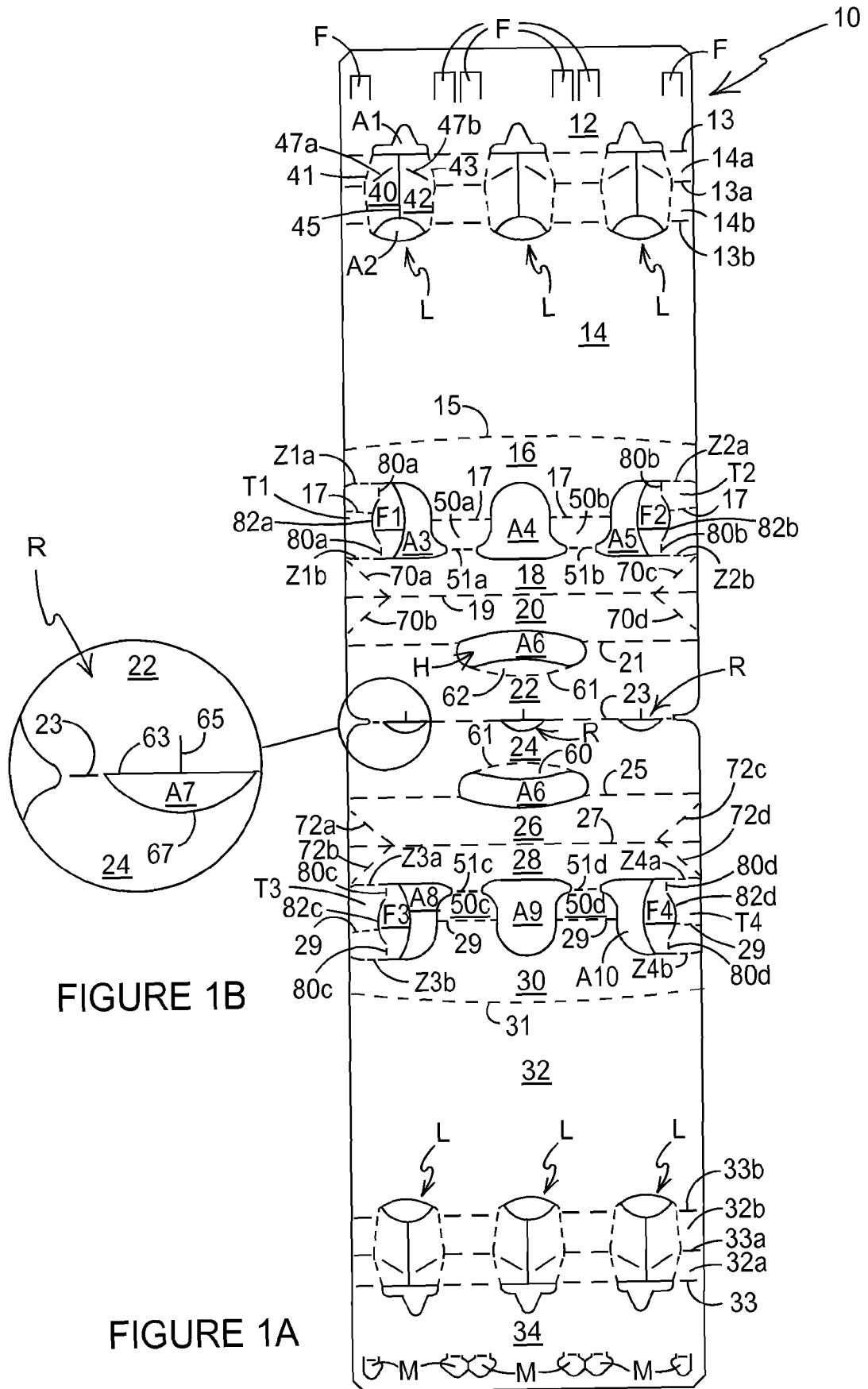
wherein in set up carton, the carrying handle is foldable about the first and second hinged connections so as to be arranged in a stowed position over the one of the plurality of panels for forming the outer walls.

14. A blank according to claim 13 wherein the one of the plurality of panels for forming the outer walls comprises a first top panel, wherein the plurality of panels for forming the outer walls further includes a second top panel, and wherein the plurality of panels for forming the carrying handle further comprises:

a third handle panel hingedly connected to the second handle panel by a third hinged connection; and
 a fourth handle panel hingedly connected to the third handle panel by a fourth hinged connection, the fourth handle panel being hingedly connected to the second top panel by a fifth hinged connection,
 wherein the third handle panel is folded about the third hinged connection so as to be arranged in a face-to-face relationship with the second handle panel and the fourth handle panel is arranged in a face-to-face relationship with the first handle panel.

15. A blank according to claim 14 wherein the plurality of panels for forming the carrying handle further comprise at least one relief structure, the at least one relief structure comprising a cutaway struck at least in part from the third handle panel, the cutaway being disposed proximate the third hinged connection, and wherein a portion of the second handle panel proximate the cutaway is engageable with at least one article to be received in a carton formed from the blank.

16. A blank according to claim 15 wherein the at least one relief structure comprises a severance line defined in the second handle panel, and wherein the second handle panel has first and second opposed edges, the first edge of the second handle panel being defined by the second hinged connection, the second edge of the second handle panel being defined by the third hinged connection, and wherein the severance line extends in the second handle panel substantially perpendicularly from the second



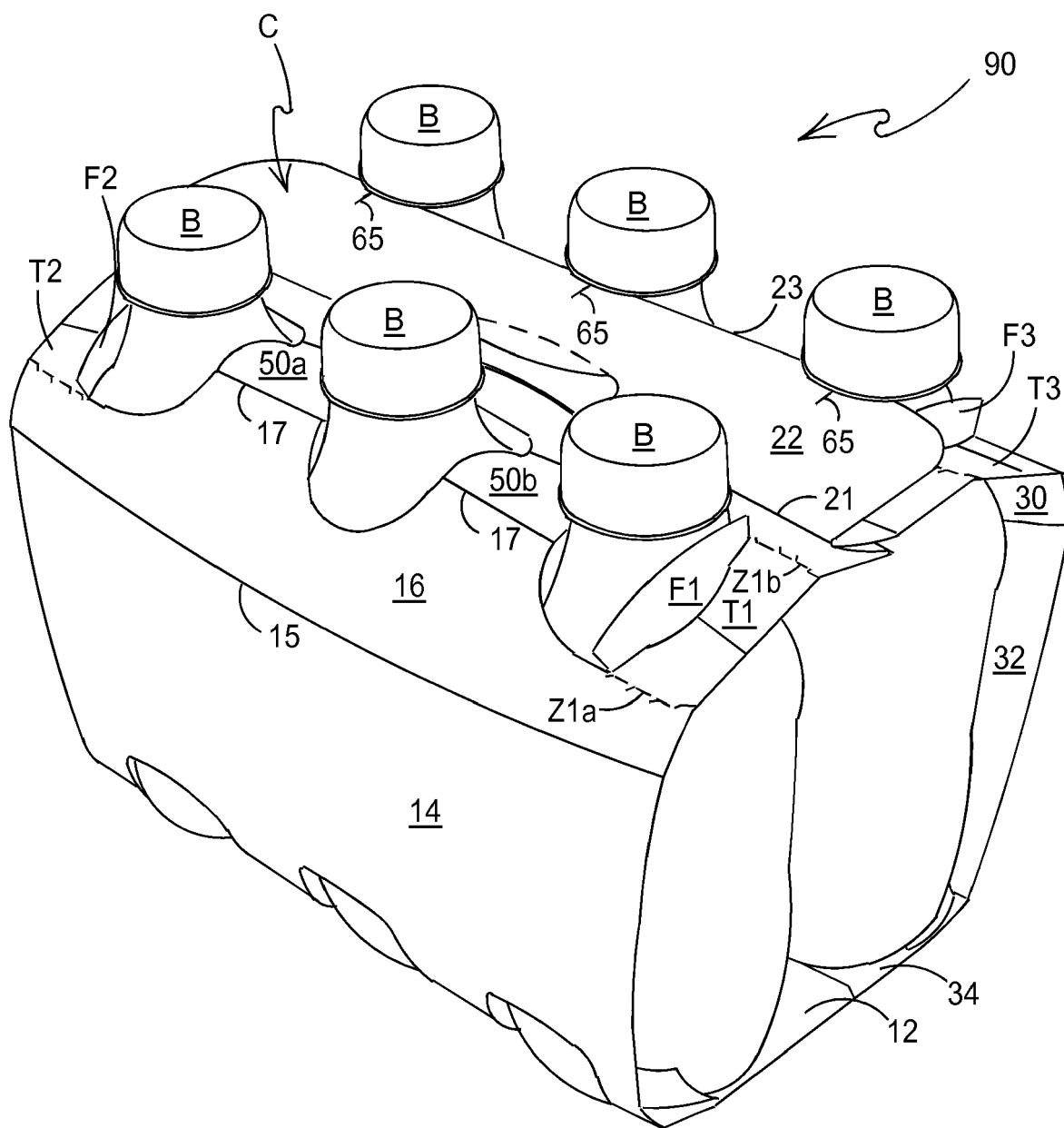


FIGURE 2

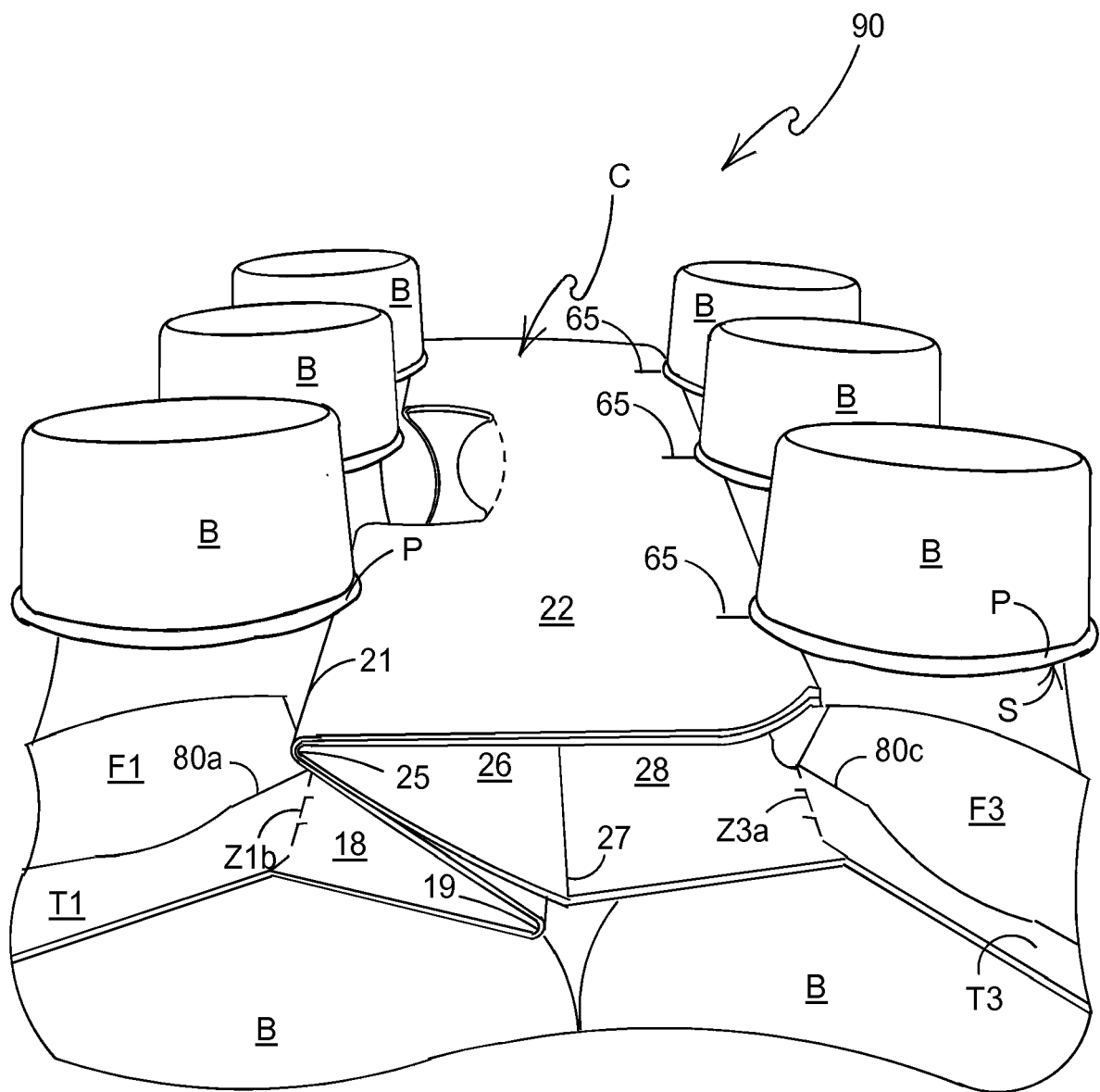


FIGURE 3

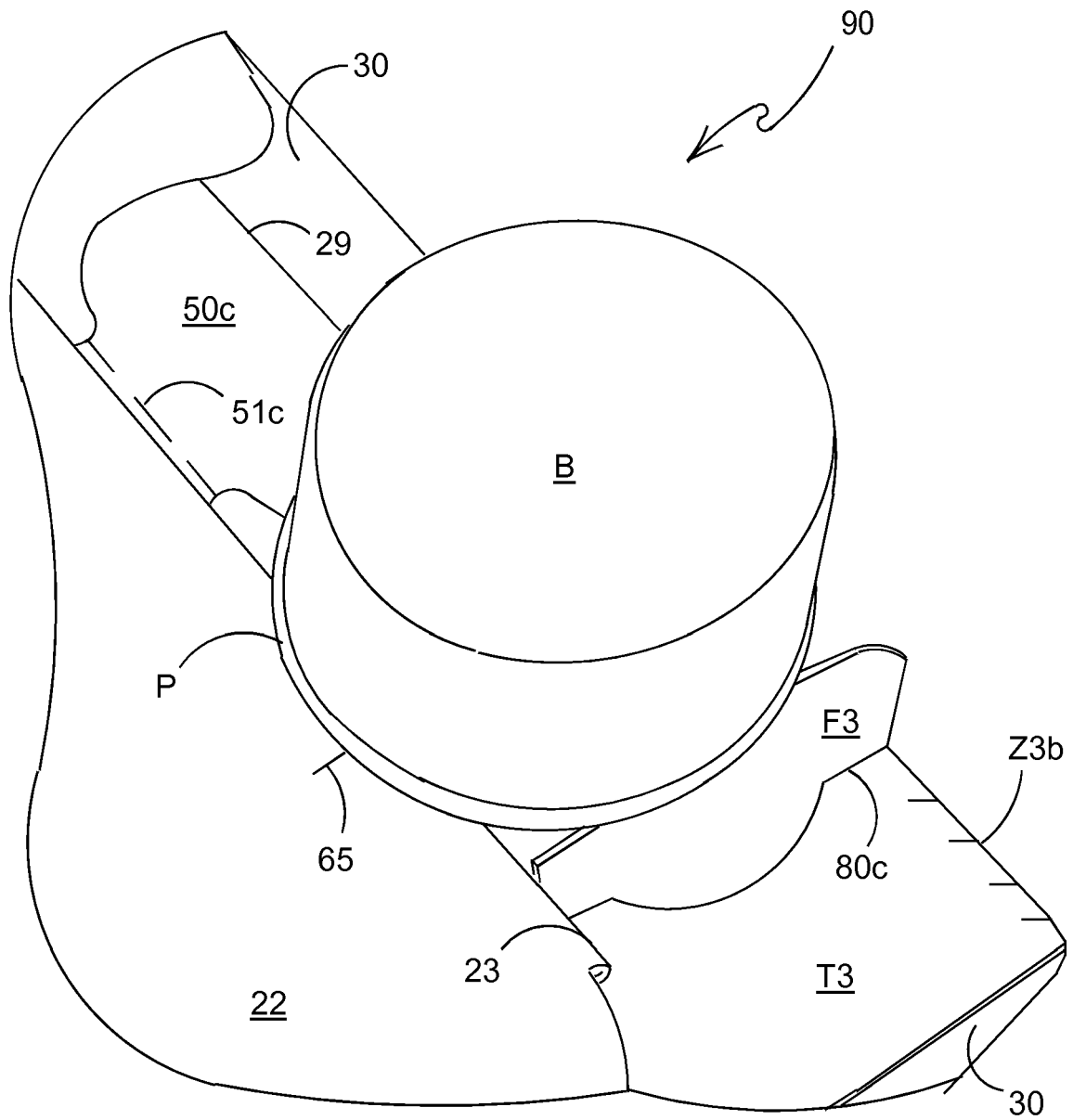


FIGURE 4

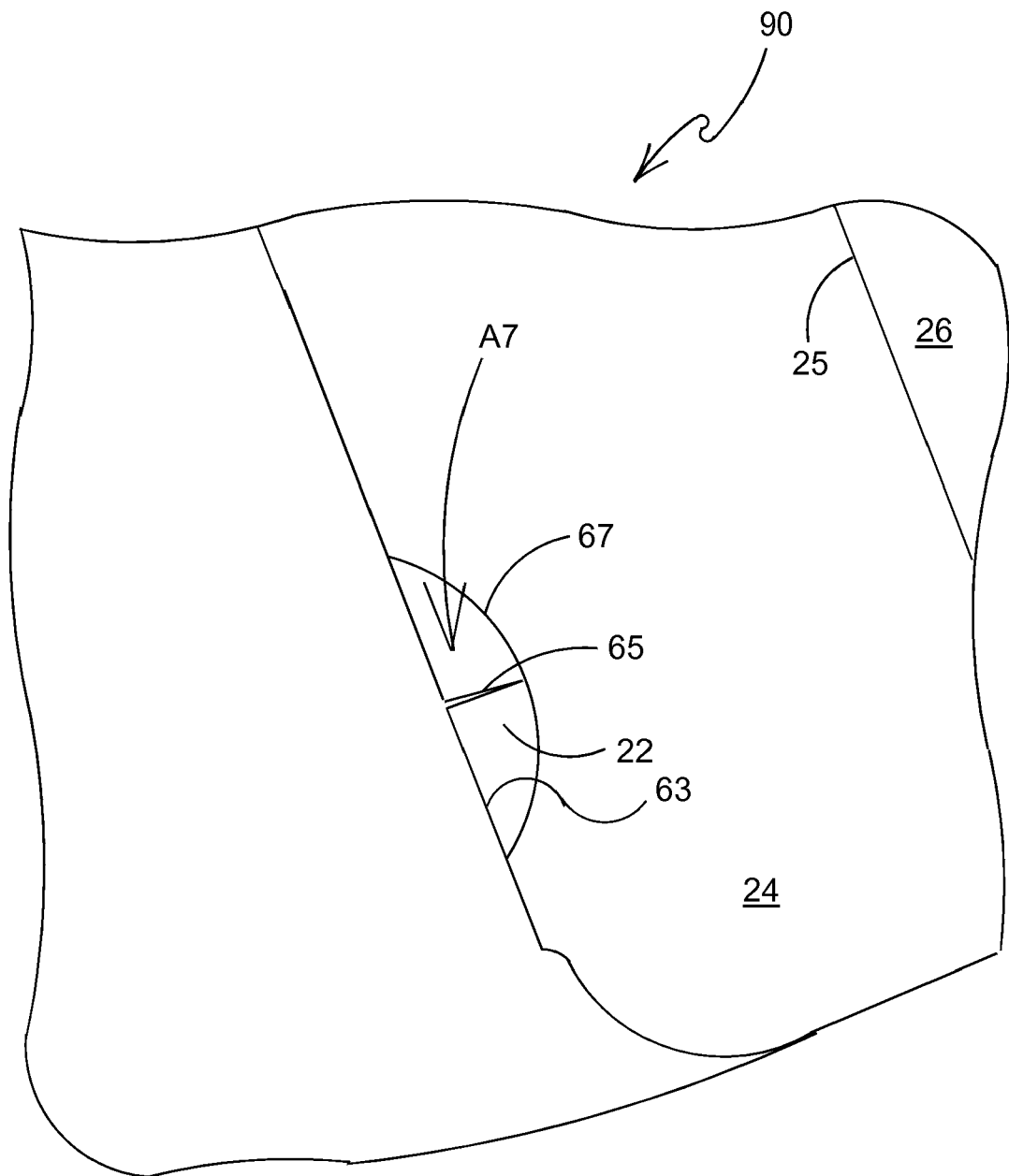


FIGURE 5

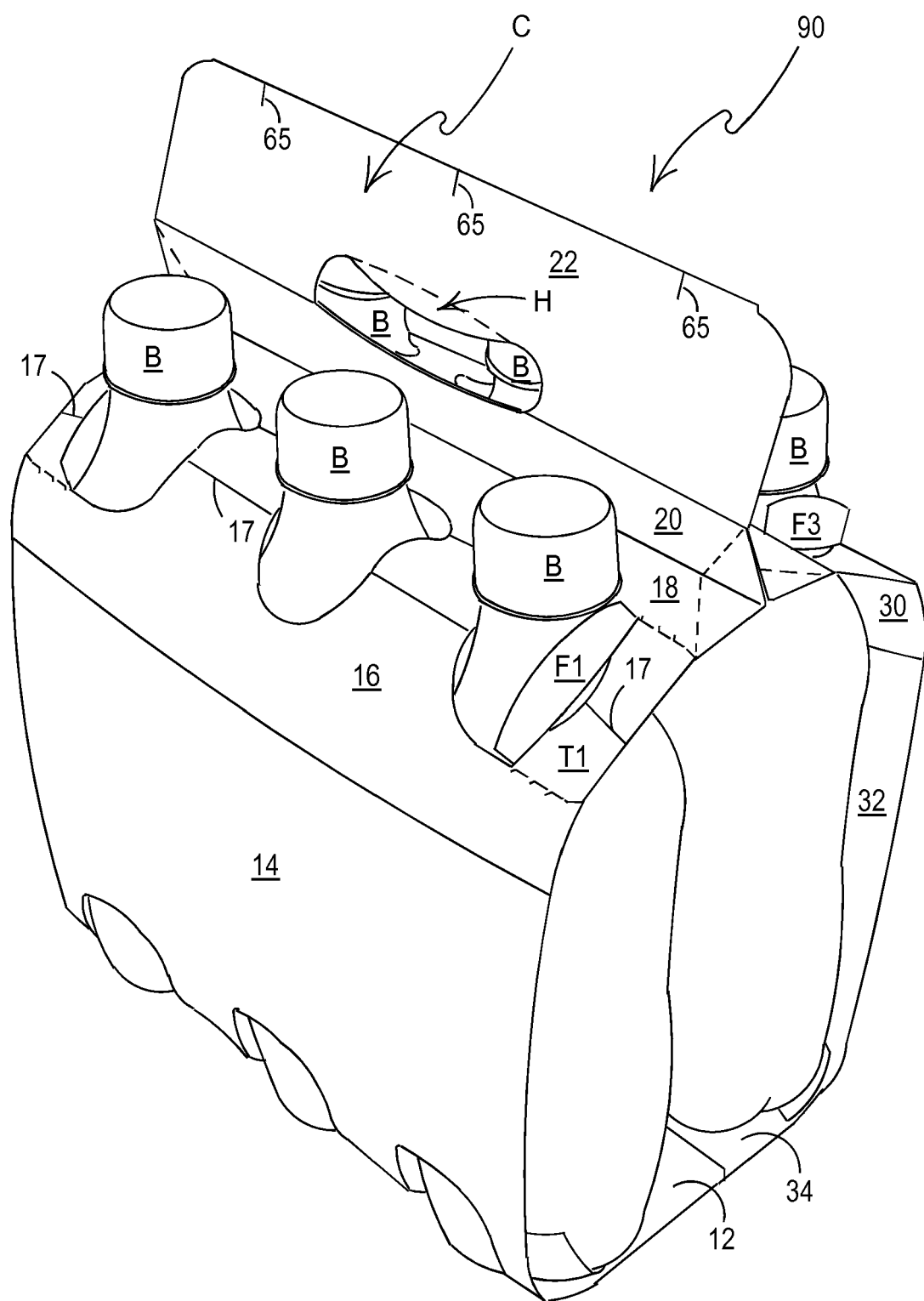


FIGURE 6

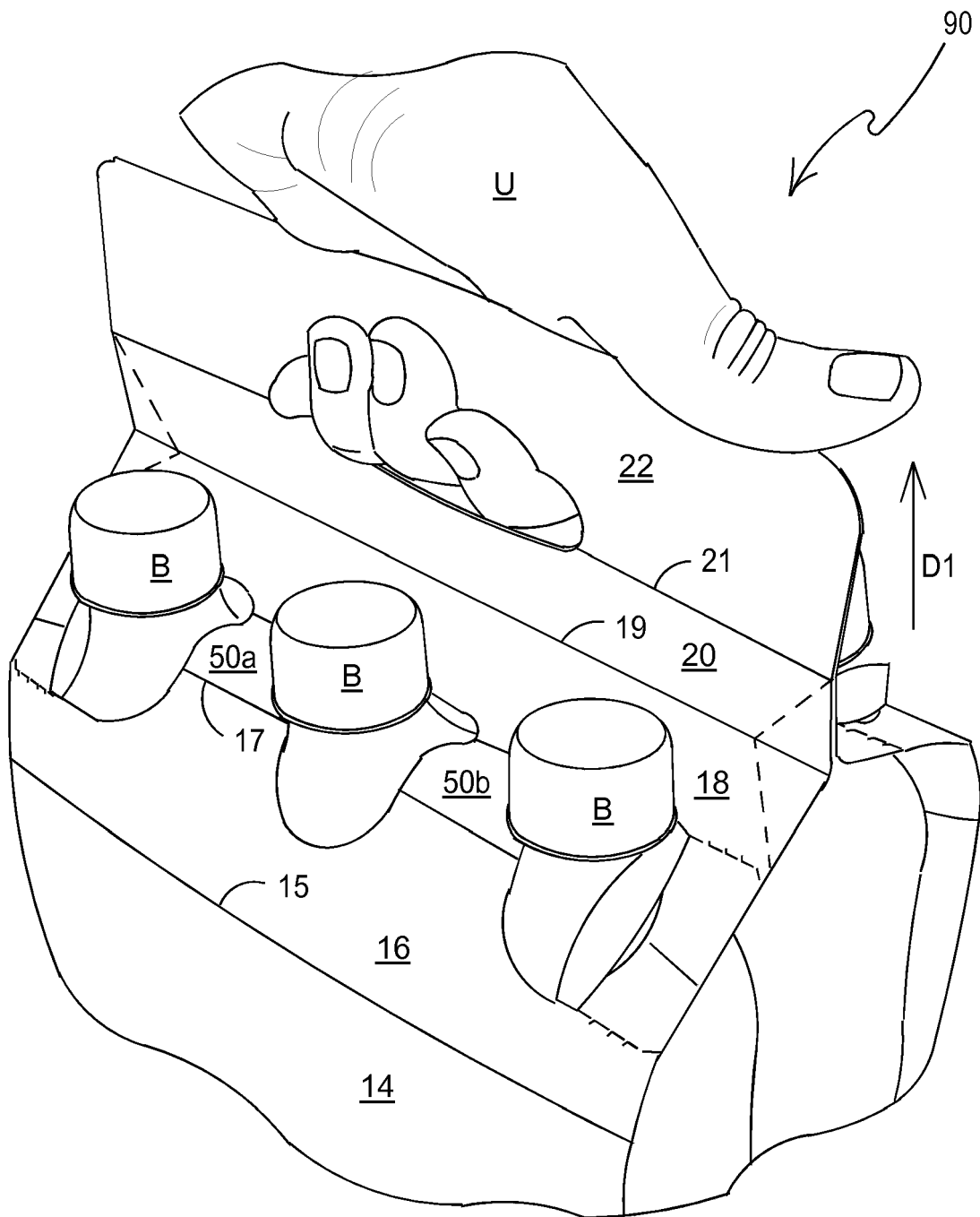


FIGURE 7



EUROPEAN SEARCH REPORT

 Application Number
 EP 17 16 1924

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2010/019809 A1 (MEADWESTVACO PACKAGING SYSTEMS [US]; HETTINGER PETER [DE]; MENZEL ANDR) 18 February 2010 (2010-02-18)	1,3-7, 10-14	INV. B65D71/30
Y	* page 9, line 23 - line 27; figures 1, 6, 7 *	2	
Y	----- US 4 146 168 A (HARTLINE HERBERT A) 27 March 1979 (1979-03-27) * figures 2, 3 * -----	2	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 June 2017	Examiner Bridault, Alain
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 EPO FORM 1503 03/02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 17 16 1924

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2010019809 A1	18-02-2010	CA 2733295 A1	18-02-2010
		EP 2310291 A1	20-04-2011
		US 2011204128 A1	25-08-2011
		WO 2010019809 A1	18-02-2010

US 4146168 A	27-03-1979	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82