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(54) **PACKAGING SYSTEM AND BLANKS THEREFOR**

(57) A package (94) comprising at least one first inner carrier (92) and a second outer carrier (90), the or each of the at least one first inner carrier (92) having a first tubular axis, the second outer carrier (90) having a second tubular axis, and the second outer carrier being disposed, at least in part, on the outside of the first inner carrier such that the first and second tubular axes are substantially perpendicular.

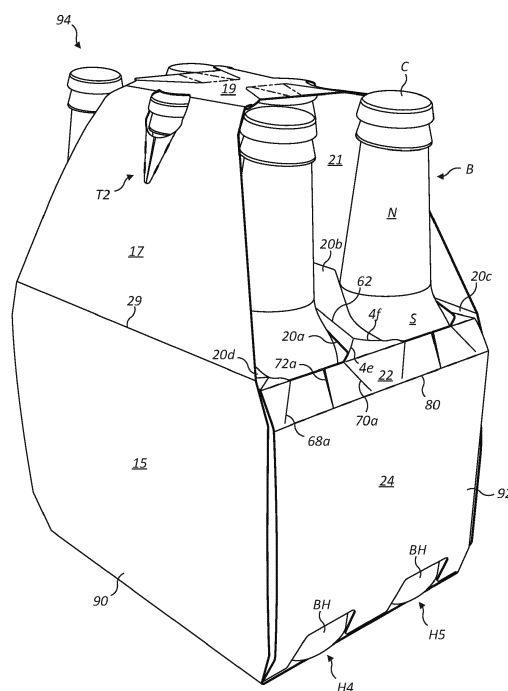


FIG. 3

Description

FIELD OF THE INVENTION

[0001] The present invention relates to consumer packages comprising at least two wraparound style carriers and more particularly, but not exclusively, to a package comprising at least two substantially perpendicularly oriented wraparound style carriers such that the completed package comprises four end walls.

BACKGROUND OF THE INVENTION

[0002] In the field of packaging it is often required to provide consumers with a package comprising multiple primary product containers. Such multi-packs are desirable for shipping and distribution and for display of promotional information. Wraparound style carriers are known in which a blank is wrapped around a group of articles to secure the group together for ease of transportation, shelf replenishment and sale. Such blanks may be wrapped over the top of the group of articles, or such blanks may comprise apertures through which the necks of articles pass as the blank is wrapped around the group. Two side panels extend alongside two sides of the group of articles and a composite bottom wall is typically formed by locking two bottom panels together, in a tensioned manner, such that the wrapped blank tightly holds the articles in their group.

[0003] Wraparound carriers are typically formed with only two sides and this results in a reduction in costs of the carrier because of the reduced amount of material required. A disadvantage of this, however, is that two ends of the group of articles are exposed, are less protected, and less "bill-board" area is available for the printing and display of branding, advertising and other sales driving indicia.

[0004] A further advantage of wraparound carriers is that assembly of the carriers can be automated at high speed, because there is no requirement for significant manipulation of the blank or of the group of articles. Disadvantageously however, the simple wraparound structure relies upon the tight fit of the blank about the article group in order to retain structural integrity. This means that as soon as a consumer removes an article from the group, the "tight fit" and hence the structural integrity of the package is compromised. As a consequence the useful life of the wraparound carrier is typically limited to the point at which an article is removed, at which time the remaining articles of the group become more difficult to handle.

[0005] For cost and environmental considerations, it is still preferable if such carrier and packages are formed from as little material as possible and cause as little waste in the materials from which they are formed as possible. Another consideration is the strength of the packaging and its suitability for holding and transporting large weights of articles. A further consideration is the contri-

bution the carrier makes to the appearance and overall value of the packaged goods, particularly in relation to its brand enhancement capability and its ability to stand out on a store shelf and attract consumers to purchase the grouped articles.

[0006] The present invention seeks to provide an improvement in the field of packaging, more specifically wraparound packaging, by providing a package comprising at least two wraparound carriers, which wraparound carriers are oriented substantially perpendicularly to one another such that the completed package comprises four side walls. The at least two wraparound carriers may comprise co-operative features; for example, the carriers may be lockable to one another.

SUMMARY OF INVENTION

[0007] According to a first aspect of the present invention there is provided a package comprising at least one first inner carrier and a second outer carrier, the or each of the at least one first inner carrier having a first tubular axis, the second outer carrier having a second tubular axis, and the second outer carrier being disposed, at least in part, on the outside of the first inner carrier such that the first and second tubular axes are substantially perpendicular.

[0008] Optionally, the package further comprises a group of articles, wherein the or each at least one first inner carrier is of the wraparound type and comprises: a top panel, first and second side panels, a bottom wall and two opposite open ends, wherein the first tubular axis extends between the two opposite open ends; wherein the second outer carrier is of the wraparound type and comprises: a top panel, first and second side panels, a bottom wall and two opposite open ends, wherein the second tubular axis extends between the two opposite open ends; wherein the first inner carrier is wrapped about the group of articles, and wherein the second outer carrier is wrapped around the first inner carrier and group of articles.

[0009] Optionally, the first and second carriers comprise complementary features provided to facilitate co-operation of the first and second carriers.

[0010] Optionally, the second outer carrier comprises at least one locking tab and wherein the first inner carrier comprises an aperture, the first and second carriers being configured such that when the package is formed, the locking tab of the second outer carrier is received in said aperture of the first inner carrier for connecting the first inner and second outer carriers together.

[0011] Optionally, the bottom wall of the first inner carrier is formed by a first bottom panel and a second bottom panel disposed in at least partial overlapping relationship, and wherein the aperture is defined in part by a first cut-away struck from the first bottom panel and a second cutaway struck from the second bottom panel.

[0012] Optionally, the second outer carrier comprises an article engaging structure, and wherein a top of at

least one of the articles of the group in the first inner carrier is received, at least in part, within the engaging structure of the second outer tubular structure.

[0013] Optionally, the package further comprises a carrying handle structure, which carrying handle structure comprises one or more foldable tabs, and wherein said one or more foldable tabs provide a spacer for being disposed between two adjacent articles.

[0014] According to another aspect of the disclosure, there is provided a package comprising a first carton and two or more articles, the first carton comprising: a top panel, first and second side panels, a bottom wall, wherein the first carton is disposed about the group of articles, and wherein the carton is disposed about the two or more articles, wherein at least one of the first and second side panels comprises a fold line extending at least in part between the top panel and the bottom wall, the fold line arranged to be aligned with a void between a pair of adjacent articles and facilitating folding of said one of the first and second side panels into said void.

[0015] Optionally, the other one of the first and second side panels comprises a second fold line extending at least in part between the top panel and the bottom wall, the second fold line arranged to be aligned with a second void between a pair of adjacent articles and facilitates folding of said other one of the first and second side panels into said second void.

[0016] Optionally, the package comprises a second carton, the first carton having a first tubular axis, the second carton having a second tubular axis, and the second carton being disposed, at least in part, on the outside of the first carton such that the first and second tubular axes are substantially perpendicular.

[0017] Optionally, the package comprises a group of articles arranged in two or more rows, each row comprising at least two articles and wherein the second carton comprises: a top panel, first and second side panels, a bottom wall, wherein the at least one of the first and second side panels of the second carton comprises a third fold line extending at least in part between the top panel and the bottom wall, the fold line arranged to be aligned with a third void between an article in a first row and a further article in an adjacent row, the third fold line facilitating folding of said one of the first and second side panels of the second carton into said third void.

[0018] Optionally, the other one of the first and second side panels of the second carton comprises a fourth fold line extending at least in part between the top panel and the bottom wall, the fourth fold line arranged to be aligned with a fourth void between a pair of articles disposed in adjacent rows and facilitates folding of said other one of the first and second side panels of the second carton into said fourth void.

[0019] Optionally, the articles are substantially cylindrical in shape, said void being defined at least in part by a recess between a portion of the cylindrical wall of each of a pair of adjacent articles, and wherein the fold line forms a valley fold, extending substantially vertically,

the valley fold being received in the void so as to tighten the first carton about the two or more articles.

[0020] Optionally, the package comprises at least two inner carriers and an outer carrier, each of the at least two inner carriers having a first tubular axis, and the second outer carrier being disposed, at least in part, on the outside of each of the at least two inner carriers such that the first tubular axes of each of the inner carriers are disposed substantially perpendicular to the second tubular axis of the second carrier.

[0021] Optionally, the package comprises a group of articles arranged in two or more rows, each row comprising at least two articles and wherein the package the second outer carrier is asymmetric, the second outer carrier being configured such that diagonally opposite articles in the group are exposed to view.

[0022] Optionally, at least a portion of the diagonally opposite articles are visible through a respective open end of the first inner carrier.

[0023] Optionally, the second outer carrier comprises: a top panel, first and second side panels, a bottom wall, and wherein the second outer carrier comprises a partition panel hinged to at least one of the first and second side panels the partition panel being folded into a void between two adjacent articles, whereby exposing to view one of said two adjacent articles.

[0024] Optionally, the hinge partition panel is hinged to an end edge of the at least one of the first and second partition panels.

[0025] Optionally, the bottom wall of the first inner carrier is formed by a first bottom panel and a second bottom panel disposed in at least partial overlapping relationship, and wherein a second aperture is defined in the first bottom panel and a third aperture is defined in the second bottom panel, the second and third apertures being disposed in vertical registry with one another.

[0026] Optionally, the first bottom panel comprises at least one securing tab defining in part said second aperture and wherein the at least one securing tab is received in the third aperture whereby securing the first and second panel together.

[0027] Optionally, the at least one locking tab provided by the second outer carrier is received in the second and third apertures provided by the first inner carrier.

[0028] Optionally, the or each at least one first inner carrier comprises a first tubular structure formed from a first top panel, first and second side panels, a first composite bottom wall formed from a first bottom panel disposed in at least partial overlapping relationship with a second bottom panel, and wherein the or each at least one second outer carrier comprises a first tubular structure formed from a second top panel, third and fourth side panels, a second composite bottom wall formed from a third bottom panel disposed in at least partial overlapping relationship with a fourth bottom panel, wherein one of the first and second bottom panels comprises a first alignment aperture for facilitating assembly of the first inner carrier about a group of articles, wherein one of the

third and fourth bottom panels comprises an alignment aperture for facilitating assembly of the second outer carrier, the first alignment aperture configured to allow movement of a machine component in two directions during assembly of the package.

[0029] Optionally, the first alignment aperture is shaped to allow movement of a machine component in two substantially perpendicular directions during assembly of the package.

[0030] Optionally, the first alignment aperture is shaped such that a machine component is moveable in a first direction substantially perpendicular to the tubular axis of the first inner carrier so as to facilitate assembly of the first inner carrier and in a second direction substantially parallel with the tubular axis of the first inner carrier so as to facilitate assembly of the second outer carrier.

[0031] Optionally, the first alignment aperture is shaped to facilitate alignment of the third and fourth panels of the second outer carrier with respect to each other and to facilitate alignment of the third and fourth panels of the second outer carrier with respect to the first bottom panel of the first inner carrier.

[0032] According to another aspect of the disclosure, there is provided a two part package comprising at least one first inner carrier and a second outer carrier, the first inner carrier comprising:

a first tubular axis;

a top panel having at least one slot therein for receiving a portion of at least one article; the second outer carrier comprising:

a second tubular axis;

wherein the second outer carrier is disposed, at least in part, about the at least one first inner carrier, the first and second tubular axes being arranged substantially perpendicular.

[0033] Optionally, the package further comprises a group of articles, wherein the at least one first inner carrier is of the wraparound type and comprises: a top panel, first and second side panels, a bottom wall and two opposite open ends, wherein the first tubular axis extends between the two opposite open ends and defines a longitudinal direction; wherein the second outer carrier is of the wraparound type and comprises: a top panel, first and second side panels, a bottom wall and two opposite open ends, wherein the second tubular axis extends between the two opposite open ends; wherein the at least one first inner carrier is wrapped about the group of articles, and wherein the second outer carrier is wrapped around the at least one first inner carrier and group of articles.

[0034] Optionally, the bottom wall of the at least one first inner carrier is disposed in overlying relationship with the bottom wall of the second outer carrier.

[0035] Optionally, the top panel comprises a first slot

for receiving a portion of at least one article in a first row of articles, and a second slot for receiving a portion of at least one article in a second row of articles, the top panel comprising a spacer keel disposed between the first and second rows of articles.

[0036] Optionally, the spacer keel comprises a first portion defining in part the first slot and a second portion defining in part the second slot, the first and second portion being arranged to form a valley trough or "V" shape.

[0037] Optionally, the spacer keel comprises a first portion defining in part the first slot and a second portion defining in part the second slot, the first and second portion being arranged to form an inverted "V" Shape.

[0038] Optionally, the top panel comprises a first slot for receiving a portion of at least one article in a first row of articles, and a second slot for receiving a portion of at least one article in a second row of articles, the first and second slots extending transversely to the longitudinal direction, the top panel comprising a spacer keel disposed between the first and second rows of articles.

[0039] Optionally, the spacer keel comprises a first portion defining in part the first slot and a second portion defining in part the second slot, the first and second portion being arranged to form a valley trough or "V" shape, the first portion being hinged to the second portion by a hinged connection.

[0040] Advantageously, the package may be packaged in a packaging machine comprising a static guide extending along the hinged connection, so as to fold the spacer keel when the blank is loaded bottles.

[0041] Optionally, the top panel comprises a first slot for receiving a portion of at least one article in a first row of articles, and a second slot for receiving a portion of at least one article in a second row of articles, the first and second slots extending longitudinally in the top panel.

[0042] Optionally, the at least one first inner carrier comprises a first and second side wall panels each of the first and second side wall panels comprising an oblique fold lines in each of the upper corners thereof, whereby facilitating folding of the first and second side wall panels about a shoulder portions of an adjacently disposed article.

[0043] Optionally, the outer shell is formed from a material selected from the group consisting of: paperboard, cardboard, coated board, plastics material and polymeric substrates.

[0044] Within the scope of this application it is envisaged that the various aspects, embodiments, examples, features and alternatives set out in the preceding paragraphs, in the claims and/or in the following 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

[0045] Exemplary embodiments of the invention will

now be described with reference to the accompanying drawings, in which:

Figure 1 is a plan view from above of a first inner wraparound blank according to a first embodiment of the invention for use with a second outer wraparound blank, such as but not limited to, the blank of Figure 2;

Figure 2 is a plan view from above of a second outer wraparound blank according to a first embodiment of the invention for use with the first inner wraparound blank of Figure 1;

Figure 3 is a perspective view from above of a package comprising a group of articles wrapped within a composite carrier formed from the first blank of Figure 1 and the second blank of Figure 2;

Figure 4 is an enlarged view of part of the package of Figure 3;

Figure 5 is a perspective view from above of the package of Figure 3, wherein two articles have been removed from the package and yet the structural integrity of the composite carrier formed from the first and second wraparound blanks is not significantly compromised;

Figure 6 is a plan view from above of a first inner wraparound blank according to a second embodiment of the invention for use with a second outer wraparound blank, such as but not limited to, the blank of Figure 2;

Figure 7 is a perspective view from above of the wraparound blank of Figure 6 in an assembled form as a wraparound carrier holding a group of six articles;

Figure 8 is a perspective view from above of a package comprising a group of articles wrapped within a composite carrier formed from the first blank of Figure 6 and the second blank of Figure 2;

Figure 9 is a plan view from above of a first inner wraparound blank according to a third embodiment of the invention for use with a second outer wraparound blank, such as but not limited to, the blank of Figure 2;

Figure 10 is a perspective view from above of a package comprising a group of articles wrapped within a composite carrier formed from the first blank of Figure 9 and the second blank of Figure 2;

Figure 11 is a perspective view from above of the package of Figure 10, wherein two articles have been removed from the package and yet the structural integrity of the composite carrier, formed from the first inner and second outer wraparound blanks of Figures 9 and 2, is not significantly compromised;

Figure 12 is an enlarged view of part of the package of Figure 11;

Figure 13 is a plan view from above of a second outer wraparound blank according to a fourth embodiment of the invention for use with the first inner wraparound blank of Figure 14;

Figure 14 is a plan view from above of a first inner wraparound blank according to a fourth embodiment of the invention for use with a second outer wraparound blank, such as but not limited to, the blank of Figure 13;

Figure 15 is a perspective view from above of a package comprising a group of articles wrapped within a composite carrier formed from the first blank of Figure 14 and the second blank of Figure 13;

Figure 16 is an internal view of part of a bottom structure of the package of Figure 15 wherein part of a composite bottom wall of a first inner wraparound carrier formed from the first inner blank of Figure 14 is shown locked to a composite bottom wall of a second outer wraparound carrier formed from the second outer blank of Figure 13.

Figure 17 is a plan view from above of a second outer wraparound blank according to a fifth embodiment of the invention for use with the first inner wraparound blank of Figure 18;

Figure 18 is a plan view from above of a first inner wraparound blank according to a fifth embodiment of the invention for use with a second outer wraparound blank, such as but not limited to, the blank of Figure 17;

Figure 19 is a perspective view from above of a package comprising a group of articles wrapped within a composite carrier formed from the first blank of Figure 18 and the second blank of Figure 17;

Figure 20 is a plan view from above of a first inner wraparound blank according to a sixth embodiment of the invention for use with a second outer wraparound blank, such as but not limited to, the blank of Figure 21;

Figure 21 is a plan view from above of a second outer wraparound blank according to a sixth embodiment of the invention for use with the first inner wraparound blank of Figure 20;

Figure 22 is a perspective view from above of a package comprising a group of articles wrapped within a composite carrier formed from the first blank of Figure 20 and the second blank of Figure 21;

Figure 23 is an enlarged view of part of the package of Figure 22;

Figure 24 is a plan view from above of a first inner wraparound blank according to a seventh embodiment of the invention for use with a second outer wraparound blank, such as but not limited to, the blank of Figure 25;

Figure 25 is a plan view from above of a second outer wraparound blank according to a seventh embodiment of the invention for use with two carriers formed from two first inner wraparound blanks of Figure 24;

Figure 26 is a perspective view from above of a package comprising a group of articles wrapped within a composite carrier formed from the first blank of Figure 24 and the second blank of Figure 25;

Figure 27 is an enlarged view of part of the package

of Figure 26;

Figure 28 is a plan view from above of a first inner wraparound blank according to an eighth embodiment of the invention for use with a second outer wraparound blank of various embodiments of the invention; and

Figure 29 is a perspective view from above of the wraparound blank of Figure 28 in an assembled form as a wraparound carrier holding a group of six articles.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS OF THE PRESENT INVENTION

[0046] 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.

[0047] 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, enclosing, housing, carrying, and/or dispensing 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. Examples of product containers that may be used include bottles (for example metallic, glass or plastics bottles), cans (for example aluminium cans), tins, pouches, packets and the like.

[0048] The carriers and packages shown herein are 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.

[0049] In various embodiments, blanks are shown which are configured to form a carton or carrier for packaging an optional arrangement of suggested articles. In a first illustrated embodiment, the arrangement is a 3 x 2 matrix and the articles are bottles. The blanks can be

alternatively configured to form a carrier for packaging other types, number and size of article and/or for packaging articles in a different arrangement or configuration.

[0050] Referring now to Figure 1, there is shown a plan view from above of a first inner blank 10 according to a first embodiment of the disclosure. The first inner blank 10 is optionally a wraparound style blank 10. The first inner blank 10 is suitable for being paired with a second outer blank, such as but not limited to, the second outer blank 11 shown in Figure 2.

[0051] The first inner blank 10 comprises a series of main panels which form the main walls of a first inner carrier 92 once the first inner blank 10 is assembled. The series of main panels include: a first bottom panel 12, a first bevel panel 14, a first side panel 16, a second bevel panel 18, a top panel 20, a third bevel panel 22, a second side panel 24, a fourth bevel panel 26 and a second bottom panel 28. The main panels 12, 14, 16, 18, 20, 22, 24, 26, 28 are hinged one to the next in series along fold lines 30, 32, 34, 36, 38, 80, 82 and 84.

[0052] Additionally, first and second end panels 50, 52 are coupled to the top panel 20 by fold lines 60, 64 respectively. To automatically articulate the first and second end panels 50, 52 into position when the blank 10 is assembled, four gusset panels 54a, 54b, 54c, 54d and four web panels 56a, 56b, 56c, 56d are hinged between the first and second end panels 50, 52 and the first and second side panels 16, 24 respectively. As can be seen, each gusset panel 54a, 54b, 54c, 54d is hinged by a fold line 64a, 64b, 64c, 64d to the first or second side panel 16, 24; and each gusset panel 54a, 54b, 54c, 54d is hinged by a fold line 58a, 58b, 58c, 58d to an adjacent web panel 56a, 56b, 56c, 56d. Each web panel 56a, 56b, 56c, 56d is, in turn, hinged to an adjacent first or second end panel 50, 52 along a fold line 57a, 57b, 57c, 57d. As described further below, as the first and second side panels 16, 24 are folded relative to the top panel 20, the four gusset panels 54a, 54b, 54c, 54d and four web panels 56a, 56b, 56c, 56d are folded and moved and cause the first and second end panels 50, 52 to also fold relative to the top panel 20.

[0053] To facilitate the mechanical interlocking of the first and second bottom panels 12, 28, the first and second bottom panels 12, 28 are provided with complementary locking means. Optionally, the illustrated complementary locking arrangement comprises two female tabs F1, F2 in the first bottom panel 12; and two male locking tabs M1, M2 in the second bottom panel 28.

[0054] Optional alignment apertures A1, A3 are provided in the second bottom panel 28. The alignment apertures A1, A3 facilitate the automated location of the second bottom panel 28 relative to the first bottom panel 12.

[0055] Optional article heel engaging features H1, H2, H3, H4 are provided for engaging and securely locating the heel of an article. Each heel engaging feature H1, H2, H3, H4 is formed in part in a bevel panel 14, 26, in part in a bottom panel 12, 28 and in part in a side panel

16, 24. The presence of the heel engaging features H1, H2, H3, H4 is entirely optional; and when provided, the configuration of the heel engaging features H1, H2, H3, H4 may take many and various forms. As such, the configuration of each heel engaging feature H1, H2, H3, H4 illustrated in Figure 1 is merely an example and is in no way limiting. Optionally, each of the four heel engaging features H1, H2, H3, H4 shown has the same configuration and therefore only one will be described.

[0056] Heel engaging feature H1 comprises a bottom aperture 40, a pair of inwardly foldable retention tabs 46a, 44a, and an upper aperture 42. The pair of inwardly foldable retention tabs 46a, 44a is each foldably connected to the first bottom panel 12, first bevel panel 14 and first side panel 16 by means of arcuate fold lines 46, 44. Optionally each inwardly foldable retention tab 46a, 44a may comprise a score or cut therethrough to facilitate its inward bending when displaced during assembly of the blank 10 about an article group.

[0057] The second and third bevel panels 18, 22 optionally comprise a weakened arrangement 68a, 72a, 70a adjacent to each endmost aperture 2a, 2b, 2c, 2d. Since the weakened arrangements 68a, 72a, 70a are optionally similar, only one is described. Aperture 2c is defined in part by a cut line that is co-linear with fold line 38 and which terminates at short, arcuate fold lines 4c and 4e respectively (see Figure 1). Adjacent to the aperture 2c a slit 72a extends from an edge of the aperture 2c down to fold line 80. A first weakened line 68a extends at an angle away from the junction of the cut line and the short, arcuate fold line 4c, towards but not reaching the fold line 80. A second weakened line 70a extends at an angle away from the junction of the cut line and the short, arcuate fold line 4e, towards but not reaching the fold line 80. The weakened arrangement 68a, 72a, 70a defines a tab 66a which can be displaced out of the plane of the third bevel panel 22 (see Figure 4) once the first inner carrier 92 is assembled. The four weakened arrangements may assist in removal of an article B from the carrier 92 when assembled.

[0058] The top panel 20 comprises an article receiving arrangement that is defined by a series of displaceable flaps 20a, 20b, 20c, 20d, shaped to form four apertures 2a, 2b, 2c, 2d in blank form. The displaceable flaps 20c, 20d are hinged to adjacent first and second end panels 50, 52 respectively by fold lines 60, 64. Displaceable flap 20d is hinged via short, arcuate fold lines 4a, 4c to the top panel 20. Displaceable flap 20c is hinged via short, arcuate fold lines 4b, 4d to the top panel 20. Displaceable flaps 20a, 20b are hinged to one another along fold line 62; and are each hinged to the top panel 20 along short, arcuate fold lines 4h, 4g, 4e, 4f. Displaceable flaps 20d, 20a share a common cut line 66; and displaceable flaps 20b, 20c share a common cut line 68.

[0059] To facilitate the co-operation and locking together of the inner wraparound carrier 92 and the outer wraparound carrier 90, a mechanical interlocking mechanism is provided. The mechanical interlocking mechanism

optionally comprises one or more locking apertures provided on the inner wraparound carrier 92 and one or more corresponding and co-operating locking tabs provided in the outer wraparound carrier 90. In the present embodiment, the blank 10 is optionally provided with a locking aperture A2; and a pair of recesses R1, R2. The locking aperture A2 is formed in the second bottom panel 28. The aperture A2 is sized and positioned for receiving a locking tab from the outer wraparound carrier 92.

[0060] The first recess R1 is inset from an edge of the first bottom panel 12; and the second recess R2 is inset from an edge of the second bottom panel 28. The recesses R1, R2 are sized, positioned and arranged such that once a composite bottom wall structure 12/28 is formed, the recesses R1, R2 overlap to a sufficient extent such that a further aperture or gap R1/R2 is provided in the composite bottom wall structure 12/28, which further aperture or gap R1/R2 is sized and positioned for receiving a locking tab from the outer wraparound carrier 92.

[0061] Turning to the construction of the first inner wraparound carrier 92 as illustrated in Figures 3, 4 and 5, the first inner carrier 92 may be formed by a series of sequential folding operations in a straight line machine so that the first inner carrier 92 is not required to be rotated or inverted to complete its construction. The folding process is not limited to that described below and may be altered according to particular manufacturing requirements.

[0062] To prepare the blank 10, each pair of inwardly foldable retention tabs 46a, 44a of the heel engaging features H1, H2, H3, H4 is folded inwardly towards the adjacent first or fourth bevel panels 14, 26.

[0063] The six articles B are arranged in a 3 x 2 group having two opposite ends (of three articles) and two opposite sides (of two articles). Then the top panel 20 is aligned with the articles B such that a top closure C, for example a crown closure, of each of the four articles B on a side of the article group is beneath one of the four apertures 2a, 2b, 2c, 2d. The blank 10 is then lowered and placed over the tops of all of the articles B such that a top C of the four articles B on a side of the article group B passes through one of the apertures 2a, 2b, 2c, 2d. This action causes the displaceable flaps 20a, 20b, 20c, 20d to fold upwardly, out of the plane of the top panel 20 such that two rows of three articles each sit within an elongate aperture thereby formed in the top panel 20.

[0064] The second and third bevel panels 18, 22 are folded about fold lines 36 and 38 respectively and the first and second side panels 16, 24 are then folded about fold lines 34 and 80 until the first and second side panels 16, 24 are each disposed alongside a side of the article group. As the first and second side panels 16, 24 are folded, the four gusset panels 54a, 54b, 54c, 54d and the four web panels 56a, 56b, 56c, 56d automatically articulate the first and second end panels 50, 52, about fold lines 60, 64 respectively until the first and second end panels 50, 52 are each disposed alongside an end of the article group.

[0065] The first bottom panel 12 and first bevel panel 14 are then folded about fold lines 30 and 32 until the first and second article heel engaging features H1, H2 are located about the heels of two articles B along the side of the group and the first bottom panel 12 is disposed beneath part of the article group.

[0066] Similarly, the second bottom panel 28 and fourth bevel panel 26 are folded about fold lines 80 and 82 until the third and fourth heel engaging features H3, H4 are located about the heels of two other side articles within the group. Then, second bottom panel 28 is disposed beneath part of the article group until it partially overlaps the first bottom panel 12. The first and third apertures A1, A3 (generally triangular shaped apertures) within the second bottom panel 28 may be used by automating machinery to ensure proper positioning and relative alignment of the first and second bottom panels 12, 28.

[0067] Optionally, to form a bottom wall structure, the first and second bottom panels 12, 28 are mechanically locked together by punching the first and second male tabs M1, M2 against the first and second female tabs F1, F2. This displaces the first and second female tabs F1, F2 and creates apertures, through which the first and second male tabs M1, M2 are punched through. The shoulders of the first and second male tabs M1, M2 prevent the locking male tabs M1, M2 from returning back through the apertures formed when the first and second female tabs F1, F2 are displaced. In this way, the first and second bottom panels 12, 28 are mechanically locked together. The first and second bottom panels 12, 28 are mechanically locked together such that the group of articles B are tightly packed and held together in the carrier 92. The ends of the article group (not shown) are covered only partially by the first and second end panels 50, 52 but are otherwise exposed.

[0068] The inner wraparound carrier 92 formed from the blank 10 has a first notional tubular axis that is defined as extending between the open ends of the carrier 92, in other words between first end panel 50 and second end panel 52. The first notional tubular axis is parallel to the bottom wall structure 12/28.

[0069] The locking aperture A2 and further aperture or gap R1/R2 formed from the overlaying recesses R1, R2 are ready for receiving a locking tab from the outer wraparound carrier 90.

[0070] The outer wraparound carrier 90 is compatible with the inner wraparound carrier 92 and may take many and various forms. For example, the blank 11 shown in Figure 2 may be assembled into one such suitable outer wraparound carrier 90, it being recognised that the illustrative example provided does not limit to a particular or specific combination of inner wraparound carrier and outer wraparound carrier.

[0071] In Figure 2 it can be seen that the blank 11 comprises a series of main panels which form the main walls of a second outer carrier 92 once the second outer carrier blank 11 is assembled. The series of main panels include:

a first bottom panel 25, a first side panel 23, a first bevel panel 21, a top panel 19, a second bevel panel 17, a second side panel 15, and a second bottom panel 13. The main panels 25, 23, 21, 19, 17, 15 and 13 are hinged one to the next in series along fold lines 37, 35, 33, 31, 29 and 27.

[0072] To facilitate the mechanical interlocking of the first and second bottom panels 25, 13 of the outer wrap-around carrier 90 formed from the blank 11, the first and second bottom panels 25, 13 are provided with complementary locking means. Optionally, the illustrated complementary locking arrangement comprises two female tabs F3, F4 in the second bottom panel 13; and two male locking tabs M3, M4 in the first bottom panel 25.

[0073] Optional alignment apertures A4, A5, A6, A7, A8, A9 are provided in the second bottom panel 13 and first bottom panel 25. The alignment apertures A4, A5, A6, A7, A8, A9 facilitate the automated location of the second bottom panel 13 relative to the first bottom panel 25.

[0074] Optional article top engaging features T1, T2, are provided for engaging and securely locating the top or crown or closure 'C' of an article B. Each article top engaging feature T1, T2 is formed in part in a bevel panel 21, 17 and in part in the top panel 19. The presence of the article top engaging features T1, T2 is entirely optional; and when provided, the configuration of the top engaging feature T1, T2 may take many and various forms. As such, the configuration of each article top engaging feature T1, T2 illustrated in Figure 2 is merely an example and is in no way limiting. Optionally, each of the article top engaging features T1, T2 shown has the same configuration and therefore only one will be described.

[0075] Article top engaging feature T1 comprises an upper aperture 43 defined in part by a cut edge 45 of the top panel 19; a pair of outwardly displaceable, foldable retention tabs 47a, 47b separated by a common cut line 51 and each hinged to the first bevel panel 21 via fold lines 39a, 39b.

[0076] The blank 11 also comprises a carrying feature which is structured and arranged to enable a user to comfortably and securely grip the outer carrier 90 for carrying and lifting the package 94 (see Fig. 3) formed from the combination of the assembled blank 10, a group of articles B and the assembled blank 11. The carrying feature is symmetrical and therefore only one side will be described. A recessed region is defined in the top panel 19 and comprises a first tab 53a hinged to a centre tab 55a along angled fold line 61a and a second tab 59a hinged on the other side of the centre tab 55a by angled fold line 63a. The centre tab 55a is hinged to the top panel 19 along fold line 65a; and the first and second tabs 53a, 59a are separated from the top panel 19 by means of an optional cut line. In use the center tab 55a can be displaced out of the plane of the top panel 19 as it hinges downwardly about fold line 65a. The first and second tabs 53a, 59a are also displaced out of the plane of the top panel 19 and fold downwardly relative to the top panel

19 and slightly inwardly towards the center tab 55a. To carry the second outer wraparound carrier 90 (once assembled) a user can grip the top panel 19 using a pinching action, pressing their thumb against the center tab 55a of one side of the carrying feature and by pressing any one or more or all of their index, middle and ring fingers against the other center tab 55b and adjacent first and second tabs 53b, 59b.

[0077] Turning to the construction of the second outer wraparound carrier 90 as illustrated in Figures 3, 4 and 5, the second outer wraparound carrier 90 may be formed by a series of sequential folding operations in a straight line machine so that the second outer wraparound carrier 90 is not required to be rotated or inverted to complete its construction. The folding process is not limited to that described below and may be altered according to particular manufacturing requirements.

[0078] The top panel 19 is aligned with the articles within the first inner carrier 92 such that a top closure C, for example a crown closure, of each one of the articles B is beneath the top panel 19. The blank 11 is then lowered and placed onto the tops of the articles B such that a top C of each article B contacts an underside of the top panel 19. The first and second bevel panels 21, 17 are folded about fold lines 33 and 31 respectively and the first and second side panels 23, 15 are then folded about fold lines 35 and 29 until the first and second side panels 23, 15 are each disposed alongside an end of the article group. As the first and second bevel panels 21, 17 are folded, the article top engaging features T1, T2 are tightly fitted around the tops of the centre-most articles of the group. In this way, the second outer carrier 90 comprises an article engaging structure T1, T2 and a top portion C of at least one of the articles B of the group in the first inner carrier 92 is received, at least in part, within the top article engaging structure T1, T2 of the second outer tubular structure 90.

[0079] The second bottom panel 13 is folded about fold line 27 until the second bottom panel 13 is disposed beneath part of the bottom wall structure 12/28 of the inner wraparound carrier 92.

[0080] Similarly the first bottom panel 25 is then folded about fold line 37 until the first bottom panel 25 is disposed beneath part of the second bottom panel 13 and part of the bottom wall structure 12/28 of the inner wraparound carrier 92. The alignment apertures A4, A5, A6, A7, A8, A9 (generally triangular shaped apertures) within the second bottom panel 13 and first bottom panel 25 may be used by automating machinery to ensure proper positioning and relative alignment of the first and second bottom panels 25, 13.

[0081] Optionally, to form a bottom wall structure of the outer wraparound carrier 90, the first and second bottom panels 25, 13 are mechanically locked together by punching the first and second male tabs M3, M4 against the first and second female tabs F3, F4. This displaces the first and second female tabs F3, F4 and creates apertures, through which the first and second male tabs

M3, M4 are punched.

[0082] Advantageously, the male tabs M3, M4 of the mechanical locking mechanism of the second outer wraparound carrier 90 are aligned with the locking aperture A2 and gap R1/R2 of the first inner carrier 92. When the male tabs M3, M4 are punched through the first and second female tabs F3, F4 of the second bottom panel 13 of the outer wraparound carrier 90, the male tabs M3, M4 are also punched through one of the locking aperture A2 or gap R1/R2 of the inner carrier 92.

[0083] The shoulders of the first and second male tabs M3, M4 are pushed past the outer bottom wall structure and through and into the interior region of the first inner wraparound carrier 92. This prevents the locking male tabs M3, M4 from accidentally returning back through locking aperture A2; gap R1/R2 of the first inner carrier 92; and the apertures formed when the first and second female tabs F1, F2 are displaced. In this way, the first and second bottom panels 25, 13 are mechanically locked together to form a composite bottom wall structure of the second outer carrier 90. The inner wraparound carrier 92 and the group of six articles B are tightly packed and further held together in the outer wraparound carrier 90. The ends of the article group (not shown) are now more fully covered by the first and second side and bevel panels 23/21, 17/15 of the second outer wraparound carrier 90. Furthermore, the composite bottom wall structure of the second outer carrier 90 is mechanically locked to the composite bottom wall structure of the first inner carrier 92.

[0084] The outer wraparound carrier 90 formed from the blank 11 has a second notional tubular axis that is defined as extending between the open ends of the carrier 90. The second notional tubular axis is parallel to the bottom wall structure 25/13.

[0085] As such a package 94 is formed which comprises a first inner carrier 92 and a second outer carrier 90 with the second outer carrier 90 being disposed, at least in part, on the outside of the first inner carrier 92. The tubular axis of the first inner carrier 92 is perpendicular to the second tubular axis of the second outer carrier 90.

[0086] The two sets of carrying feature 53a/55a/59a and 53b/55b/59b, together provide a carrying handle structure and individually provide a spacer between adjacent centremost articles B3, B4 of the article group.

[0087] The carrying handle structure comprises, as described, one or more foldable tabs and optionally, in this arrangement, each set of carrying features comprises three tabs: the first tab 53a, 53b, the center tab 55a, 55b, and the second tab 59a, 59b. In Figure 5, the carrying handle structure is in use, and only part of the carrying handle structure is therefore visible. In use, the foldable tabs 53a/55a/59a, 53b/55b/59b have all been folded out of the plane of the top panel 19; and the first and second tabs 53a, 53b, and 59a, 59b have also been folded inwardly, out of the plane of the center tab 55a, 55b and toward the center tab 55a, 55b. The center tab 55a, 55b, along with the adjacent and angled first and second tabs

53a, 53b, 59a, 59b, forms a generally "U"-shaped structure that is sized and arranged to fit between the necks N of the two center most articles i.e. between bottles B3 and B4 (see Figure 5).

[0088] The two folded carrying handle features 53a/55a/59a, 53b/55b/59b are disposed on either side and partially between the centermost articles B3, B4. They can be gripped in a pinching type hold, optionally between a user's thumb, which might contact the center tab 55a, and a user's index and middle fingers, which might contact the other center tab 55b.

[0089] In this way the carrying handle features 53a/55a/59a, 53b/55b/59b can each provide, when folded downwardly into the interior of the package 94, a spacer that is positioned between two adjacent articles B3, B4 and a carrying handle for the entire package 94.

[0090] The package 94 (see Fig. 3) encloses at least a lower portion of the group of articles due to the provision of the side walls 23/21, 15/17, of the second outer carrier 90 about each of the sides of the group of articles and the provision of the side panels 16, 24 of the first inner carrier 92 about each of the ends of the group of articles. To remove an article, the shoulder S of a side-most bottle B may be pulled against the weakened arrangement 68a, 70a, 72a and pulled past the displaceable flaps 20a, 20b, 20c, 20d until a sufficiently sized gap 'O' is created such that the bottle B can be lifted out of the inner and outer wraparound carriers 90, 92 of the package 94 (see Fig. 4).

[0091] Once articles have been removed (see Fig. 5) the package 94 may comprise empty openings 'O' where a bottle B was positioned, yet the package 94 still retains much of its structural integrity. This is somewhat different to typical wraparound carriers where, upon removal of one or more articles, the wraparound carrier typically collapses. In the present arrangement the package 94 retains structural integrity, even after the removal of two or more or all bottles B5, B6 as shown. This is in part due to a keel structure or bracing structure formed by the combination of displaceable tabs 20a, 20b, fold line 62 and the arcuate short fold lines 4h, 4g, 4e, 4f at either end thereof that couple the displaceable tabs 20a, 20b to the second and third bevel panels 18, 22 respectively.

[0092] This keel structure may provide a brace across the first inner carrier 92 which helps to preserve the structural rigidity of the first inner carrier 92 even after the articles have been removed. This keel structure is optionally centrally disposed and as shown in Figure 3 has a substantially inverted "V"-shaped cross-section. The keel structure may brace or provide support between the first and second side panels 16, 24.

[0093] Referring now to Figures 6, 7 and 8, there is shown a second embodiment of the present invention wherein an alternative inner blank 110 is shown which can be combined with a second outer blank in order to construct a different package 194. For example, but without limitation, the first inner blank 110 may be combined with the second outer blank 11 of Figure 2, as illustrated in Figures 7 and 8. In the second illustrated embodiment,

like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "100" to indicate that these features belong to the second embodiment. The second embodiment shares many common features with the first embodiment and therefore only the differences from the embodiment illustrated in Figures 1 to 5 will be described in any greater detail.

[0094] The first inner blank 110 comprises a series of main panels which form the main walls of a first inner carrier 192 once the first inner blank 110 is assembled. The series of main panels include: a first bottom panel 112, a first bevel panel 114, a first side panel 116, a top panel 120, a second side panel 124, a fourth bevel panel 126 and a second bottom panel 128. The main panels 112, 114, 116, 120, 124, 126, 128 are hinged one to the next in series along fold lines 130, 132, 136, 180, 182 and 184.

[0095] Again first and second end panels 150, 152 are coupled to the top panel 120 by fold lines 160, 164, and in this arrangement the first and second end panels 150, 152 are coupled to the first and second side panels 116, 124 via four gusset panels 154a, 154b, 154c, 154d and four web panels 156a, 156b, 156c, 156d, which are hinged by fold lines 164a, 164b, 164c, 164d; 158a, 158b, 158c, 158d; and 157a, 157b, 157c, 157d respectively. The four gusset panels 154a, 154b, 154c, 154d and four web panels 156a, 156b, 156c, 156d automatically articulate the first and second end panels 150, 152 into a set up position when the blank 110 is assembled.

[0096] To facilitate the mechanical interlocking of the first and second bottom panels 112, 128, the first and second bottom panels 112, 128 are provided with complementary locking means. Optionally, the illustrated complementary locking arrangement comprises two female tabs F11, F12 in the first bottom panel 112; and two male locking tabs M11, M12 in the second bottom panel 128.

[0097] Optional alignment apertures A11, A13 are provided in the second bottom panel 128 for facilitating the automated location of the second bottom panel 128 relative to the first bottom panel 112.

[0098] Optional article heel engaging features H11, H12, H13, H14 are also provided and have a similar structure to the heel engaging features H1, H2, H3, H4 already described.

[0099] The top panel 120 comprises a different article receiving arrangement compared to the blank 10 of Figure 1. The article receiving arrangement is defined by a series of transversely arranged displaceable flaps 120, 120a, 120b, 120c, 120d, 120 that run between the end panels 150, 152 of the blank 110. The six displaceable flaps 120, 120a, 120b, 120c, 120d, 120 are shaped to form six apertures 102a, 102b, 102c, 102d, 102e, 102f in bank form.

[0100] A first part of the top panel 120 that is hinged to the first side panel 116 along fold line 136 forms a first displaceable flap having a shaped cut edge defined by cut line 166. The cut line 166 also defines a shaped cut

edge of a second displaceable flap 120a. The second displaceable flap 120a is hinged to the top panel 120 by means of a transversely extending fold line 162a and short arcuate fold lines 104a, 104b, 104c, 104d, which extend from the transversely extending fold line 162a to the adjacent first and/or second end panel 150, 152 respectively.

[0101] A third displaceable flap 120b is also hinged to the top panel 120 by means of the transversely extending fold line 162a and short arcuate fold lines 104a, 104b, 104c, 104d, which extend from the transversely extending fold line 162a to the adjacent first and/or second end panel 150, 152 respectively. The third displaceable flap 120b has a shaped cut edge defined by cut line 168. The cut line 168 also defines a shaped cut edge of a fourth displaceable flap 120c.

[0102] The fourth displaceable flap 120c is also hinged to the top panel 120 by means of a further transversely extending fold line 162b and short arcuate fold lines 104e, 104f, 104g, 104h, which extend from the transversely extending fold line 162b to the adjacent first and/or second end panel 150, 152 respectively. The fourth displaceable flap 120d has a shaped cut edge defined by cut line 169. The cut line 169 also defines a shaped cut edge of a fifth displaceable flap 120, which is part of the top panel 120 and that is hinged to the second side panel 124 along fold line 180.

[0103] To facilitate the co-operation and locking together of the inner wraparound carrier 192 formed from the blank 110 (see Figure 7) with an outer wraparound carrier 90, a mechanical interlocking mechanism is provided. The mechanical interlocking mechanism optionally comprises one or more locking apertures provided on the inner wraparound carrier 192 and the co-operating locking tabs M3, M4 provided in the outer wraparound carrier 90. In the present embodiment, the blank 110 is again optionally provided with a locking aperture A12; and a pair of similarly shaped recesses R11, R12. The locking aperture A12 is formed in the second bottom panel 128 and has a substantially octagonal shape. The aperture A12 is sized and positioned for receiving a locking tab M3, M4 from the outer wraparound carrier 90.

[0104] As in the first embodiment of Figure 1 a first recess R11 that is inset from an edge of the first bottom panel 112; and a second recess R12 that is inset from an edge of the second bottom panel 128 are sized, positioned and arranged such that once the bottom wall structure 112/128 is formed, the recesses R11, R12 overlap to a sufficient extent that a further aperture or gap R11/R12 is provided in the bottom wall structure 112/128, which further aperture or gap R11/R12 is sized and positioned for receiving a locking tab M3, M4 from the outer wraparound carrier 90.

[0105] The construction of the first inner wraparound carrier 192 (see Figure 7) is similar to that already described in relation to the first inner wraparound carrier 92, albeit, when the top panel 120 is lowered and placed over the tops of the articles B1, B2, B3, B4, B5, B6, a top

C of each article B1, B2, B3, B4, B5, B6 passes through one of the apertures 102a, 102c, 102e, 102b, 102d, 102f. This action causes the displaceable flaps 120, 120a, 120b, 120c, 120d, 120 to each fold upwardly about fold lines 136, 162a, 162b and 180 respectively such that three transverse rows, each comprising two articles B1/B4, B2/B5, B3/B6, are disposed within a transverse aperture 102a/102b, 102c/102d, 102e/103f, thereby formed.

[0106] The first and second side panels 116, 124 are then folded about fold lines 136 and 180 until they are each disposed alongside a side of the article group. Again, this action automatically articulates the first and second end panels 150, 152, about fold lines 160, 164 respectively until the first and second end panels 150, 152 are each disposed alongside part of an end of the article group (see Figure 7).

[0107] The first bottom panel 112 and first bevel panel 114 are folded as described before, with the first and second article heel engaging features H11, H12 being located about the heels of two articles B4, B1 along a first side B1/B4 of the group of articles and with the first bottom panel 112 being disposed beneath part of the article group.

[0108] Similarly, the second bottom panel 128 and fourth bevel panel 126 are folded as described before with the third and fourth heel engaging features H13, H14 being located about the heels of two articles B6, B3 along a second side B3/B6 of the group of articles and with the second bottom panel 128 being disposed beneath part of the article group and in partial overlapping relationship with the first bottom panel 112. The mechanical interlocking mechanism M11, M12, F11, F12 can then be operated to secure the first and second bottom panels 112, 128 together as previously described.

[0109] In this way, the first and second bottom panels 112, 128 are mechanically locked together such that the group of articles B1, B2, B3, B4, B5, B6 is tightly packed and held together within the first carrier 192. The ends B1/B2/B3, B4/B5/B6 of the article group (see Figure 7) are covered only partially by the first and second end panels 150, 152 but are otherwise exposed. A first keel structure or bracing structure is formed by the combination of displaceable tabs 120a, 120b, fold line 162a and the arcuate short fold lines 104a, 104c, 104b, 104d at either end thereof that couple the displaceable tabs 120a, 120b to the top panel 120. The first keel structure forms a brace between a first row of articles B1/B4 and a second row of articles B2/B5.

[0110] A second keel structure or bracing structure is formed by the combination of displaceable tabs 120c, 120d, fold line 162b and the arcuate short fold lines 104e, 104g, 104f, 104h at either end thereof that couple the displaceable tabs 120c, 120d to the top panel 120. The second keel structure forms a brace between the second row of articles B2/B5 and a third row of articles B3/B6.

[0111] The keel structure may provide a structural brace across the first inner carrier 92 which helps to pre-

serve the structural rigidity of the first inner carrier 92 even after the articles have been removed. Optionally the keel structure has a substantially inverted "V" shaped cross-section. The keel structure may brace or provide support between the first and second side panels 15, 23 of a second outer carrier 90.

[0112] The locking aperture A12 and further aperture or gap R11/R12 formed from the overlaying recesses R11, R12 are ready for receiving a locking tab M3, M4 from the outer wraparound carrier 90.

[0113] The outer wraparound carrier 90 compatible with the inner wrap around carrier 92 may take many and various forms. For example, the blank 11 shown in Figure 2 may be assembled into one such suitable outer wrap-around carrier 90, it being recognised that the illustrative example provided does not limit to a particular or specific combination of inner wraparound carrier and outer wrap-around carrier.

[0114] The second outer wraparound carrier 90 may be assembled about the inner carrier 92 and article group B1-B6 shown in Figure 7, in the same manner as described above, with the top panel 19 being placed onto the tops of the articles B1-B6 and such that the first and second bevel panels 21, 17 and the first and second side panels 23, 15 are folded until the article top engaging features T1, T2 are tightly fitted around the tops of the centre-most articles B2, B5 of the group.

[0115] The second bottom panel 13 is folded about fold line 27 until the second bottom panel 13 is disposed beneath part of the bottom wall structure 112/128 of the inner wraparound carrier 192.

[0116] Similarly the first bottom panel 25 is then folded about fold line 37 until the first bottom panel 25 is disposed beneath part of the second bottom panel 13 and part of the bottom wall structure 112/128 of the inner wraparound carrier 192.

[0117] Again, to form a bottom wall structure of the outer wraparound carrier 90, the first and second bottom panels 25, 13 are mechanically locked together by punching the first and second male tabs M3, M4 against the first and second female tabs F1, F2. This displaces the first and second female tabs F1, F2 and creates apertures, through which the first and second male tabs M3, M4 are punched.

[0118] Advantageously, the male tabs M3, M4 of the mechanical locking mechanism of the second outer wraparound carrier 90 are aligned with the locking aperture A12 and gap R11/R12 of the first inner carrier 192. When the male tabs M3, M4 are punched through the first and second female tabs F1, F2 of the second bottom panel 13 of the outer wraparound carrier 90, the male tabs M3, M4 are also punched through one of the locking aperture A12 and gap R11/R12 of the inner carrier 192.

[0119] The first and second bottom panels 25, 13 are mechanically locked together to form a composite bottom wall structure of the second outer carrier 90. The inner wraparound carrier 192 and the group of six articles B1-B6 are tightly packed and further held together in the

outer wraparound carrier 90. The ends of the article group B1/B2/B3, B4/B5/B6 are now more fully covered by the first and second side and bevel panels 23/21, 17/15 of the second outer wraparound carrier 90. Furthermore, the composite bottom wall structure 25/13 of the second outer carrier 90 is mechanically locked to the composite bottom wall structure 112/128 of the first inner carrier 192.

[0120] As before, the outer wraparound carrier 90 formed from the blank 11 has a second notional tubular axis that is defined as extending between the open ends of the carrier 90. The second notional tubular axis is parallel to the bottom wall structure 112/128.

[0121] As such a package 194 is formed which comprises a first inner carrier 192 and a second outer carrier 90 with the second outer carrier 90 being disposed, at least in part, on the outside of the first inner carrier 192. The tubular axis of the first inner carrier 192 is perpendicular to the second tubular axis of the second outer carrier 90.

[0122] As shown in Figure 8, the two sets of carrying feature 53a/55a/59a and 53b/55b/59b together provide a carrying handle structure and individually provide a spacer between adjacent centremost articles B2, B5 of the article group.

[0123] Once articles have been removed (not shown) the package 194 may again comprise empty openings 'O' where a bottle B1-B6 was positioned, yet the package 194 still retains much of its structural integrity. This is in part due to the transverse keel structure or bracing structure formed by the combination of displaceable tabs 120a, 120b, 120c, 120d fold lines 162a, 162b and the arcuate short fold lines 104a, 104b, 104c, 104d, 104e, 104f, 104g, 104h at either end thereof that couple the displaceable tabs 120a, 120b, 120c, 120d to the end panels 150, 152 respectively.

[0124] This keel structure may provide a brace across the first inner carrier 192 which helps to preserve the structural rigidity of the first inner carrier 192 even after the articles B1-B6 have been removed. The keel structures are optionally centrally disposed and as shown in Figure 6 provide two transverse structures with inverted "V" shaped cross-sections. The keel structures may brace or provide support between the first and second side panels 116, 124.

[0125] Referring now to Figures 9, 10, 11 and 12, there is shown another embodiment of the present invention wherein an alternative inner blank 210 is shown which can be combined with the second outer blank 11 of Figure 2 in order to construct a different package 294. In the third illustrated embodiment like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "200" to indicate that these features belong to the third embodiment. The third embodiment shares many common features with the first embodiment and therefore only the differences from the embodiment illustrated in Figures 1 to 5 will be described in any greater detail.

[0126] Referring now to Figure 9, there is shown a plan

view from above of a first inner blank 210 according to the third embodiment of the disclosure. The first inner blank 210 is also optionally a wraparound style blank 210 and is suitable for being paired with a second outer blank, such as but not limited to, the second outer blank 11 shown in Figure 2.

[0127] The first inner blank 210 again comprises a series of main panels which form the main walls of a first inner carrier 292 shown in Figures 10, 11 and 12. The series of main panels includes: a first bottom panel 212, a first bevel panel 214, a first side panel 216, a top panel 220, a second side panel 224, a fourth bevel panel 226 and a second bottom panel 228. The main panels 212, 214, 216, 220, 224, 226, 228 are hinged one to the next in series along fold lines 230, 232, 236, 280, 282 and 284.

[0128] The first inner blank 210 optionally does not comprise second and third bevel panels either side of the top panel 220, and also does not comprise any end panels. Similarly to the first inner blank 10 of Figure 1, the first inner blank 210 does comprise a mechanical interlocking means for the first and second bottom panels 212, 228. Optionally, the illustrated complementary locking arrangement comprises two female tabs F21, F22 in the first bottom panel 212; and two male locking tabs M21, M22 in the second bottom panel 228.

[0129] The first inner blank 210 also optionally comprises alignment apertures A21, A23; optional article heel engaging features H21, H22, H23, H24 which operate in the same manner as heel engaging features H1, H2, H3, H4 of blank 10; and a pair of recesses R21, R22 which are provided, as before, to facilitate the co-operation and locking together of the inner wraparound carrier 292 and the outer wraparound carrier 90.

[0130] The top panel 220, as shown in Figure 9, also comprises an article receiving arrangement that is also optionally defined by a series of four longitudinally extending, displaceable flaps 220a, 220b, 220c, 220d. In this arrangement however, the four displaceable flaps 220a, 220b, 220c, 220d are shaped to form six apertures 202a, 202b, 202c, 202d, 202e, 202f in blank form. A common cut line 266 separates displaceable flaps 220a, 220b; and similarly, a common cut line 268 separates displaceable flaps 220c, 220d. The common cut lines 266, 268 are interrupted by the apertures 202a, 202b, 202c, 202d, 202e, 202f respectively. In other embodiments, the optional apertures 202a, 202b, 202c, 202d, 202e, 202f may be omitted, beneficially however, they provide a clear indication for alignment of the top panel 220 with the article group.

[0131] Additionally, the outermost displaceable flaps 220a and 220d are hinged to the top panel 220 by means of curved or arcuate fold lines 204a, 204c, 204b and 204d respectively. The curved fold lines 204a, 204c, 204b and 204d are longer in length than the short arcuate fold lines 4a, 4b, 4c, 4d of the first embodiment. This may be in order to ensure that the outermost displaceable flaps 220a, 220d are attached to the top panels 220 by a sufficiently strong connection because there are no end pan-

els in this arrangement.

[0132] Similarly the centre-most displaceable flaps 220b, 220c, as well as being hinged to one another along a common fold line 262, are hinged to the top panel 220 via long arcuate fold lines 204e, 204f, 204g, 204h.

[0133] In this embodiment, however, the displaceable flaps 220a, 220b, 220c, 220d are folded downwardly out of the plane of the top panel 220. Optionally this may be achieved by pushing the bottoms of the bottles B1, B2, B3, B4, B5, B6 onto the top panel 220 which causes the flaps 220a, 220b, 220c, 220d to fold to create an opening for the two rows of three bottles B1/B2/B3, B4/B5/B6.

[0134] To complete the construction of the first inner wraparound carrier 292, the first and second side panels 216, 224 are then disposed alongside one of the sides B1/B2, B3/B6 of the article group. The first bottom panel 212 and first bevel panel 214 are then folded until the first and second article heel engaging features H21, H22 are located about the heels of the two articles B3, B6 on one side of the group and then the second bottom panel 228 and fourth bevel panel 226 are folded until the third and fourth heel engaging features H23, H24 are located about the heels of the two articles B1, B2 on the other side of the article group. Then, to form a bottom wall structure, the first and second bottom panels 212, 228 are mechanically locked together by punching the first and second male tabs M21, M22 against the first and second female tabs F21, F22.

[0135] Alternatively the displaceable flaps 220a, 220b, 220c, 220d may be folded downwardly out of the plane of the top panel 220 in a pre-assembly step, after which the open top panel 220 is located onto the tops of the articles B1, B2, B3, B4, B5, B6, and by relative movement of the blank 210 and articles, the blank 210 is then pulled down the necks of the articles B1, B2, B3, B4, B5, B6 and the construction of the blank 210 about the articles group completed as described before.

[0136] However formed, the inner wraparound carrier 292 formed from the blank 210 has a first notional tubular axis that is defined as extending between the open ends of the carrier 292, in other words along a line running through the middle of the centremost articles B2, B5. The first notional tubular axis is parallel to the bottom wall structure 212/228.

[0137] The locking aperture A22 and further aperture or gap R21/R22 formed from the overlaying recesses R21, R22 are again ready for receiving a locking tab from an outer wraparound carrier 90.

[0138] The outer wraparound carrier compatible with the inner wraparound carrier 292 may take many and various forms. For example, the blank 11 shown in Figure 2 may be assembled into one such suitable outer wraparound carrier 90, it being recognised that the illustrative example provided does not limit to a particular or specific combination of inner wraparound carrier and outer wraparound carrier.

[0139] The outer wraparound carrier 90 and its assembly need not be described again and in Figures 10 and

12 the package 294 can be seen. Once articles have been removed (see Fig. 11 for a partially emptied package 294) the package 294 may comprise two empty openings 'O' where bottles B1-B6 were positioned, yet the package 294 still retains much of its structural integrity. The package 294 again retains structural integrity, even after the removal of two B4, B1 bottles shown, or more bottles. This is in part due to a keel structure or bracing structure formed by the combination of displaceable tabs 220b, 220c, fold line 262 and the arcuate fold lines 204h, 204g, 204e, 204f at either end thereof.

[0140] This keel structure again may provide a brace across the first inner carrier 292 which helps to preserve the structural rigidity of the first inner carrier 292 even after the articles have been removed. This keel structure is optionally centrally disposed and as shown in Figure 11 has a substantially inverted "V" shaped cross-section. The keel structure may brace or provide support between the first and second side panels 216, 224.

[0141] Referring now to Figures 13 to 16, there is shown a further embodiment of the present invention wherein an inner blank 310 may be combined with a second outer blank 311 in order to construct an alternative package 394. In the fourth illustrated embodiment like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "300" to indicate that these features belong to the fourth embodiment. This embodiment shares many common features with the previous embodiments and therefore only the differences from the embodiments illustrated in Figures 1 to 12 will be described in any greater detail.

[0142] A first inner blank 310 is shown in Figure 14 comprising a series of main panels which form the main walls of a first inner carrier 392 once the first inner blank 310 is assembled. The series of main panels includes: a first bottom panel 312, a first bevel panel 314, a first side panel 316, a top panel 320, a second side panel 324, a second bevel panel 326 and a second bottom panel 328. The main panels 312, 314, 316, are hinged one to the next in series along fold lines 330 and 332. The main panels 324, 326, 328 are hinged one to the next in series along fold lines 382 and 384.

[0143] The first side panel 316 is coupled to the top panel 320 by a plurality of fold lines 304a, 304b and portions of fold lines 373a, 373b. The top panel 320 is coupled to the second side panel 324 by a plurality of fold lines 304c, 304d and portions of fold lines 373c, 373d.

[0144] To facilitate the mechanical interlocking of the first and second bottom panels 312, 328, the first and second bottom panels 312, 328 are provided with complementary locking means. Optionally, the illustrated complementary locking arrangement comprises two female tabs F31, F32 in the first bottom panel 312; and two male locking tabs M31, M32 in the second bottom panel 328.

[0145] Optional alignment apertures A33, A35 are provided in the first bottom panel 312. Optional alignment apertures A31, A32 are provided in the second bottom

panel 328. The alignment apertures A31, A32 facilitate the automated location of the second bottom panel 328 relative to the first bottom panel 312. The alignment apertures A31, A32, A33, A35 are shaped and configured to allow movement of a machine component in two directions during assembly of the package 394.

[0146] A machine component may be inserted into the alignment apertures A31, A32, A33, A35 to engage with the first and second bottom panels 312, 328 during assembly of the first inner carrier 392 about a group of articles B1, B2, B3, B4. The alignment apertures A31, A32, A33, A35 may facilitate tightening of the first inner carrier 392 about the group of articles B1, B2, B3, B4. The machine component may engage the first and second bottom panels 312, 328, via a first lobe of the alignment apertures A31, A32, A33, A35, movement of the machine component in a direction substantially transverse to the tubular axis of the first inner carrier 392 allows the degree of overlap between the first and second bottom panels 312, 328 to be adjusted.

[0147] A machine component may be inserted into the alignment apertures A31, A32, A33, A35 during assembly of the second outer carrier 390 about the first inner carrier 392 and group of articles B1, B2, B3, B4. The alignment apertures A31, A32, A33, A35 may facilitate or enable tightening of the second outer carrier 390 about the first inner carrier 392 and the group of articles B1, B2, B3, B4. The machine component may pass through the first and second bottom panels 312, 328, the alignment apertures A31, A32, A33, A35 each comprises a second lobe arranged to facilitate or allow movement of the machine component in a direction substantially parallel to the tubular axis of the first inner carrier 392 during the assembly of the second outer carrier 390. The machine component may optionally engage with the first and second bottom panels 312, 328 of the first inner carrier 392 when the second outer carrier 390 is being assembled thereabout, so as to align the first inner carrier 392 with respect to the second outer carrier 390.

[0148] Optionally, the alignment apertures A33, A35 are substantially heart shaped, although other shapes comprising two or more lobes may be employed for example, but not limited to, a kidney shape.

[0149] Optional article heel engaging features H31, H32, H33, H34 are provided for engaging and securely locating the heel of an article. Each heel engaging feature H31, H32, H33, H34 is formed in one of the bevel panels 314, 326. Optionally, each of the four heel engaging features shown has the same configuration and therefore only the first heel engaging feature H32 will be described.

[0150] First heel engaging feature H32 comprises a first heel receiving aperture 340a. The first heel receiving aperture 340a is substantially "W" shaped along a first edge and sides and is substantially "U" shaped along a second edge, the second edge defining in part a boundary between the first bottom panel 312 and the first bevel panel 314.

[0151] The blank 310 is optionally provided with a pair

of recesses R31, R32. A first recess R31 is inset from an edge of the first bottom panel 312; and a second recess R32 is inset from an edge of the second bottom panel 328. The recesses R31, R32 are sized, positioned and arranged such that once a composite bottom wall structure 312/328 is formed, the recesses R31, R32 overlap to a sufficient extent that an aperture or gap R31/R32 is provided in the composite bottom wall structure 312/328, which aperture or gap R31/R32 is sized and positioned for receiving a locking tab M33 from the outer wraparound carrier 390.

[0152] The top panel 320 comprises one or more article receiving apertures 302a, 302b, 302c, 302d. Each article receiving aperture 302a, 302b, 302c, 302d is configured to receive a neck portion of a respective one of the articles B1, B2, B3, B4. The illustrated embodiment comprises four article receiving apertures 302a, 302b, 302c, 302d, in alternative embodiments a single or other plurality of article receiving apertures may be provided.

[0153] The first side panel 316 comprises a plurality of fold lines which facilitate folding the first side wall about a first side of the group of articles B1, B2, B3, B4.

[0154] A first fold line 368a may be provided, the first fold line 368a extends substantially between a first article receiving aperture 302a and the first heel receiving aperture 340a.

[0155] A second fold line 368b may be provided, the second fold line 368b extends substantially between a second article receiving aperture 302b and a second heel receiving aperture 340b in the first bevel panel 314.

[0156] A third fold line 372a may be provided; the third fold line 372a extends from the fold line 332 towards the top panel 320. Optionally, the third fold line 372a extends across a substantial portion of the first side panel 316, that is to say more than 50 percent of the height of the first side panel 316. The third fold line 372a may extend into the first bevel panel 314. The third fold line 372a is optionally parallel with each of the first and second fold lines 368a, 368b.

[0157] A fourth fold line 373a extends from a first side edge of the first side panel 316 to the second article receiving aperture 302b.

[0158] A fifth fold line 373b extends from a second side edge of the first side panel 316 to the first article receiving aperture 302a.

[0159] The fifth fold line 373b and fourth fold line 373a intersect one another and portions thereof define in part a first diamond shaped panel portion struck from the first side panel 316.

[0160] A sixth fold line 375a extends from a first side edge of the first side panel 316 to the center of the first side panel 316.

[0161] A seventh fold line 375b extends from a second side edge of the first side panel 316 to the center of the first side panel 316 so as to meet or intersect with the sixth fold line 375a. Portions of the sixth fold line 375a and seventh fold line 375b define in part the first diamond shaped panel portion.

[0162] A fold line extends across the first diamond shaped panel portion from a vertex between the sixth fold line 375a and seventh fold line 375b and a vertex between the fifth fold line 373b and fourth fold line 373a.

5 The fold line may in some embodiments be a portion of the third fold line 372a. The fold line may in some embodiments be collinear with the third fold line 372a.

[0163] Two further substantially diamond shaped panel portions are defined in part by the fold lines 373a, 373b, 375a, 375b 304a and 304b. A second diamond shaped panel portion is disposed adjacent to the first diamond shaped panel portion; the second diamond shaped panel portion is interrupted or bounded in part by the first article receiving aperture 302a. The second diamond shaped panel portion and the first diamond shaped panel portion share a portion of fold line 373a in common. The first fold line 368a extends across the second diamond shaped panel portion from a vertex, defined by the fold lines 375a, 373a, to the first article receiving aperture 302a.

10 **[0164]** A third diamond shaped panel portion is disposed adjacent to the first diamond shaped panel portion; the third diamond shaped panel portion is interrupted or bounded in part by the second article receiving aperture 302b. The third diamond shaped panel portion and the first diamond shaped panel portion share a portion of fold line 373b in common. The second fold line 368b extends across the third diamond shaped panel portion from a vertex, defined by the fold lines 375b, 373b, to the second article receiving aperture 302b.

20 **[0165]** A pair of divergently arranged fold lines 370a, 370b extends downwardly from the vertex between the sixth fold line 375a and seventh fold line 375b. A first one 370a of the pair of divergently arranged fold lines 370a, 370b converges with the first fold line 368a. A second one 370b of the pair of divergently arranged fold lines 370a, 370b converges with the second fold line 368b.

25 **[0166]** The blank 310 may comprise additional fold lines; a fold line may extend from the first fold line 368a to an inner edge of the first heel engaging aperture 340a; a fold line may extend from the second fold line 368b to an inner edge of the second heel engaging aperture 340b; a fold line may extend from the first article receiving aperture 302a to the first side edge of the first side panel 316 so as to define in part a triangular gusset panel with the fold line 304a; a fold line may extend from the second article receiving aperture 302b to the second side edge of the first side panel 316 so as to define in part a triangular gusset panel with the fold line 304b.

30 **[0167]** The second side panel 324 comprises a plurality of fold lines 368c, 368d, 372b, 370c, 370d, 373c, 373d, 375c, 375d which facilitate folding the second side wall 324 about a second side of the group of articles B1, B2, B3, B4. The arrangement of said plurality of fold lines 368c, 368d, 372b, 370c, 370d, 373c, 373d, 375c, 375d is substantially similar to that described above in relation to the first side panel 316 and will not be described in further detail.

35 **[0168]** A second outer blank 311 shown in Figure 13

comprises a series of main panels which form the main walls of a first inner carrier 392 once the second outer blank 311 is assembled. The series of main panels includes: a first bottom panel 325, a first side panel 323, a top panel 319, a second side panel 315 and a second bottom panel 313. The main panels 325, 323 are hinged one to the next by fold line 337. The main panels 315, 313 are hinged one to the next by fold line 327.

[0169] The first side panel 323 is coupled to the top panel 319 by a plurality of fold lines 305a, 305b and portions of fold lines 383a, 383b. The top panel 319 is coupled to the second side panel 315 by a plurality of fold lines 305c, 305d and portions of fold lines 383c, 383d.

[0170] To facilitate the mechanical interlocking of the first and second bottom panels 325, 313, the first and second bottom panels 325, 313 are provided with complementary locking means. Optionally, the illustrated complementary locking arrangement comprises a female tab F33 in the first bottom panel 325; and a male locking tab M33 in the second bottom panel 313.

[0171] Optional alignment apertures A37, A38 are provided in the first bottom panel 325. Optional alignment apertures A34, A36 are provided in the second bottom panel 313. The alignment apertures A37, A38, A34, A36 facilitate the automated location of the second bottom panel 313 relative to the first bottom panel 325.

[0172] A machine component may be inserted into the alignment apertures A34, A36, A37, A38 to engage with the first and second bottom panels 325, 313 during assembly of the second outer carrier 390. The alignment apertures A34, A36, A37, A38 may facilitate tightening of the second outer carrier 390 about the first inner carrier 392 and the group of articles B1, B2, B3, B4. The machine component may engage the first and second bottom panels 312, 328, via the alignment apertures A34, A36, A37, A38, movement of the machine component in a direction substantially transverse to the tubular axis of the second outer carrier 390 allows the degree of overlap between the first and second bottom panels 325, 313 to be adjusted.

[0173] Optionally, the alignment apertures A34, A36, A37, A38 are substantially triangular in shape, although other shapes may be employed.

[0174] The top panel 319 comprises one or more article receiving apertures 302e, 302f, 302g, 302h. Each article receiving aperture 302e, 302f, 302g, 302h is configured to receive a neck portion of a respective one of the articles B1, B2, B3, B4. Each of the article receiving apertures 302e, 302f, 302g, 302h in the top panel 319 is configured to be disposed in vertical registry with a respective one of the article receiving apertures 302a, 302b, 302c, 302d in the top panel 320 of the first inner carrier 392.

[0175] The illustrated embodiment comprises four article receiving apertures 302e, 302f, 302g, 302h, in alternative embodiments a single or other plurality of article receiving apertures may be provided.

[0176] The first side panel 323 comprises a plurality of fold lines which facilitate folding the first side panel 323

about a third side of the group of articles B1, B2, B3, B4.

[0177] A first fold line 378a may be provided, the first fold line 378a extends downwardly from a first article receiving aperture 302e towards the first bottom panel 325.

[0178] A second fold line 378b may be provided, the second fold line 378b extends downwardly from a second article receiving aperture 302f towards the first bottom panel 325.

[0179] A third fold line 382a may be provided; the third fold line 382a extends from the fold line 337 towards the top panel 319. Optionally, the third fold line 382a extends across a substantial portion of the first side panel 323, that is to say more than 50 percent of the height of the first side panel 323. The third fold line 382a is optionally parallel with each of the first and second fold lines 378a, 378b.

[0180] A fourth fold line 383a extends from a first side edge of the first side panel 323 to the second article receiving aperture 302f.

[0181] A fifth fold line 383b extends from a second side edge of the first side panel 323 to the first article receiving aperture 302e.

[0182] The fifth fold line 383b and fourth fold line 383a intersect one another and portions thereof define in part a diamond shaped panel struck from the first side panel 323.

[0183] A sixth fold line 385a extends from a first side edge of the first side panel 323 to the center of the first side panel 323.

[0184] A seventh fold line 385b extends from a second side edge of the first side panel 323 to the center of the first side panel 323 so as to meet or intersect with the sixth fold line 385a. Portions of the sixth fold line 385a and seventh fold line 385b define in part the diamond shaped panel.

[0185] A fold line extends across the diamond shaped panel from a vertex between the sixth fold line 385a and seventh fold line 385b and a vertex between the fifth fold line 383b and fourth fold line 383a. The fold line may in some embodiments be a portion of the third fold line 382a. The fold line may in some embodiments be collinear with the third fold line 382a.

[0186] A pair of divergently arranged fold lines 380a, 380b extends downwardly from the vertex between the sixth fold line 385a and seventh fold line 385b. A first one 380a of the pair of divergently arranged fold lines 380a, 380b converges with the first fold line 378a. A second one 380b of the pair of divergently arranged fold lines 380a, 380b converges with the second fold line 378b.

[0187] The second side panel 315 comprises a plurality of fold lines 378c, 378d, 382b, 380c, 380d, 383c, 383d, 385c, 385d which facilitate folding the second side wall 315 about a second side of the group of articles B1, B2, B3, B4. The arrangement of said plurality of fold lines 378c, 378d, 382b, 380c, 380d, 383c, 383d, 385c, 385d is substantially similar to that described above in relation to the first side panel 323 and will not be described in further detail.

[0188] Referring now to Figure 15 the first inner blank 310 and second outer blank 311 form a package 394. Figure 15 illustrates the second side panel 324 of the first inner carrier 392 and the second side panel 315 of the second outer carrier 390.

[0189] An upper portion of the second side panel 324 of the first inner carrier 392 is folded or deformed about shoulders of the articles B1, B2. The first diamond shaped panel portion is displaced inwardly into a void between the articles B1, B2, so as to form a recessed panel portion. The recessed panel portion forms a valley trough.

[0190] The second and third diamond shaped panel portions may be deformed about a respective one of the articles B1, B2 so as to form a close fit therewith.

[0191] The second and third diamond shaped panel portions may be bent about the shoulder of the respective one of the articles B1, B2 such that the second and third diamond shaped panel portions are non-coplanar with the remainder of the second side panel 324.

[0192] An upper portion of the second side panel 315 of the second outer carrier 390 is folded or deformed about shoulders of the articles B1, B3. The first diamond shaped panel portion is displaced inwardly into a void between the articles B1, B3, so as to form a recessed panel portion. The recessed panel portion forms a valley trough.

[0193] The second and third diamond shaped panel portions of the second side panel 315 may be deformed about a respective one of the articles B1, B3 so as to form a close fit therewith.

[0194] The second and third diamond shaped panel portions of the second side panel 315 may be bent about the shoulder of the respective one of the articles B1, B3 such that the second and third diamond shaped panel portions are non-coplanar with the remainder of the second side panel 315.

[0195] Figure 16 illustrates a portion of the composite bottom panel 312, 328; the articles B1, B2, B3, B4 have been removed for illustrative purposes.

[0196] The male tab M32 has passed through the first bottom panel 312, in doing the female tab F32 was displaced out of the plane of the first bottom panel 312. The female tab F32 bears against the male tab M32. The inherent resilience of the material from which the blank 310 is formed biases the female tab F32 against the male tab M32, so as to hold in a folded position. The male tab M31 and female tab F31 are similarly arranged albeit not visible in Figure 16.

[0197] The male tab M33 of the second outer carrier 390 has passed through the first bottom panel 325 of the second outer carrier 390. In doing the female tab F33 was displaced out of the plane of the first bottom panel 325. The female tab F33 bears against the male tab M33. The inherent resilience of the material from which the blank 311 is formed biases the female tab F33 against the male tab M33, so as to hold in a folded position. The male and female tabs M33, F33 have also passed through the composite bottom panel 312/328 of the first

inner carrier 392. The male and female tabs M33, F33 are received in the aperture in the composite bottom panel 312/328 formed by the recesses R31, R32. The male tab M33 may be substantially arrowhead shaped and comprise engaging shoulders, the engaging shoulders may be in locking engagement with the composite bottom panel 312/328 of the first inner carrier 392 so as to lock the composite bottom panel 312/328 of the first inner carrier 392 to the composite bottom panel 325/313 of the second outer carrier 390.

[0198] Figure 16 also illustrates the relationship between the alignment apertures A31, A32, A33, A35 in the first inner carrier 392 and the alignment apertures A34, A36, A37, A38 in the second outer carrier 390.

[0199] The alignment apertures A31, A32, A33, A35 in the first inner carrier 392 allow a machine tool to pass through both the composite bottom panel 325/313 of the second outer carrier 390 and the composite bottom panel 312/328 of the first inner carrier 392. The alignment apertures A31, A32, A33, A35 in the first inner carrier 392 are shaped and/or dimensioned such that the machine tool when inserted has freedom to move the first and second bottom panels 325, 313 of the second outer carrier 390 with respect to each other.

[0200] Referring now to Figures 17 to 19, there is shown a further embodiment of the present invention wherein an inner blank 410 may be combined with a second outer blank 411 in order to construct an alternative package 494. In the fifth illustrated embodiment, like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "400" to indicate that these features belong to the fifth embodiment. This embodiment shares many common features with the previous embodiments and therefore only the differences from the embodiments illustrated in Figures 1 to 16 will be described in any greater detail.

[0201] Figure 18 illustrates a first inner blank 410 comprising a series of main panels which form the main walls of a first inner carrier 492 once the first inner blank 410 is assembled. The series of main panels include: a first bottom panel 412, a first bevel panel 414, a first side panel 416, a top panel 420, a second side panel 424, a second bevel panel 426 and a second bottom panel 428. The main panels 412, 414, 416, are hinged one to the next in series by respective fold lines. The main panels 424, 426, 428 are hinged one to the next in series by respective fold lines.

[0202] The first side panel 416 is coupled to the top panel 420 by a plurality of fold lines 473a, 473b, 436a, 436b. The top panel 320 is coupled to the second side panel 324 by a plurality of fold lines 438a, 438b, 473c, 473d.

[0203] To facilitate the mechanical interlocking of the first and second bottom panels 412, 428, the first and second bottom panels 412, 428 are provided with complementary locking means. Optionally, the illustrated complementary locking arrangement comprises two female tabs F41, F42 in the first bottom panel 412; and two

male locking tabs M41, M42 in the second bottom panel 428.

[0204] Optional alignment apertures A43, A45 are provided in the first bottom panel 412. Optional alignment apertures A41, A42 are provided in the second bottom panel 428. The alignment apertures A41, A42 facilitate the automated location of the second bottom panel 428 relative to the first bottom panel 412. The alignment apertures A41, A42, A43, A45 are shaped and configured to allow movement of a machine component in two directions during assembly of the package 494.

[0205] Optionally, the alignment apertures A43, A45 are substantially heart shaped, although other shapes comprising two or more lobes may be employed for example, but not limited to, a kidney shape.

[0206] Optional article heel engaging features H41, H42, H43, H44 are provided for engaging and securely locating the heel of an article. Each heel engaging feature H41, H42, H43, H44 is formed in one of the bevel panels 414, 426. Optionally, each of the four heel engaging features shown has the same configuration and therefore only the first heel engaging feature H42 will be described.

[0207] First heel engaging feature H42 comprises a first heel receiving aperture 440a. The first heel receiving aperture 440a is substantially "U" shaped.

[0208] The blank 410 is optionally provided with a pair of recesses R41, R42. A first recess R41 is inset from an edge of the first bottom panel 412; and a second recess R42 is inset from an edge of the second bottom panel 428. The recesses R41, R42 are sized, positioned and arranged such that once a composite bottom wall structure 412/428 is formed, the recesses R41, R42 overlap to a sufficient extent that an aperture or gap R41/R42 is provided in the composite bottom wall structure 412/428, which aperture or gap R41/R42 is sized and positioned for receiving a locking tab M43 from the outer wraparound carrier 490.

[0209] The top panel 420 comprises one or more article receiving apertures 402a, 402b, 402c, 402d. Each article receiving aperture 402a, 402b, 402c, 402d is configured to receive a neck portion of a respective one of the articles B1, B2, B3, B4, see Figure 19. The illustrated embodiment comprises four article receiving apertures 402a, 402b, 402c, 402d, in alternative embodiments a single or other plurality of article receiving apertures may be provided.

[0210] The first side panel 416 comprises a plurality of fold lines which facilitate folding the first side wall 416 about a first side of the group of articles B1, B2, B3, B4.

[0211] A first fold line 472a may be provided; the first fold line 472a extends substantially between the first bevel panel 414 and the top panel 420. The first fold line bisects the first side panel 416.

[0212] The first fold line 472a may be collinear with a fold line 462 which extends across and bisects the top panel 420.

[0213] A second fold line 436a may be provided; the second fold line 436a extends from a first side edge of

the first side panel 416 to the center of the first side panel 416 and intersects with the first fold line 472a.

[0214] A third fold line 436b may be provided; the third fold line 436b extends from a second side edge of the first side panel 416 to the center of the first side panel 416 so as to meet or intersect with the second fold line 436a and the first fold line 472a.

[0215] A fourth fold line 473a extends from a first side edge of the first side panel 416 to the vertex defined by the intersection of the first, second and third fold lines 472a, 436a, 436b. The fourth fold line 473a together with the second fold line 436a defines at least in part a first web panel which may be substantially triangular in shape.

[0216] A fifth fold line 473b extends from a second side edge of the first side panel 416 to the vertex defined by the intersection of the first, second and third fold lines 472a, 436a, 436b. The fifth fold line 473b together with the third fold line 436b defines at least in part a second web panel which may be substantially triangular in shape.

[0217] The second side panel 424 comprises a plurality of fold lines 438a, 438b, 472b, 473c, 473d which facilitate folding the second side wall 424 about a second side of the group of articles B1, B2, B3, B4. The arrangement of said plurality of fold lines 438a, 438b, 472b, 473c, 473d is substantially similar to that described above in relation to the first side panel 416 and will not be described in further detail.

[0218] A second outer blank 411 shown in Figure 17 comprises a series of main panels which form the main walls of a first inner carrier 490 once the second outer blank 411 is assembled. The series of main panels includes: a first bottom panel 425, a first side panel 423, a top panel 419, a second side panel 415 and a second bottom panel 413. The main panels 425, 423 are hinged one to the next by fold line 437. The main panels 415, 413 are hinged one to the next by fold line 427.

[0219] The first side panel 423 is coupled to the top panel 419 by a plurality of fold lines 483a, 483b, 433a, 433b. The top panel 419 is coupled to the second side panel 415 by a plurality of fold lines 431a, 431b, 483c, 483d.

[0220] To facilitate the mechanical interlocking of the first and second bottom panels 425, 413, the first and second bottom panels 425, 413 are provided with complementary locking means. Optionally, the illustrated complementary locking arrangement comprises a female tab F43 in the first bottom panel 425; and a male locking tab M43 in the second bottom panel 413.

[0221] Optional alignment apertures A47, A48 are provided in the first bottom panel 425. Optional alignment apertures A44, A46 are provided in the second bottom panel 413. The alignment apertures A47, A48, A44, A46 facilitate the automated location of the second bottom panel 413 relative to the first bottom panel 425.

[0222] Optionally, the alignment apertures A47, A48, A44, A46 are substantially triangular in shape, although other shapes may be employed.

[0223] The top panel 319 comprises one or more article

receiving apertures 402e, 402f, 402g, 402h. Each article receiving aperture 402e, 402f, 402g, 402h is configured to receive a neck portion of a respective one of the articles B1, B2, B3, B4. Each of the article receiving apertures 402e, 402f, 402g, 402h in the top panel 419 is configured to be disposed in vertical registry with a respective one of the article receiving apertures 402a, 402b, 402c, 402d in the top panel 420 of the first inner carrier 492.

[0224] The illustrated embodiment comprises four article receiving apertures 402e, 402f, 402g, 402h, in alternative embodiments a single or other plurality of article receiving apertures may be provided.

[0225] The first side panel 423 comprises a plurality of fold lines which facilitate folding the first side panel 423 about a third side of the group of articles B1, B2, B3, B4.

[0226] A first fold line 482a may be provided; the first fold line 482a extends substantially between, that is to say more than 50 percent of the height of the first side panel 425, the first bottom panel 425 and the top panel 419. The first fold line 482a bisects the first side panel 423.

[0227] The first fold line 482a may be collinear with a fold line 486 which extends across and bisects the top panel 419.

[0228] A second fold line 433a may be provided; the second fold line 433a extends from a first side edge of the first side panel 423 to the center of the first side panel 423 and intersects with the first fold line 482a.

[0229] A third fold line 433b may be provided; the third fold line 433b extends from a second side edge of the first side panel 423 to the center of the first side panel 423 so as to meet or intersect with the second fold line 433a and the first fold line 482a.

[0230] A fourth fold line 483a extends from a first side edge of the first side panel 423 to the vertex defined by the intersection of the first, second and third fold lines 482a, 433a, 433b. The fourth fold line 483a together with the second fold line 433a defines at least in part a first web panel which may be substantially triangular in shape.

[0231] A fifth fold line 483b extends from a second side edge of the first side panel 423 to the vertex defined by the intersection of the first, second and third fold lines 482a, 433a, 433b. The fifth fold line 483b together with the third fold line 433b defines at least in part a second web panel which may be substantially triangular in shape.

[0232] The second side panel 415 comprises a plurality of fold lines 431a, 431b, 482b, 483c, 483d which facilitate folding the second side wall 415 about a second side of the group of articles B1, B2, B3, B4. The arrangement of said plurality of fold lines 431a, 431b, 482b, 483c, 483d is substantially similar to that described above in relation to the first side panel 423 and will not be described in further detail.

[0233] Referring now to Figure 19 the first inner blank 410 and second outer blank 411 form a package 494. Figure 19 illustrates the second side panel 424 of the first inner carrier 492 and the first side panel 423 of the second outer carrier 490.

[0234] An upper portion of the second side panel 424 of the first inner carrier 492 is folded or deformed about shoulders of the articles B1, B4. The second side panel 424 is folded about fold line 472b so as to be displaced into a void between the articles B1, B4, so as to form a recessed panel portion. The recessed panel portion forms a valley trough which extends substantially vertically between the top panel 420 and the composite bottom panel 412/428.

[0235] The first and second web panels may be deformed about a respective one of the articles B1, B4 so as to form a close fit therewith.

[0236] The first and second web panels may be bent about the shoulder of the respective one of the articles B1, B4 such that the first and second web panels are non-coplanar with the remainder of the second side panel 424.

[0237] An upper portion of the first side panel 423 of the second outer carrier 490 is folded or deformed about shoulders of the articles B4, B3. The first side panel 423 is displaced inwardly into a void between the articles B4, B3, so as to form a recessed panel portion. The recessed panel portion forms a valley trough which extends substantially vertically between the top panel 419 and the composite bottom panel 425/413.

[0238] The first and second web panels of the first side panel 423 may be deformed about a respective one of the articles B4, B3 so as to form a close fit therewith.

[0239] The first and second web panels of the first side panel 423 may be bent about the shoulder of the respective one of the articles B4, B3 such that the first and second web panels are non-coplanar with the remainder of the first side panel 423.

[0240] Referring now to Figures 20, 21, 22 and 23, there are shown further embodiments of the present invention, including a first inner wraparound blank 510 for use with a second outer wraparound blank 511, which form a package 594 according to a sixth embodiment. In the sixth illustrated embodiment like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "500" to indicate that these features belong to the sixth embodiment. The embodiment shown in Figures 20 to 23 shares many common features with the earlier described embodiments and therefore only the differences from the embodiment illustrated in Figures 1 to 19 will be described in any greater detail.

[0241] Referring now to Figure 20, the first inner blank 510 again comprises a series of main panels which form the main walls of a first inner carrier 590 shown in Figure 22. The series of main panels include: a first bottom panel 512, a first bevel panel 514, a first side panel 516, a second bevel panel 518, a top panel 520, a third bevel panel 522, a second side panel 524, a fourth bevel panel 526 and a second bottom panel 528. The main panels 512, 514, 516, 518, 520, 522, 524, 526, 528 are hinged one to the next in series along fold lines 530, 532, 534, 536, 538, 580, 582 and 584.

[0242] The first inner blank 510 optionally does not comprise any end panels, or displaceable flaps or keel structure. Similarly to the first inner blank 10 of Figure 1, the first inner blank 510 does comprise a mechanical interlocking means for the first and second bottom panels 512, 528. Optionally, the illustrated complementary locking arrangement comprises two female tabs F51, F52 in the second bottom panel 528; and two male locking tabs M51, M52 in the first bottom panel 512.

[0243] The first inner blank 510 also optionally comprises alignment apertures A51, A53; and optional article heel engaging features H51, H52, H53, H54 which operate in the same manner as heel engaging features H1, H2, H3, H4 of blank 10. In this arrangement, the pair of recesses R1, R2 is replaced with a locking aperture A55 which is formed in the first bottom panel 512 and is provided to facilitate the co-operation and locking together of the inner wraparound carrier 590 and the outer wraparound carrier 592.

[0244] The second locking aperture A55 optionally has a generally hexagonal shaped edge and may comprise two opposed fold lines 509a, 509b and two opposed tabs 507a, 507b. The two opposed tabs 507a, 507b may be hinged about the fold lines 509a, 509b. The two opposed tabs 507a, 507b may be displaced by one or more locking tabs M53, M54 of a second outer carrier 592. The presence of the two displaced opposed tabs 507a, 507b in the locking arrangement may enhance the security with which the first carrier 590 is interlocked with the second carrier 592.

[0245] In the second bottom panel 528 a further locking aperture A52 is provided, which will overlap or be aligned with the locking aperture A55 of the first bottom panel 512 and the locking tabs 507a, 507b may assist in locking the first and second bottom panels 512, 528 to one another.

[0246] The second and third bevel panels 518, 522 optionally comprise a weakened arrangement 570a, 570b, 570c, 570d adjacent to each endmost aperture 502a, 502b, 502e, 502f. Since the weakened arrangements 570a, 570b, 570c, 570d are optionally similar, only one is described. Aperture 502e is defined in part by a circular cut line that lies adjacent to fold line 538. Adjacent to the aperture 502e a slit 570c extends at an angle in the third bevel panel 522. The weakened arrangements 570a, 570b, 570c, 570d can be broken to assist in removal of an article B from the carrier 590 when assembled.

[0247] The top panel 520, as shown in Figure 20, also comprises an article receiving arrangement, but in contrast to the embodiment of Figures 1 to 5, the article receiving arrangement does not comprise displaceable flaps. In this arrangement six apertures 502a, 502b, 502c, 502d, 502e, 502f are provided in the top panel 520, each one for receiving a top and neck portion of an article B1, B2, B3, B4, B5, B6. The article receiving arrangement also optionally comprises a series of frangible lines 504a, 504b, 504c, 504d, 506a, 506b, 506c, 506d that emanate radially outward from an edge of an aperture 502a, 502b,

502c, 502d, 502e, 502f as shown in Figure 20. The frangible lines 504a, 504b, 504c, 504d, 506a, 506b, 506c, 506d are sized, shaped, positioned and otherwise arranged to facilitate the withdrawal of an article by pulling it upwardly and causing a tear to propagate along one or more of the frangible lines 504a, 504b, 504c, 504d, 506a, 506b, 506c, 506d such that the aperture 502a, 502b, 502c, 502d, 502e, 502f associated with the article being removed is increased in size to allow the shoulder of that bottle to be lifted through the opening thereby created.

[0248] To preserve the integrity of the top panel 520, at least to some extent after one or more articles have been so removed, the article receiving arrangement may also comprise one or more terminations or edge cuts E1, E2, E3, E4, which terminations are optionally provided at the end of one, some or all of the frangible lines 504a, 504b, 504c, 504d, 506a, 506b, 506c, 506d in order to limit the extent to which a tear may propagate along the top panel 520.

[0249] The illustrated article receiving arrangement may differ in some embodiments to accommodate articles of different size, shape, number, and/or arrangement and/or the illustrated article receiving arrangement may differ in terms of the frangible lines and terminations provided which control the manner in which, and the ease with which, an article can be pulled free of the carrier 590.

[0250] The first inner wraparound carrier 590 of the present embodiment (see Figure 22) is assembled by first placing the top panel 520 over the tops of a group of six articles arranged in a 3 x 2 group, such that a neck of one article from the group is received in each of the apertures 502a, 502b, 502c, 502d, 502e, 502f. Construction of the carrier 590 is completed as described in respect of earlier embodiments with the second and third bevel panels 518, 522 and the first and second side panels 516, 524 being disposed alongside one of the sides B1/B4, B3/B6 of the article group. The first bottom panel 512 and first bevel panel 514 are then folded until the first and second article heel engaging features H51, H52 are located about the heels of the two articles B3, B6 on one side of the group and then the second bottom panel 528 and fourth bevel panel 526 are folded until the third and fourth heel engaging features H53, H54 are located about the heels of the two articles B1, B4 on the other side of the article group. Then, to form a bottom wall structure, the first and second bottom panels 512, 528 are mechanically locked together by punching the first and second male tabs M51, M52 against the first and second female tabs F51, F52.

[0251] The locking apertures A54 and A55 overlap and together with locking aperture A52, the inner carrier bottom wall is ready for interlocking with the outer carrier 592 by locking tabs from the outer wraparound carrier 592 being inserted into the locking apertures A54/A55, A52.

[0252] The outer wraparound carrier 592 compatible with the inner wraparound carrier 590 may take many and various forms. For example, the blank 511 shown in

Figure 21 may be assembled into one such suitable outer wraparound carrier 592, it being recognised that the illustrative example provided does not limit to a particular or specific combination of inner wraparound carrier and outer wraparound carrier.

[0253] In Figure 21 it can be seen that the blank 511 is similar to the blank 11 of Figure 2, but instead has differently shaped first and second bevel panels 521, 517 which give the overall carton an asymmetric appearance. Each first and second bevel panel 521, 517 has a skewed shape defined by slanted side edges. In contrast to the blank 11 of Figure 2, the blank 511 of Figure 21 additionally comprises first and second inset panels 527a, 527b that are foldably connected to an edge of the first and second side panels 523, 515 respectively via fold lines 539a, 539b.

[0254] To allow the inset panels 527a, 527b to fold freely, the first and second bottom panels 525, 513 are disconnected from the inset panels 527a, 527b.

[0255] A further difference between the blank 511 of Figure 21 and the blank 11 of Figure 2 is in the provision of shaped "female" locking tabs F53, F54 which in this arrangement have a greater width than the rectangular female tabs of blank 11. The locking tabs F53, F54 have shoulders and a leading edge that is narrower in width than the width of the locking tabs across their shoulders.

[0256] Yet a further difference between the blank 511 and blank 11 is that the carrying handle features are formed within and are surrounded by part of the top panel 519 rather than being formed in a recessed region at an edge of the top panel 519. Fully surrounded by the remainder of the top panel, each carrying handle feature comprises a first tab 553a hinged to a Y-shaped centre tab 555a along a shaped fold line 561a and a second tab 559a hinged on the other side of the Y-shaped centre tab 555a by a shaped fold line 563a (see Figures 21 and 23).

[0257] As before, in use the center tab 555a can be displaced out of the plane of the top panel 519 as it hinges downwardly about fold line 565a. The first and second tabs 553a, 559a are also displaced out of the plane of the top panel 519 and fold downwardly relative to the top panel 519 and slightly inwardly toward the center tab 555a. To carry the second outer wraparound carrier 592 (once assembled) a user can grip the top panel 519 using a pinching action, pressing their thumb against the center tab 555a of one side of the carrying feature and by pressing any one or more or all of their index, middle and ring fingers against the other center tab 555b and adjacent first and second tabs 553b, 559b.

[0258] Otherwise, the blank 511 comprises a similar series of main panels including: a first bottom panel 525, a first side panel 523, a first bevel panel 521, a top panel 519, a second bevel panel 517, a second side panel 515, and a second bottom panel 513.

[0259] Turning to the construction of the package 594 as illustrated in Fig. 22, the second outer wraparound carrier 592 is aligned with the articles within the first inner

carrier 590, lowered and placed onto the tops of the articles B1 - B6. The first and second bevel panels 521, 517 are folded about fold lines 533 and 531 respectively and the first and second side panels 523, 515 are then folded about fold lines 535 and 529 until the first and second side panels 523, 515 are each disposed alongside an end B1/B2/B3 of the article group. As the first and second bevel panels 521, 517 are folded, the article top engaging features T1, T2 are tightly fitted around the tops of the centre-most articles B2, B5 of the group. In this way, the second outer carrier 592 comprises an article engaging structure T1, T2 and a top portion C of at least one of the articles B2, B5 of the group in the first inner carrier 590 is received, at least in part, within the top article engaging structure T1, T2 of the second outer tubular structure 592.

[0260] The first and second inset panels 527a, 527b are folded inwardly towards the article group.

[0261] The second bottom panel 513 is disposed beneath part of the bottom wall structure 512/528 of the inner wraparound carrier 590. In this way, the locking tabs F53, F54 are aligned with and disposed beneath the locking apertures A52, A54/A55. The first bottom panel 525 is then folded about fold line 537 until the first bottom panel 525 is disposed beneath part of the second bottom panel 513 and part of the bottom wall structure 512/528 of the inner wraparound carrier 590. The male locking tabs M53, M54 are thereby disposed beneath both the female locking tabs F53, F54 and the locking apertures A52, A54/A55. The first and second male tabs M53, M54 are then pushed against the female tabs F53, F54 respectively. This displaces the female tabs F53, F54 into and through a respective one of the locking apertures and allows the male tabs to also be pushed into a respective one of the locking apertures F53, F54. In respect of the locking aperture A54/A55, this action also inwardly displaces the locking tabs 507a, 507b to form a secure interlocking of both the first and second bottom panels 512, 528 with one another and a secure interlocking of the first and second bottom panels 525, 513 of the outer carrier 592 with the first and second bottom panels 512/528 of the inner carrier 590.

[0262] Once the shoulders of both the first and second male tabs M53, M54 and of the first and second "female" tabs F53, F54 are pushed past the outer bottom wall structure 513/525 and through and into the interior region of the first inner wraparound carrier 590, return of the male and female tabs M53, M54, F53, F54 is prevented and the inner wraparound carrier 590 and outer wraparound carrier 592 are securely locked together, with the ends of the article group B1/B2/B3, B4/B5/B6 now being more fully (albeit still partially) covered by the first and second side and bevel panels 523/521, 517/515 of the second outer wraparound carrier 592.

[0263] The package 594 thus formed comprises a first inner carrier 590, a second outer carrier 592 and may be easily carried by the carrying features 553a/555a/559a and 553b/555b/559b, which as shown in Figure 23 pro-

vide a carrying handle structure and individually provide a spacer between adjacent centremost articles B2, B5 of the article group.

[0264] Referring now to Figures 24, 25 and 26, there is shown a further embodiment of the present invention, including a first inner wraparound blank 610 for use with a second outer wraparound blank 611, which form a package 694 according to a seventh embodiment. In the seventh illustrated embodiment, like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "600" to indicate that these features belong to the sixth embodiment. The inner wrap-around blank 610 and the inner wraparound carrier 692 share many features in common with the embodiment shown in Figures 20 to 23; and the outer wraparound blank 611 and the outer wraparound carrier 690 share many features in common with the embodiment shown in Figures 2 and 21 and therefore only the differences from the earlier described embodiments will be described in any greater detail.

[0265] Referring now to Figure 24, the first inner blank 610 is configured for holding four articles in a 2 x 2 arrangement and again comprises a series of main panels which form the main walls, which although does not comprise first and fourth bevel panels, does include: a first bottom panel 612, a first side panel 616, a second bevel panel 618, a top panel 620, a third bevel panel 622, a second side panel 624, and a second bottom panel 628.

[0266] Similarly to the first inner blank 510, the first inner blank 610 optionally does not comprise any end panels, or displaceable flaps or keel structure and further similarly to the first inner blank 510 of Figure 20, the first inner blank 610 comprises a mechanical interlocking means for the first and second bottom panels 612, 628. Optionally, the illustrated complementary locking arrangement comprises two female tabs F61, F62 which are optionally generally rectangular in shape in the second bottom panel 628; and two male locking tabs M61, M62 in the first bottom panel 628.

[0267] In this arrangement, a second locking aperture A65 is again formed in the first bottom panel; and as with the blank 510 of Figure 20, the second locking aperture A65 has a generally hexagonal shaped edge and may comprise two opposed fold lines 609a, 609b and two opposed, hinged tabs 607a, 607a. The two opposed tabs 607a, 607b may be hinged about the fold lines 609a, 609b. The two opposed tabs 607a, 607a may be displaced by a locking tab M63, M64 of a second outer carrier 690. The presence of the two displaced opposed tabs 607a, 607b in the locking arrangement may enhance the security with which the first carrier 692 is interlocked with the second carrier 690.

[0268] In the second bottom panel 628 a further locking aperture A64 is provided, which may overlap or be aligned with the locking aperture A65 of the first bottom panel 612 and the locking tabs 607a, 607b may assist in locking the first and second bottom panels 612, 628 to one another and/or to the outer carrier 692.

[0269] In this arrangement, the blank 610 optionally comprises additional apertures A32, A34 formed such that an edge of the aperture A32, A34 is coincident with the fold line 632, 684 between the first or second bottom panel 612, 628 and the adjacent first or second side panel 616, 624. The apertures A32, A34 may be used as alignment apertures for use during construction of the carrier 692, to ensure, for example, that the first and second bottom panels 612, 628 are properly aligned. The apertures A32, A34 may also receive interlocking features of the outer carrier 690.

[0270] The top panel 620, as shown in Figure 24 comprises an article receiving arrangement, but in contrast to the embodiment of Figures 1 to 5, the article receiving arrangement does not comprise displaceable flaps. In this arrangement four apertures 602a, 602b, 602c and 602d are provided in the top panel 620, each one for receiving a top and neck portion of an article B1, B2, B3, B4. The article receiving arrangement also optionally comprises a series of four frangible lines 604a, 604b, 604c, 604d that each emanate radially outward from an edge of an aperture 602a, 602b, 602c and 602d as shown in Figure 24. The frangible lines 604a, 604b, 604c, 604d, are sized, shaped, positioned and otherwise arranged to facilitate the withdrawal of an article by pulling it upwardly and causing a tear to propagate in the top panel 620 such that the aperture 602a, 602b, 602c, 602d associated with the article being removed is increased in size to allow the shoulder of that bottle to be lifted through the opening thereby created.

[0271] As before, the second and third bevel panels 618, 622 optionally comprise a weakened arrangement 668a, 668b, 670a, 670b adjacent to each of the four article receiving apertures 602a, 602b, 602c, 602d that are provided in the top panel 620. Since the weakened arrangements 668a, 668b, 670a, 670b are optionally similar, only one is described. Adjacent to the aperture 602a the frangible line 604a extends at an angle toward the first bevel panel 618; and toward a slit 668b formed at a co-operative angle in the first bevel panel 618. The slit 668b and frangible line 604a can be broken and used to tear the top panel 620 and the first bevel panel 618 to assist in removal of an article B from the carrier 692 when assembled.

[0272] The first inner wraparound carrier 692 of the present embodiment (see Figure 22) is assembled by first placing the top panel 690 over the tops of a group of four articles arranged in a 2 x 2 group, such that a neck of one article from the group is received in each of the apertures 602a, 602b, 602c, 602d. Construction of the carrier 692 is completed as described in respect of earlier embodiments with the second and third bevel panels 618, 622 and the first and second side panels 616, 624 being disposed alongside one of the sides B1/B2, B3/B4 of the article group. The first bottom panel 612 is then folded until the first and second article heel engaging features H61, H62 are located about the heels of the two articles B1, B2 on one side of the group and then the second

bottom panel 628 is folded until the third and fourth heel engaging features H63, H64 are located about the heels of the two articles B3, B4 on the other side of the article group. Then, to form a bottom wall structure, the first and second bottom panels 612, 628 are mechanically locked together by punching or pressing the first and second male tabs M61, M62 against the first and second female tabs F61, F62.

[0273] The locking apertures A64 and A65 may overlap and prepare the inner carrier bottom wall for interlocking with the outer carrier 690 using a locking tab (M63 or M64) from the outer wraparound carrier 690.

[0274] The outer wraparound carrier 690 compatible with the inner wraparound carrier 692 may take many and various forms. In this arrangement, two inner carriers 692a, 692b are held by a single outer carrier 690, such that the overall package 694 contains 8 articles B1, B2, B3, B4, B1', B2', B3', B4' packaged into two separate carriers 692a, 692b, each comprising a 2 x 2 group of four articles. An example, of a carrier 690 suitable for combination with two inner carriers 692a, 692b is shown in Figure 26. The carrier 690 is formed from a blank 611 as shown in Figure 25. It will be recognised that the illustrative example provided does not limit to a particular or specific combination of inner wraparound carrier and outer wraparound carrier.

[0275] In Figure 25 it can be seen that the blank 611 is similar to the blank 11 of Figure 2, albeit, with larger sized panels to accommodate a greater number of articles B1, B2, B3, B4, B1', B2', B3', B4'. Additionally, the top panel 619 is formed similarly to the top panel 520 of the blank shown in Figure 21 wherein the carrying handle features are formed within and are surrounded by part of the top panel 619 rather than being formed in a recessed region at an edge of the top panel 619. Fully surrounded by the remainder of the top panel, each carrying handle feature again comprises a first tab hinged to a Y-shaped centre tab 655a along a shaped fold line and a second tab hinged on the other side of the Y-shaped centre tab 655a by a shaped fold line (see Figures 25 and 26).

[0276] As before, in use the center tab 655a can be displaced out of the plane of the top panel 619 as it hinges downwardly. The first and second tabs are also displaced out of the plane of the top panel 619 and fold downwardly relative to the top panel 619 and slightly inwardly toward the center tab 655a. To carry the second outer wraparound carrier 690 (once assembled) a user can grip the top panel 619 using a pinching action, pressing their thumb against the center tab 655a of one side of the carrying feature and by pressing any one or more or all of their index, middle and ring fingers against the other center tab 655b and adjacent first and second tabs.

[0277] Otherwise, the blank 611 comprises a similar series of main panels to the blank 11 of Figure 2, including: a first bottom panel 625, a first side panel 623, a first bevel panel 621, the top panel 619, a second bevel panel 617, a second side panel 615, and a second bottom panel

613.

[0278] To interlock the outer carrier 690 formed from the blank 611 to the two inner carriers 692a, 692b, the first and second bottom panels 625, 613 are provided with shaped and wide locking tabs M63, M64, F63, F64 that co-operate as described above. In addition, the first bottom panels comprise one or more optional male tabs M65, M66 which co-operate with one or more corresponding female tabs F65, F66. This locking mechanism is provided to interlock the first and second bottom panels 625, 613 of the outer carrier 690 together and increases the security with which the bottom structure of the package 694 is held together. As can be seen the additional bottom locking features M65, M66, F65, F66 that interlock the first bottom panel 625 of the outer carrier 690 to the second bottom panel 613 of the outer carrier 690 to one another, are optionally provided in a central region of the blank 611. This may offer increased strength in the region where the two separate inner carriers 692a, 692b meet.

[0279] An optional series of alignment apertures A61, A62, A63, A54; A55, A66, A67, A68 are provided in the first and second bottom panels 625, 613, again for aiding the correct alignment of the first and second bottom panels 625, 613 with one another for interlocking the outer carrier 690 together and with the bottom walls 612/628, 612'/628' of the inner carriers 692a, 692b.

[0280] The package 694 formed from two inner carriers 692a, 692b and the single outer carrier 690 is shown in Figure 26. The package 694 is constructed by positioning two inner carriers 692a, 692b next to one another such that the second side panel 624 of a first one of the inner carriers 692a is disposed next to and possibly in face contacting relationship with a first side panel 616' of the second one of the inner carriers 692b. This results in a 2x4 article array being formed.

[0281] The top panel 619 is then placed over the top of the eight bottle group B1, B2, B3, B4; B1', B2', B3', B4' and the first and second bevel panels 621, 617 folded down against the "open ends" of the inner carriers 692a, 692b. The first bevel panel 621 is disposed alongside a first end B2, B4, B2', B4' of the article group; and the second bevel panel 617 is disposed alongside a second end B1, B3, B1', B3' of the article group. The top engaging features T1a, T1b mate and locate with centremost articles B4, B2'; and the top engaging features T2a, T2b mate and locate with centremost articles B3, B1'.

[0282] After folding the first and second side panels firmly against the ends of the inner carriers 692a, 692b, the first and second bottom panels 625, 613 of the outer carrier are folded in turn, beneath the inner carriers 692a, 692b. The second bottom panel 613 is folded first and contacts the underside of the bottom wall structures of the inner carriers 692a, 692b such that the female locking tab F64 is disposed beneath locking aperture A64/A65 of the first inner carrier 692a; and such that the female locking tab F63 is disposed beneath the locking aperture A64'/A65' of the second inner carrier 692b.

[0283] The first bottom panel 625 is then folded such that it contacts the underside of the bottom wall structures of the inner carriers 692a, 692b; and partially overlays the second bottom panel 613. In this way, the male locking tab M64 is aligned with and disposed beneath the female locking tab F64 and locking aperture A64/A65 of the first inner carrier 692a; the male locking tab M63 is aligned with and disposed beneath the female locking tab F63 and locking aperture A64', A65' of the second inner carrier 692b; and the additional male locking tabs M65, M66 are disposed beneath and aligned with the female tabs F66, F65 and apertures A32, A34.

[0284] To interlock the first and second bottom panels 625, 613 to one another; and to interlock the bottom wall 625/613 of the outer carrier 690 to the inner carrier 692a: the male tab M64 is forced against the female tab F64, which pushes both the female tab F64 and the male tab M64 upwardly into the locking aperture A64/A65, which in turn pushes the tabs 607a, 607b up into the interior of the first inner carrier 692a. The tabs 607a, 607b are disposed behind the female tab F64 and male tab M64 respectively and the shape and size of all tabs M64, F64, 607a, 607b are such that once punched upwardly into a locking position, return of the tabs to their starting position is very difficult indeed. In this way the outer carrier 690 is securely attached to the inner carrier 692a. The male and female tabs M64, F64 may abut the edge of the aperture A65/A64 which may be shaped such that the shoulders of the male tab M64 overhang the edge of the aperture A65/A64 and sit on or just above the inner surface of the second bottom panel 628 of the first inner carrier 692a.

[0285] This is shown in Figure 27, which illustrates an internal view of part of the package with bottles removed. The first inner carrier 692a is shown with its first side panel 616 to the right-hand side of the picture. The heel locking features H62, H61, with their foldable retention tabs 644a folded, can be seen. Similarly, on the left-hand side of the picture, the second side panel 624 can be seen, with its heel locking features H63, H64 shown. Through the gaps created by the inward folding of the foldable retention tabs 644a, the second inner carrier 692b can be seen, in particular the first side panel 616' thereof (on the very left-hand side of the picture). As can be seen the second bottom panel 628 of the inner carrier 692a sits partially on top of the first bottom panel 612.

[0286] Similarly, to further interlock the first and second bottom panels 625, 613 to one another; and to interlock the bottom wall 625/613 of the outer carrier 690 to the inner carrier 692b: the male tab M63 is forced against the female tab F63, which pushes both the female tab F63 and the male tab M63 upwardly into the locking aperture A64'/A65', which in turn pushes the tabs 607a', 607b' up into the interior of the second inner carrier 692b. The tabs 607a', 607b' are disposed behind the female tab F63 and male tab M63 and the shape and size of all tabs M63, F63, 607a', 607b' are such that once punched upwardly into a locking position, return of the tabs to their

starting position is very difficult indeed. In this way the outer carrier 690 is securely attached to the second inner carrier 692b. The male and female tabs M63, F63 may abut the edge of the aperture A65'/A64' which may be shaped such that the shoulders of the male tab M63 overhang the edge of the aperture A65'/A64' and sit on or just above the inner surface of the second bottom panel 628' of the second inner carrier 692b.

[0287] Furthermore, to interlock the first and second bottom panels 625, 613 to one another, male tabs M66, M65 are forced against female tabs F66, F65. The male and female tabs may be located in the apertures A34, A32' respectively and may therefore provide additional interlocking of the inner and outer carriers 692a, 692b, 690.

[0288] To remove an article, the weakened arrangement 668a, 668b, 670a, 670b adjacent to each of the four article receiving apertures 602a, 602b, 602c, 602d can be broken; and even once one or more of the articles have been removed, the structural integrity of the package 694 remains.

[0289] Referring now to Figures 28 to 29, there is shown a further alternative embodiment of the present disclosure wherein an inner blank 710 may be combined with a second outer blank for example the blank 611 of Figure 25 in order to construct a package 794. In the eighth illustrated embodiment, like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "700" to indicate that these features belong to the eighth embodiment. The alternative embodiment shares many common features with the previous embodiments and therefore only the differences from the embodiments illustrated in Figures 1 to 27 will be described in any greater detail.

[0290] The first inner blank 710 comprises a series of main panels which form the main walls of a first inner carrier 792 once the first inner blank 710 is assembled. The series of main panels include: a first bottom panel 712, a first side panel 716, a top panel 720, a second side panel 724, and a second bottom panel 728. The main panels 712, 716, are hinged one to the next by fold line 732. The main panels 724, 728, are hinged one to the next by fold line 784.

[0291] A first end panel 750 is coupled to the top panel 720 by fold lines 760a. A second end panel 152 is coupled to the top panel 720 by a fold line 760b. The blank 710 is configured to automatically articulate the first and second end panels 750, 752 into a set-up position when the blank 710 is assembled. The blank comprises four anchor panels 754a, 754b, 754c, 754d and four web panels 756a, 756b, 756c, 756d and four gusset panels 764a, 764b, 764c, 764d.

[0292] A first anchor panel 754a is hingedly connected to a first side of the first side panel 716 by a fold line 753a. The first anchor panel 754a is hingedly connected, along an end thereof, to a first gusset panel 764a by a fold line 758a. The first gusset panel 764a is hingedly connected to a first web panel 756a by a fold line 763a. The first

web panel 756a is hingedly connected to the first end panel 750 by a fold line 757a.

[0293] A second anchor panel 754b is hingedly connected to a second side of the first side panel 716 by a fold line 753b. The second anchor panel 754b is hingedly connected, along an end thereof, to a second gusset panel 764b by a fold line 758b. The second gusset panel 764b is hingedly connected to a second web panel 756b by a fold line 763b. The second web panel 756b is hingedly connected to the second end panel 752 by a fold line 757b.

[0294] A third anchor panel 754c is hingedly connected to a first side of the second side panel 724 by a fold line 753c. The third anchor panel 754c is hingedly connected, along an end thereof, to a third gusset panel 764c by a fold line 758c. The third gusset panel 764c is hingedly connected to a third web panel 756c by a fold line 763c. The third web panel 756c is hingedly connected to the first end panel 750 by a fold line 757c.

[0295] A fourth anchor panel 754d is hingedly connected to a second side of the second side panel 724 by a fold line 753d. The fourth anchor panel 754d is hingedly connected, along an end thereof, to a fourth gusset panel 764d by a fold line 758d. The fourth gusset panel 764d is hingedly connected to a fourth web panel 756d by a fold line 763d. The fourth web panel 756d is hingedly connected to the second end panel 752 by a fold line 757d.

[0296] To facilitate the mechanical interlocking of the first and second bottom panels 712, 728, the first and second bottom panels 712, 728 are provided with complementary locking means. Optionally, the illustrated complementary locking arrangement comprises two female tabs F71, F72 in the second bottom panel 728; and two male locking tabs M11, M12 in the first bottom panel 712.

[0297] Optional alignment aperture A71 is provided in the second bottom panel 728 for facilitating the automated location of the second bottom panel 728 relative to the first bottom panel 712. Optional alignment aperture A72 is provided in the first bottom panel 712 for facilitating the automated location of the second bottom panel 728 relative to the first bottom panel 712. Apertures A71 and A72 may also receive locking tabs of an outer carrier, such as outer carrier 690.

[0298] Optional article heel engaging features H71, H72, H73, H74 are also provided and have a similar structure to the heel engaging features H1, H2, H3, H4 already described, albeit with the addition of an aperture which separates in part the one of the pair of inwardly foldable retention tabs from the other of the pair of inwardly foldable retention tabs, and the inclusion of an additional fold line in each of the retention tabs, the additional fold line defining in part a substantially triangular web portion.

[0299] To facilitate the co-operation and locking together of the inner wraparound carrier 792 formed from the blank 710 (see Figure 29) with an outer wraparound carrier, a mechanical interlocking mechanism is provided.

The mechanical interlocking mechanism optionally comprises one or more apertures provided on the inner wraparound carrier 792 for co-operating with locking tabs provided in the outer wraparound carrier. In the present embodiment, the blank 710 is optionally provided with a first locking aperture A74 struck from the second bottom panel 728 and second locking aperture A75 struck from the first bottom panel 712. Optionally, the locking apertures A74, A75 have a substantially hexagonal shape. The first and second apertures A74, A75 are each sized and positioned for receiving a locking tab from the outer wraparound carrier. The first and second apertures A74, A75 are configured so as to be disposed in vertical registry when the carrier 792 is assembled.

[0300] The second locking aperture A75 is defined in part by one or more tabs 709a, 709b, hingedly connected to the first bottom panel 712 by fold line 707a, 707b respectively. The illustrated embodiment comprises a pair of oppositely disposed tabs 709a, 709b. The tabs 709a, 709b are folded inwardly of the carrier 792, the first bottom panel 712 being disposed externally of the second bottom panel 728, so as to pass through the first locking aperture A74 thereby holding the first and second bottom panel 712, 728 in position while the second outer carrier is assembled thereabouts.

[0301] The top panel 120 comprises an article receiving arrangement. The article receiving arrangement comprises a pair of transversely arranged displaceable flaps 720b, 720c, that extend between portions of the top panel 720 hingedly connected to the end panels 150, 152. The article receiving arrangement comprises a pair of elongate apertures or slots 720a, 720d that extend between the end panels 750, 752. A first aperture 720a defines an upper edge 766a of the first side panel 716. A second aperture 720d defines an upper edge 766b of the second side panel 724.

[0302] The pair of transversely arranged displaceable flaps 720b, 720c are hinged to each other by a fold line 762b. The fold line 762b terminates at each end with a "V" shaped portion.

[0303] A first leg 704a of a first "V" shaped portion hingedly connects a first end of a first displaceable flap 720b to the top panel 720. A second leg 704c of the first "V" shaped portion hingedly connects a first end of a second displaceable flap 720d to the top panel 720.

[0304] A first leg 704b of a second "V" shaped portion hingedly connects a second end of the first displaceable flap 720b to the top panel 720. A second leg 704d of the second "V" shaped portion hingedly connects a second end of the second displaceable flap 720c to the top panel 720.

[0305] The first displaceable flap 720a comprises one or more recesses 769a each shaped to receive a portion of respective article B1, B2, B3, B4. The illustrated embodiment comprises a pair of recesses 769a.

[0306] The second displaceable flap 720b comprises one or more recesses 769b each shaped to receive a portion of respective article B1, B2, B3, B4. The illustrated

embodiment comprises a pair of recesses 769b.

[0307] The first side panel 716 comprises a first fold line 770b which extends between an upper edge of the first side panel 716 and a first side edge; defined by fold line 753a, of the first side panel 716 so as to be obliquely disposed.

[0308] The first side panel 716 comprises a second fold line 768b which extends between an upper edge of the first side panel 716 and a second side edge; defined by fold line 753b, of the first side panel 716 so as to be obliquely disposed.

[0309] The second side panel 724 comprises a third fold line 770a which extends between an upper edge of the second side panel 724 and a first side edge; defined by fold line 753c, of the second side panel 724 so as to be obliquely disposed.

[0310] The second side panel 724 comprises a second fold line 768a which extends between an upper edge of the second side panel 724 and a second side edge; defined by fold line 753d, of the second side panel 724 so as to be obliquely disposed.

[0311] Optionally the first, second, third and fourth fold lines 770b, 768b, 770a, 768a may be comprised of two or more linear sections divergently arranged with respect to each other.

[0312] The construction of the first inner wraparound carrier 792 is similar to that already described in relation to the first inner wraparound carrier 92, albeit, when the top panel 120 is lowered and placed over the tops of the articles B1, B2, B3, B4, a pair of articles B1, B2, B3, B4 passes through each of the apertures 720a, 720d. This causes the displaceable flaps 720b, 720c to each fold upwardly about fold line 762b such that two transverse rows, each comprising two articles, are disposed within a transverse aperture thereby formed.

[0313] The first and second side panels 716, 724 are then folded about the group of articles until they are each disposed alongside a side of the article group. The anchor panels 754a, 754b, 754c, 754d are folded into face contacting relationship with the respective one of the first and second side panels 716, 724, as the first and second side panels 716, 724 are folded about the group of articles. Consequently, the first and second end panels 750, 752 are automatically erected about respective ends of the article group.

[0314] The first and second bottom panels 712, 728 are folded about the base of the article group. The heel engaging features H71, H72, H73, H74 each being located about a heel of an article along respective sides of the group of articles and with the first bottom panel 712 being disposed externally of, and in overlapping relationship with, the second bottom panel 728.

[0315] The mechanical interlocking mechanism M71, M72, F71, F72 can be operated to secure the first and second bottom panels 712, 728 together by displacing the male tabs M71, M72 inwardly to displace the female tabs F71, F72 and through the respective apertures in the second bottom panel 728 thereby formed.

[0316] In this way, the first and second bottom panels 712, 728 are mechanically locked together such that the group of articles B1, B2, B3, B4, are tightly packed and held together within the first carrier 792. The ends of the article group (see Figure 29) are covered only partially by the first and second end panels 750, 752 but are otherwise exposed.

[0317] A keel structure or bracing structure is formed by the combination of displaceable tabs 720b, 720c, fold line 762b and the fold lines 704a, 704c, 704b, 704d at either end thereof that couple the displaceable tabs 720b, 720c to the top panel 720. The keel structure forms a brace between a first row of articles B1/B4 and a second row of articles B2/B3.

[0318] The first, second, third and fourth fold lines 770a, 768a, 770b, 768b facilitate folding of upper end portions of the first and second side panels 716, 728 about the shoulder of an adjacently disposed article B1, B2, B3, B4. In this way the first carrier forms a close fit with the group of articles. The first, second, third and fourth fold lines 770a, 768a, 770b, 768b may facilitate folding of said portions of the first and second side panels 716, 728 at least partially over the shoulder of an article B1, B2, B3, B4 thereby increasing the retention of the articles therein. The constructed inner carrier 792 is shown in Fig. 29.

[0319] To complete a package (not shown) one or more, for example two such inner carriers 792 may be housed within and locked and attached to an outer carrier, for example the outer carrier 690 of the previous embodiment.

[0320] The following numbered paragraphs provide statements regarding the present disclosure.

[0321] A package comprising at least one first inner carrier and a second outer carrier, the or each of the at least one first inner carrier having a first tubular axis, the second outer carrier having a second tubular axis, and the second outer carrier being disposed, at least in part, on the outside of the first inner carrier such that the first and second tubular axes are substantially perpendicular.

[0322] A package according to paragraph [0001] further comprising a group of articles, wherein the or each at least one first inner carrier is of the wraparound type and comprises: a top panel, first and second side panels, a bottom wall and two opposite open ends, wherein the first tubular axis extends between the two opposite open ends; wherein the second outer carrier is of the wraparound type and comprises: a top panel, first and second side panels, a bottom wall and two opposite open ends, wherein the second tubular axis extends between the two opposite open ends; wherein the first inner carrier is wrapped about the group of articles, and wherein the second outer carrier is wrapped around the first inner carrier and group of articles.

[0323] A package according to paragraph [0002] wherein the first and second carriers comprise complementary features provided to facilitate co-operation of the first and second carriers.

[0324] A package according to paragraph [0001] or paragraph [0002] wherein the second outer carrier comprises at least one locking tab and wherein the first inner carrier comprises an aperture, the first and second carriers being configured such that when the package is formed, the locking tab of the second outer carrier is received in said aperture of the first inner carrier for connecting the first inner and second outer carriers together.

[0325] A package according to paragraph [0004] when dependent upon paragraph [0002], wherein the bottom wall of the first inner carrier is formed by a first bottom panel and a second bottom panel disposed in at least partial overlapping relationship, and wherein the aperture is defined in part by a first cutaway struck from the first bottom panel and a second cutaway struck from the second bottom panel.

[0326] A package according to any of paragraphs [0002] to [0004], wherein the second outer carrier comprises an article engaging structure, and wherein a top of at least one of the articles of the group in the first inner carrier is received, at least in part, within the engaging structure of the second outer tubular structure.

[0327] A package according to any of paragraphs [0001] to [0006], further comprising a carrying handle structure, which carrying handle structure comprises one or more foldable tabs, and wherein said one or more foldable tabs provide a spacer for being disposed between two adjacent articles.

[0328] A package comprising a first carton and two or more articles, the first carton comprising: a top panel, first and second side panels, a bottom wall, wherein the first carton is disposed about the group of articles, and wherein the carton is disposed about the two or more articles, wherein at least one of the first and second side panels comprises a fold line extending at least in part between the top panel and the bottom wall, the fold line arranged to be aligned with a void between a pair of adjacent articles and facilitating folding of said one of the first and second side panels into said void.

[0329] A package according to paragraph [0008] wherein the other one of the first and second side panels comprises a second fold line extending at least in part between the top panel and the bottom wall, the second fold line arranged to be aligned with a second void between a pair of adjacent articles and to facilitate folding of said other one of the first and second side panels into said second void.

[0330] A package according to paragraph [0008] comprising a second carton, the first carton having a first tubular axis, the second carton having a second tubular axis, and the second carton being disposed, at least in part, on the outside of the first carton such that the first and second tubular axes are substantially perpendicular.

[0331] A package according to paragraph [0009], the package comprising a group of articles arranged in two or more rows, each row comprising at least two articles and wherein the second carton comprises: a top panel, first and second side panels, a bottom wall, wherein the

at least one of the first and second side panels of the second carton comprises a third fold line extending at least in part between the top panel and the bottom wall, the fold line arranged to be aligned with a third void between an article in a first row and a further article in an adjacent row, the third fold line facilitating folding of said one of the first and second side panels of the second carton into said third void.

[0332] A package according to paragraph [0011] wherein the other one of the first and second side panels of the second carton comprises a fourth fold line extending at least in part between the top panel and the bottom wall, the fourth fold line arranged to be aligned with a fourth void between a pair of articles disposed in adjacent rows and to facilitate folding of said other one of the first and second side panels of the second carton into said fourth void.

[0333] A package according to paragraph [0008] wherein the articles are substantially cylindrical in shape, said void being defined at least in part by a recess between a portion of the cylindrical wall of each of a pair of adjacent articles, and wherein the fold line forms a valley fold, extending substantially vertically, the valley fold being received in the void so as to tighten the first carton about the two or more articles.

[0334] A package according to paragraph [0001] comprising at least two inner carriers and an outer carrier, each of the at least two inner carriers having a first tubular axis, and the second outer carrier being disposed, at least in part, on the outside of each of the at least two inner carriers such that the first tubular axes of each of the inner carriers are disposed substantially perpendicular to the second tubular axis of the second carrier.

[0335] A package according to paragraph [0001] the package comprising a group of articles arranged in two or more rows, each row comprising at least two articles and wherein the package of the second outer carrier is asymmetric, the second outer carrier being configured such that diagonally opposite articles in the group are exposed to view.

[0336] A package according to paragraph [0015] wherein at least a portion of the diagonally opposite articles are visible through a respective open end of the first inner carrier.

[0337] A package according to paragraph [0015] wherein the second outer carrier comprises: a top panel, first and second side panels, a bottom wall, and wherein the second outer carrier comprises a partition panel hinged to at least one of the first and second side panels, the partition panel being folded into a void between two adjacent articles, whereby exposing to view one of said two adjacent articles.

[0338] A package according to paragraph [0017] wherein the hinge partition panel is hinged to an end edge of the at least one of the first and second partition panels.

[0339] A package according to paragraph [0001] or paragraph [0002] wherein the bottom wall of the first inner carrier is formed by a first bottom panel and a second

bottom panel disposed in at least partial overlapping relationship, and wherein a second aperture is defined in the first bottom panel and a third aperture is defined in the second bottom panel, the second and third apertures being disposed in vertical registry with one another.

[0340] A package according to paragraph [0019] wherein the first bottom panel comprises at least one securing tab defining in part said second aperture and wherein the at least one securing tab is received in the third aperture whereby securing the first and second panel together.

[0341] A package according to paragraph [0019] and paragraph [0004] wherein the at least one locking tab provided by the second outer carrier is received in the second and third apertures provided by the first inner carrier.

[0342] A package according to paragraph [0001] wherein the or each at least one first inner carrier comprises a first tubular structure formed from a first top panel, first and second side panels, a first composite bottom wall formed from a first bottom panel disposed in at least partial overlapping relationship with a second bottom panel, and wherein the or each at least one second outer carrier comprises a first tubular structure formed from a second top panel, third and fourth side panels, a second composite bottom wall formed from a third bottom panel disposed in at least partial overlapping relationship with a fourth bottom panel, wherein one of the first and second bottom panels comprises a first alignment aperture for facilitating assembly of the first inner carrier about a group of articles, wherein one of the third and fourth bottom panels comprises an alignment aperture for facilitating assembly of the second outer carrier, the first alignment aperture configured to allow movement of a machine component in two directions during assembly of the package.

[0343] A package according to paragraph [0022] wherein the first alignment aperture is shaped to allow movement of a machine component in two substantially perpendicular directions during assembly of the package.

[0344] A package according to paragraph [0022] wherein the first alignment aperture is shaped such that a machine component is moveable in a first direction substantially perpendicular to the tubular axis of the first inner carrier so as to facilitate assembly of the first inner carrier and in a second direction substantially parallel with the tubular axis of the first inner carrier so as to facilitate assembly of the second outer carrier.

[0345] A package according to paragraph [0022] wherein the first alignment aperture is shaped to facilitate alignment of the third and fourth panels of the second outer carrier with respect to each other and to facilitate alignment of the third and fourth panels of the second outer carrier with respect to the first bottom panel of the first inner carrier.

[0346] A two part package comprising at least one first inner carrier and a second outer carrier, the first inner

carrier comprising:

a first tubular axis;
a top panel having at least one slot therein for receiving a portion of at least one article;
the second outer carrier comprising:

a second tubular axis;
wherein the second outer carrier is disposed, at least in part, about the at least one first inner carrier, the first and second tubular axes being arranged substantially perpendicular.

[0347] A package according to paragraph [0026] further comprising a group of articles, wherein the at least one first inner carrier is of the wraparound type and comprises: a top panel, first and second side panels, a bottom wall and two opposite open ends, wherein the first tubular axis extends between the two opposite open ends and defines a longitudinal direction; wherein the second outer carrier is of the wraparound type and comprises: a top panel, first and second side panels, a bottom wall and two opposite open ends, wherein the second tubular axis extends between the two opposite open ends; wherein the at least one first inner carrier is wrapped about the group of articles, and wherein the second outer carrier is wrapped around the at least one first inner carrier and group of articles.

[0348] A package according to paragraph [0027] wherein the bottom wall of the at least one first inner carrier is disposed in overlying relationship with the bottom wall of the second outer carrier.

[0349] A package according to paragraph [0027] wherein the top panel comprises a first slot for receiving a portion of at least one article in a first row of articles, and a second slot for receiving a portion of at least one article in a second row of articles, the top panel comprising a spacer keel disposed between the first and second rows of articles.

[0350] A package according to paragraph [0029] wherein the spacer keel comprises a first portion defining in part the first slot and a second portion defining in part the second slot, the first and second portion being arranged to form a valley trough or "V" shape.

[0351] A package according to paragraph [0029] wherein the spacer keel comprises a first portion defining in part the first slot and a second portion defining in part the second slot, the first and second portion being arranged to form an inverted "V" shape.

[0352] A package according to paragraph [0026] wherein the top panel comprises a first slot for receiving a portion of at least one article in a first row of articles, and a second slot for receiving a portion of at least one article in a second row of articles, the first and second slots extending transversely to the longitudinal direction, the top panel comprising a spacer keel disposed between the first and second rows of articles.

[0353] A package according to paragraph [0032]

wherein the spacer keel comprises a first portion defining in part the first slot and a second portion defining in part the second slot, the first and second portion being arranged to form a valley trough or "V" shape, the first portion being hinged to the second portion by a hinged connection.

[0354] A package according to paragraph [0026] wherein the top panel comprises a first slot for receiving a portion of at least one article in a first row of articles, and a second slot for receiving a portion of at least one article in a second row of articles, the first and second slots extending longitudinally in the top panel.

[0355] A package according to paragraph [0001] wherein the at least one first inner carrier comprises first and second side wall panels each of the first and second side wall panels comprising an oblique fold line in each of the upper corners thereof, whereby facilitating folding of the first and second side wall panels about a shoulder portion of an adjacently disposed article.

[0356] A package according to paragraph [0001] wherein the outer shell is formed from a material selected from the group consisting of: paperboard, cardboard, coated board, plastics material and polymeric substrates.

[0357] It can be appreciated that various changes may be made within the scope of the present invention, for example, the size and shape of the panels and apertures may be adjusted to accommodate articles of differing size or shape.

[0358] It will be recognized that as used herein, directional references such as "top", "bottom", "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.

[0359] 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. A fold line is typically a scored line, an embossed line, or a debossed line. Any reference to hinged connection or fold line should not be construed as necessarily referring to a single fold line only; indeed it is envisaged that hinged connection can be formed from any one or more of the following, a short slit, a frangible line or a fold line without departing from the scope of the invention.

[0360] As used herein, the term "severance line" refers to all manner of lines that facilitate separating portions of the substrate from one another or that indicate optimal separation locations. Severance lines may be frangible or otherwise weakened lines, tear lines, cut lines, or slits.

[0361] It should be understood that hinged connection, severance lines 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.

10 Claims

1. A package comprising a first inner carrier and a second outer carrier, the first inner carrier having a first tubular axis, the second outer carrier having a second tubular axis, and the second outer carrier being disposed, at least in part, on the outside of the first inner carrier, wherein the first inner carrier comprises a first bottom wall and the second outer carrier comprises a second bottom wall, wherein the first bottom wall comprises a first alignment aperture for facilitating assembly of the first inner carrier about a group of articles, and wherein the second bottom wall comprises a second alignment aperture for facilitating assembly of the second outer carrier, the first alignment aperture configured to allow movement of a machine component in two directions in assembling the package.
2. A package comprising at least one first inner carrier and a second outer carrier, the or each of the at least one first inner carrier having a first tubular axis, the second outer carrier having a second tubular axis, and the second outer carrier being disposed, at least in part, on the outside of the first inner carrier such that the first and second tubular axes are substantially perpendicular wherein the or each at least one first inner carrier comprises a first tubular structure formed from a first top panel, first and second side panels, a first composite bottom wall formed from a first bottom panel disposed in at least partial overlapping relationship with a second bottom panel, and wherein the or each at least one second outer carrier comprises a first tubular structure formed from a second top panel, third and fourth side panels, a second composite bottom wall formed from a third bottom panel disposed in at least partial overlapping relationship with a fourth bottom panel, wherein one of the first and second bottom panels comprises a first alignment aperture for facilitating assembly of the first inner carrier about a group of articles, wherein one of the third and fourth bottom panels comprises an alignment aperture for facilitating assembly of the second outer carrier, the first alignment aperture configured to allow movement of a machine component in two directions during assembly of the package.
3. A package according to claim 1 or 2 wherein the first

alignment aperture is shaped to allow movement of a machine component in two substantially perpendicular directions during assembly of the package.

4. A package according to claim 1 or 2 wherein the first alignment aperture is shaped such that a machine component is moveable in a first direction substantially perpendicular to the tubular axis of the first inner carrier so as to facilitate assembly of the first inner carrier and in a second direction substantially parallel with the tubular axis of the first inner carrier so as to facilitate assembly of the second outer carrier. 5
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5. A package according to claim 1 or 2 wherein the first alignment aperture is shaped to facilitate alignment of the third and fourth panels of the second outer carrier with respect to each other and to facilitate alignment of the third and fourth panels of the second outer carrier with respect to the first bottom panel of the first inner carrier. 15
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6. A package according to claim 1 wherein the first bottom wall is disposed in overlying relationship with the second bottom wall. 25
7. A package according to claim 1 wherein the first bottom wall comprises first and second panels and the second bottom wall comprises third and fourth panels, wherein the first alignment aperture is shaped to facilitate alignment of the third and fourth panels of the second bottom wall with respect to each other and to facilitate alignment of the third and fourth panels of the second bottom wall with respect to the first bottom panel of the first bottom wall. 30
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8. A package according to claim 1 wherein the first tubular axis is substantially perpendicular to the second tubular axis. 35
9. A package according to claim 1 wherein the first inner carrier comprises a first tubular structure formed from a first top panel, first and second side panels, a first composite bottom wall formed from a first bottom panel disposed in at least partial overlapping relationship with a second bottom panel; and the second outer carrier comprises a second tubular structure formed from a second top panel, third and fourth side panels, a second composite bottom wall formed from a third bottom panel disposed in at least partial overlapping relationship with a fourth bottom panel. 40
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10. A package according to claim 1 wherein the at least one first inner carrier comprises first and second side wall panels each of the first and second side wall panels comprising an oblique fold line in each of the upper corners thereof, whereby facilitating folding of the first and second side wall panels about a shoulder portion of an adjacently disposed article. 55

11. A package according to claim 1 wherein the outer shell is formed from a material selected from the group consisting of: paperboard, cardboard, coated board, plastics material and polymeric substrates.

12. A first blank for forming a first inner carrier and a second blank for forming a second outer carrier, the first blank configured to form the first inner carrier having a first tubular axis in assembled form, the second blank configured to form the second outer carrier have a second tubular axis, such that at least a portion of the second blank overlaps with at least a portion of the first blank on the outside of the first blank in assembled form, wherein the first blank comprises a first bottom wall panel and the second blank comprises a second bottom wall panel, wherein the first bottom wall panel comprises a first alignment aperture configured to facilitate assembly of the first inner carrier about a group of articles, and wherein the second bottom wall panel comprises a second alignment aperture for facilitating assembly of the second outer carrier, the first alignment aperture configured to allow movement of a machine component in two directions for bringing the first and second blanks into assembled form.

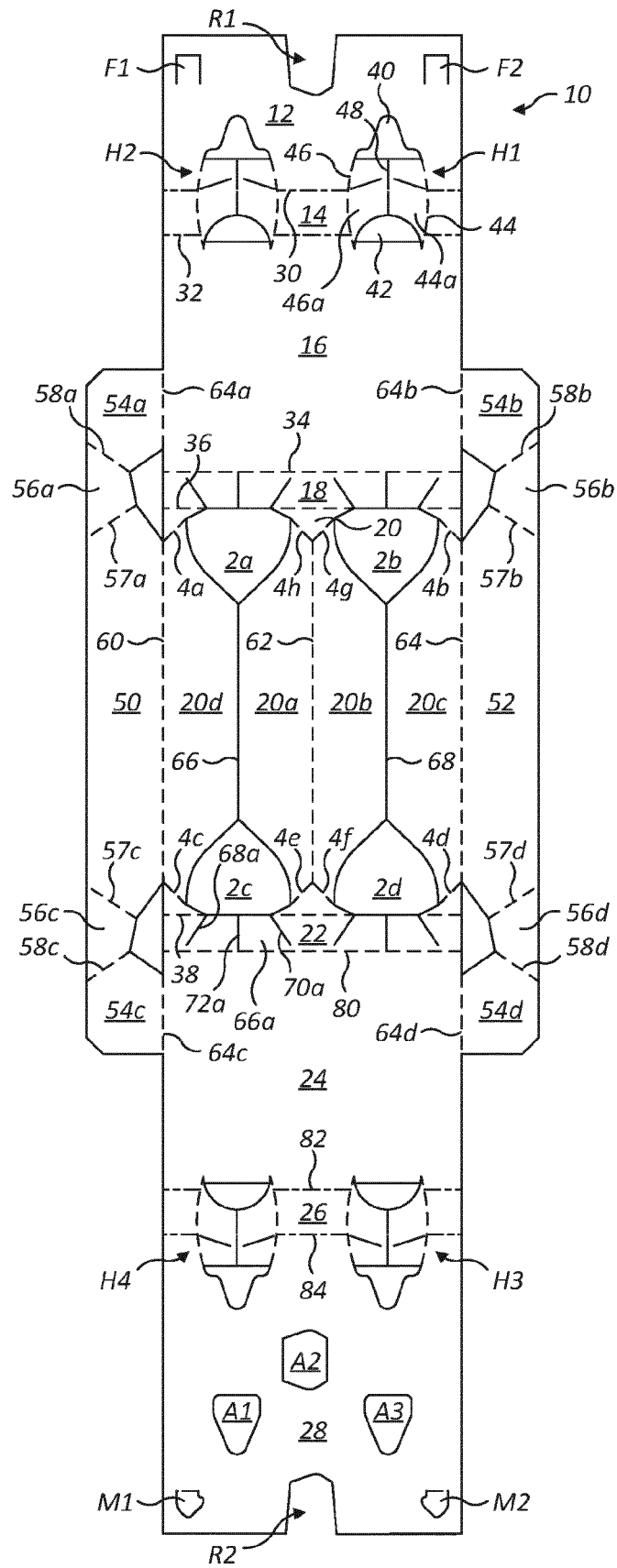


FIG. 1

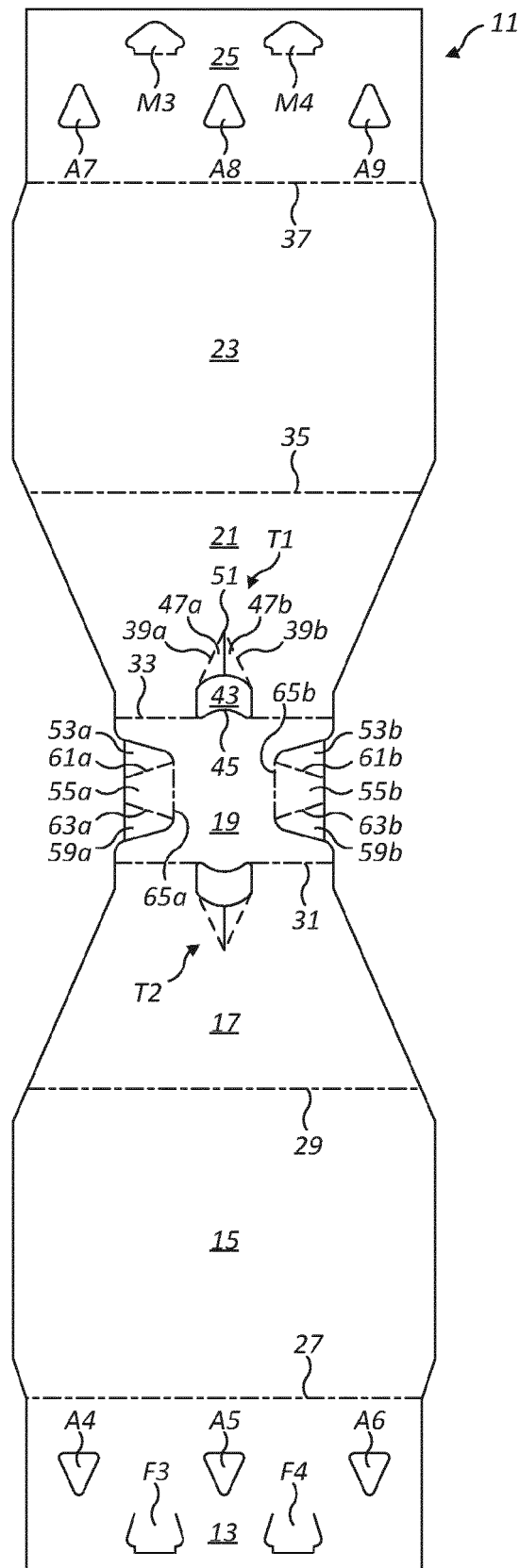


FIG. 2

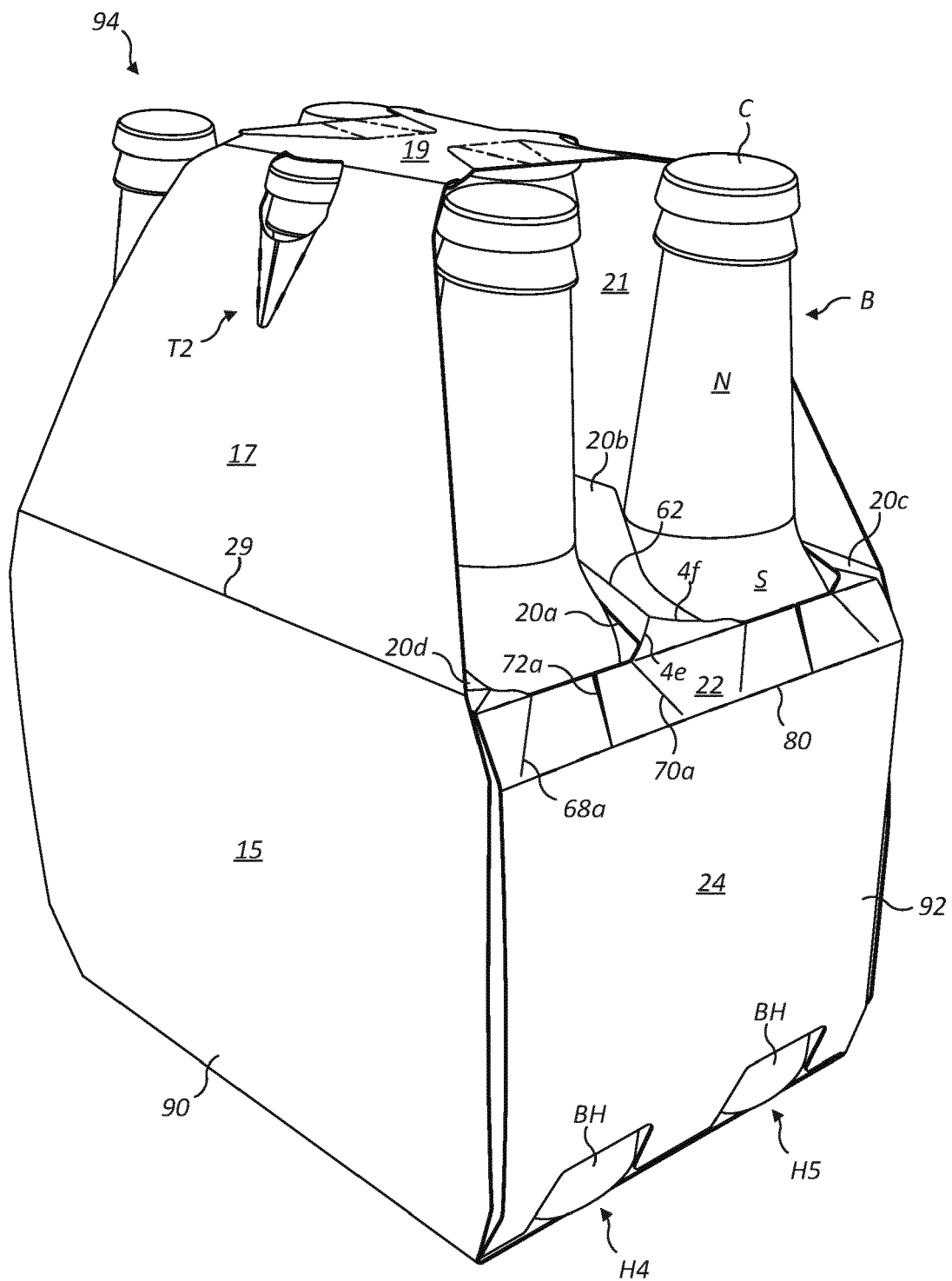


FIG. 3

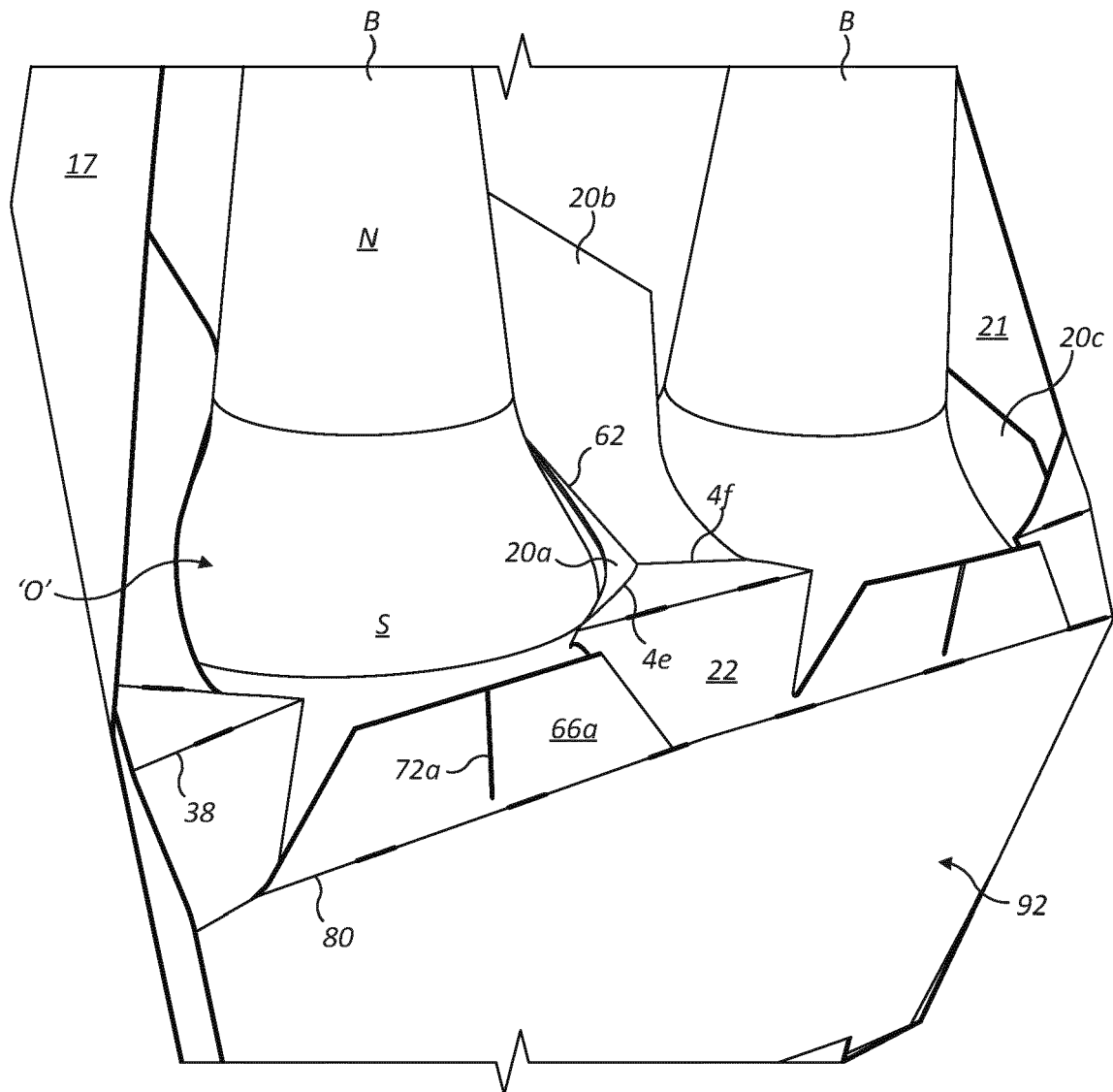


FIG. 4

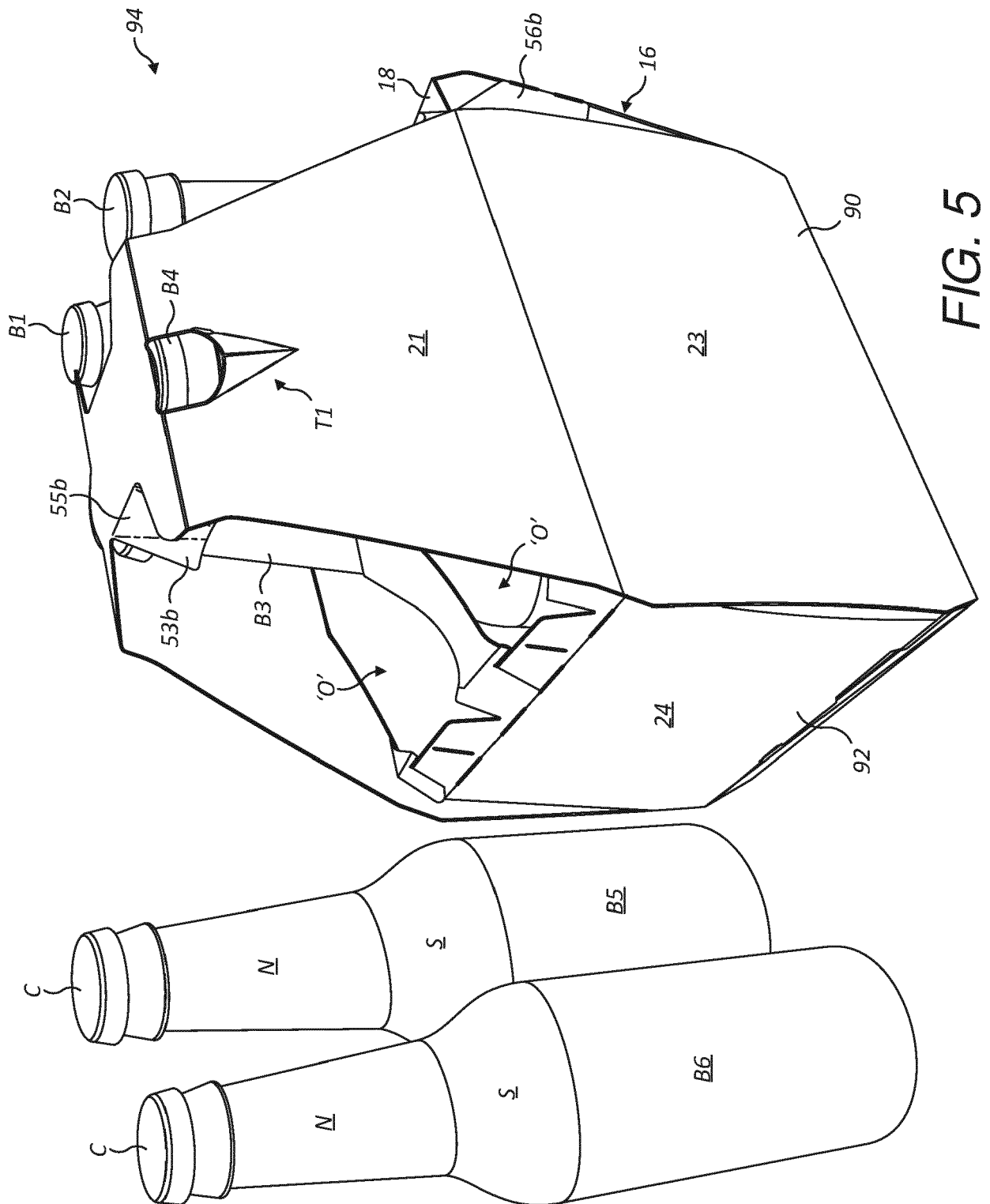


FIG. 5

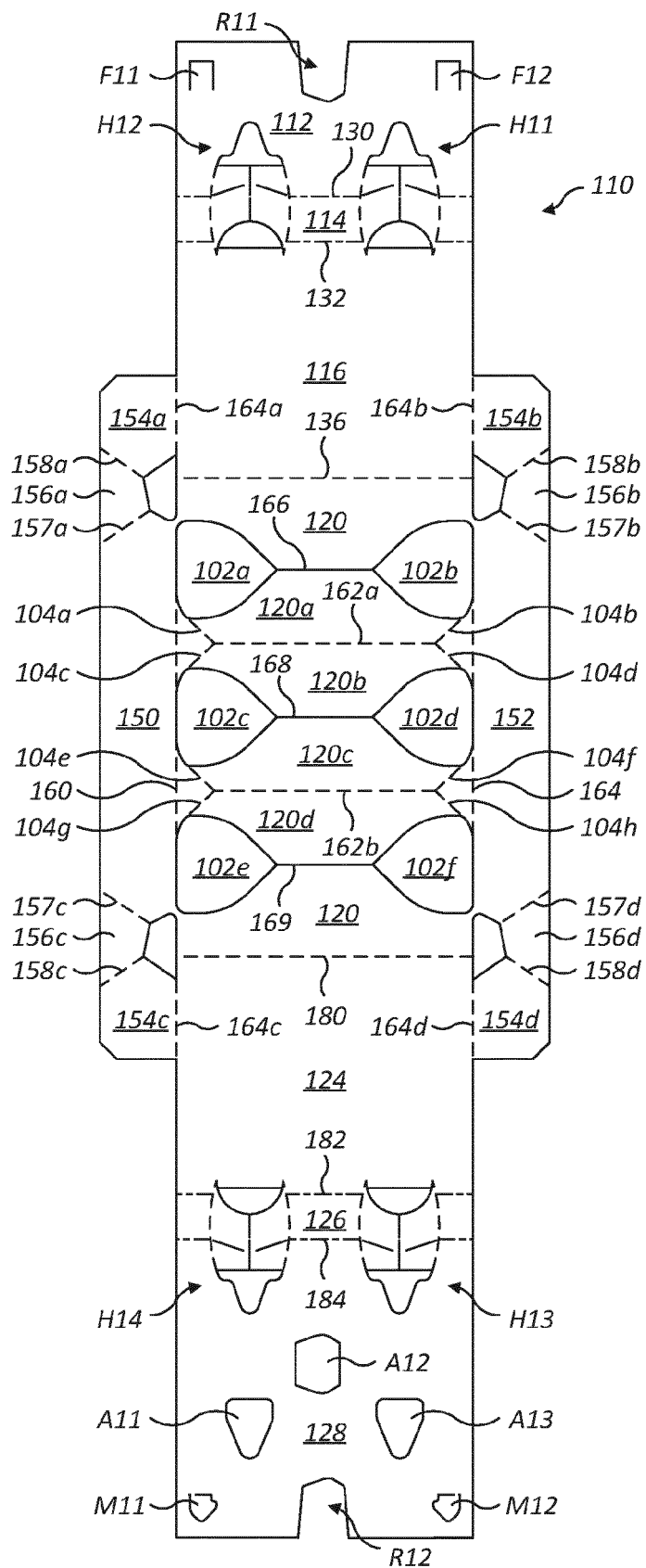


FIG. 6

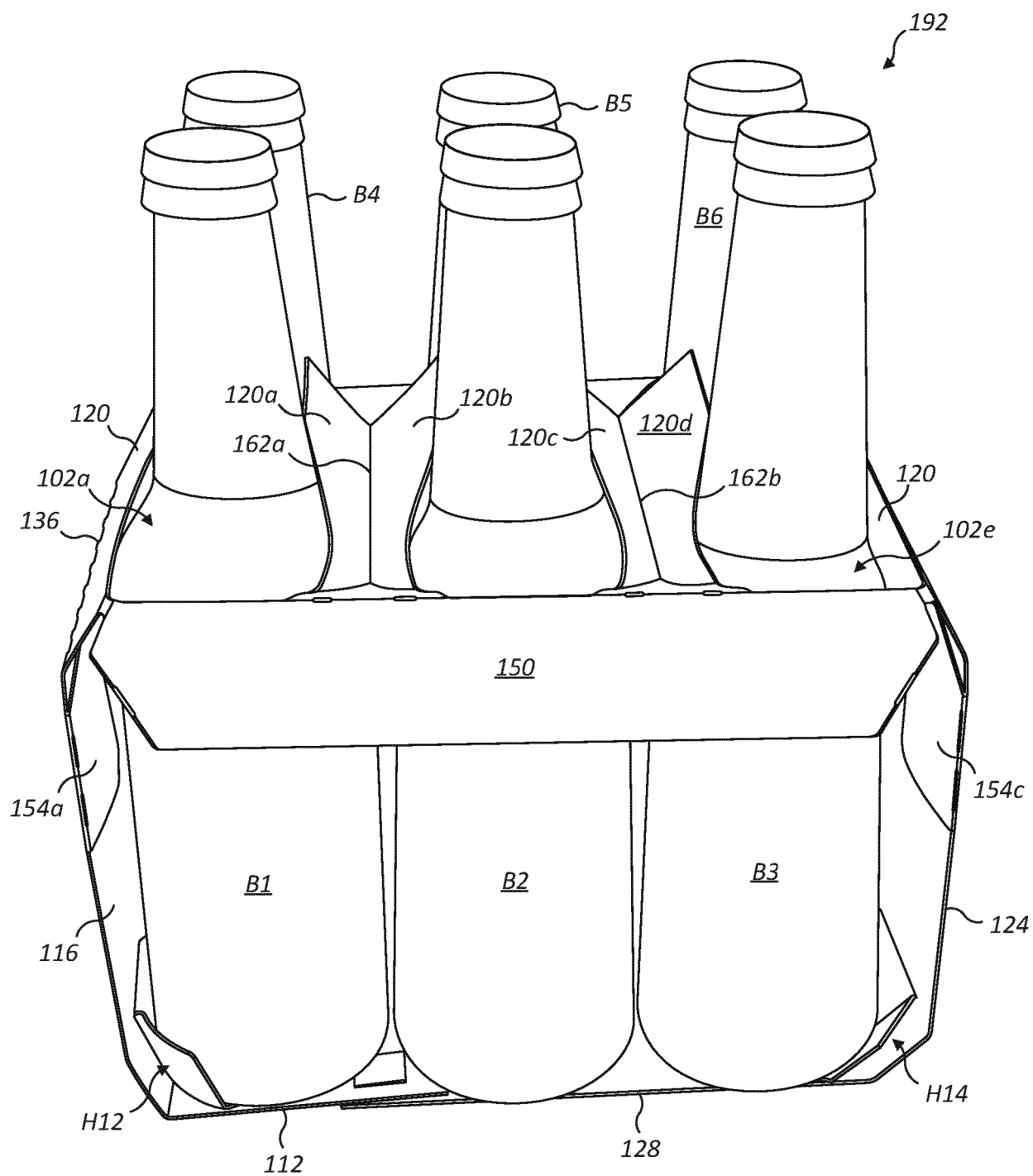


FIG. 7

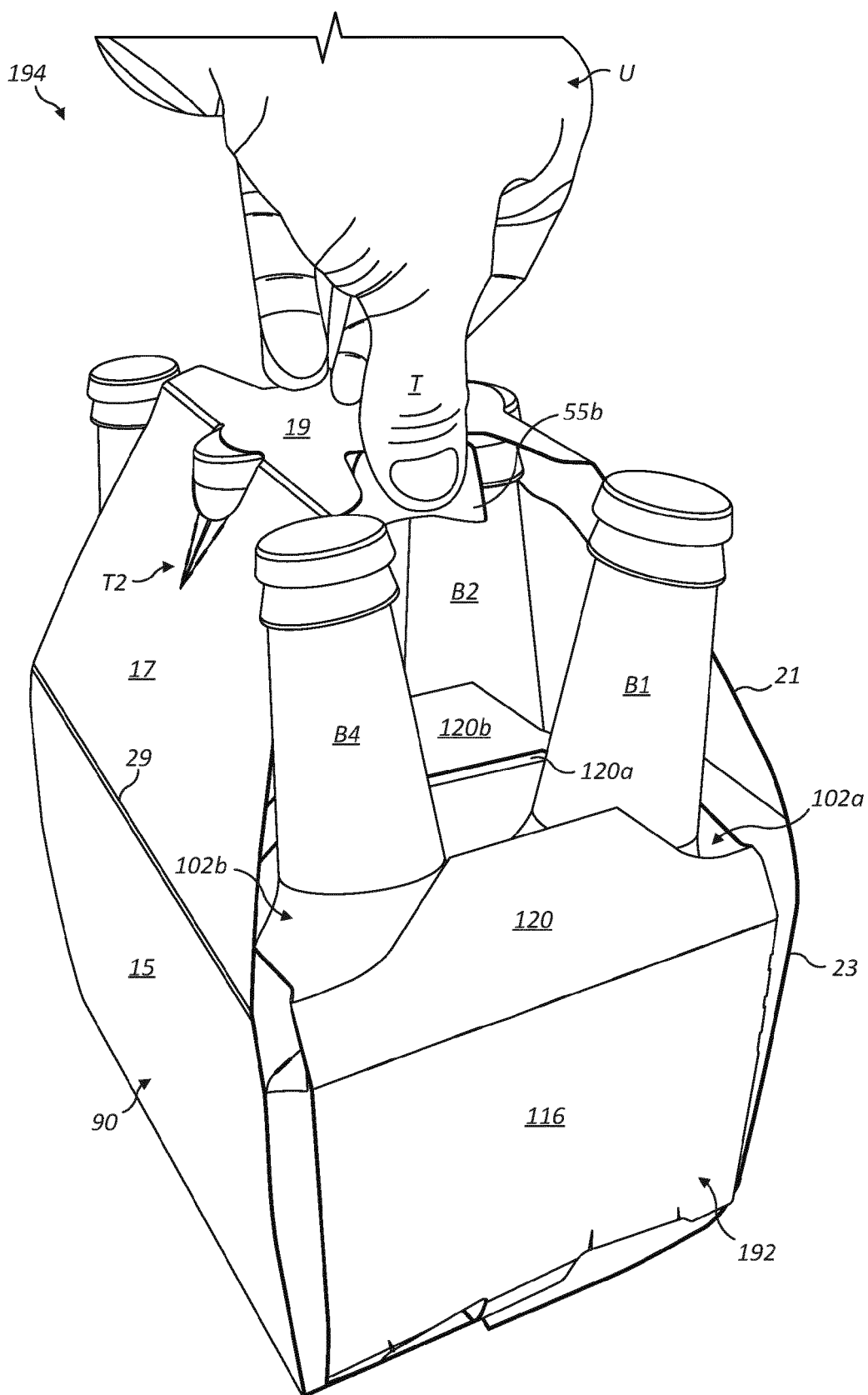


FIG. 8

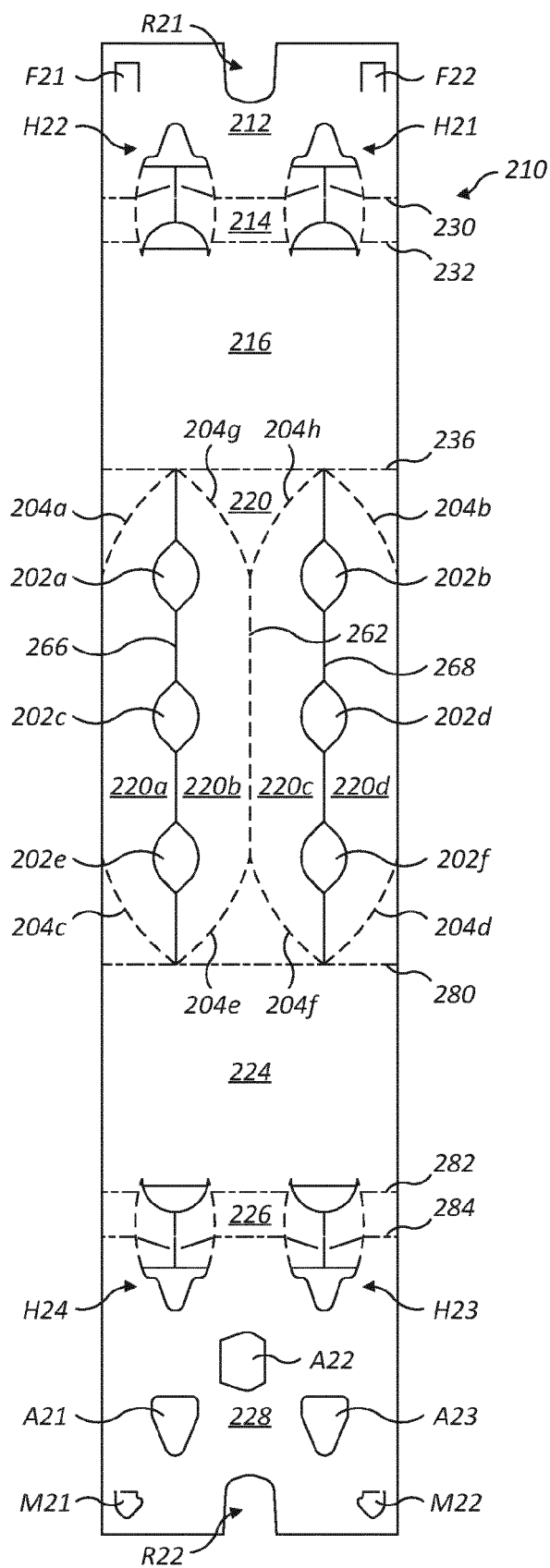


FIG. 9

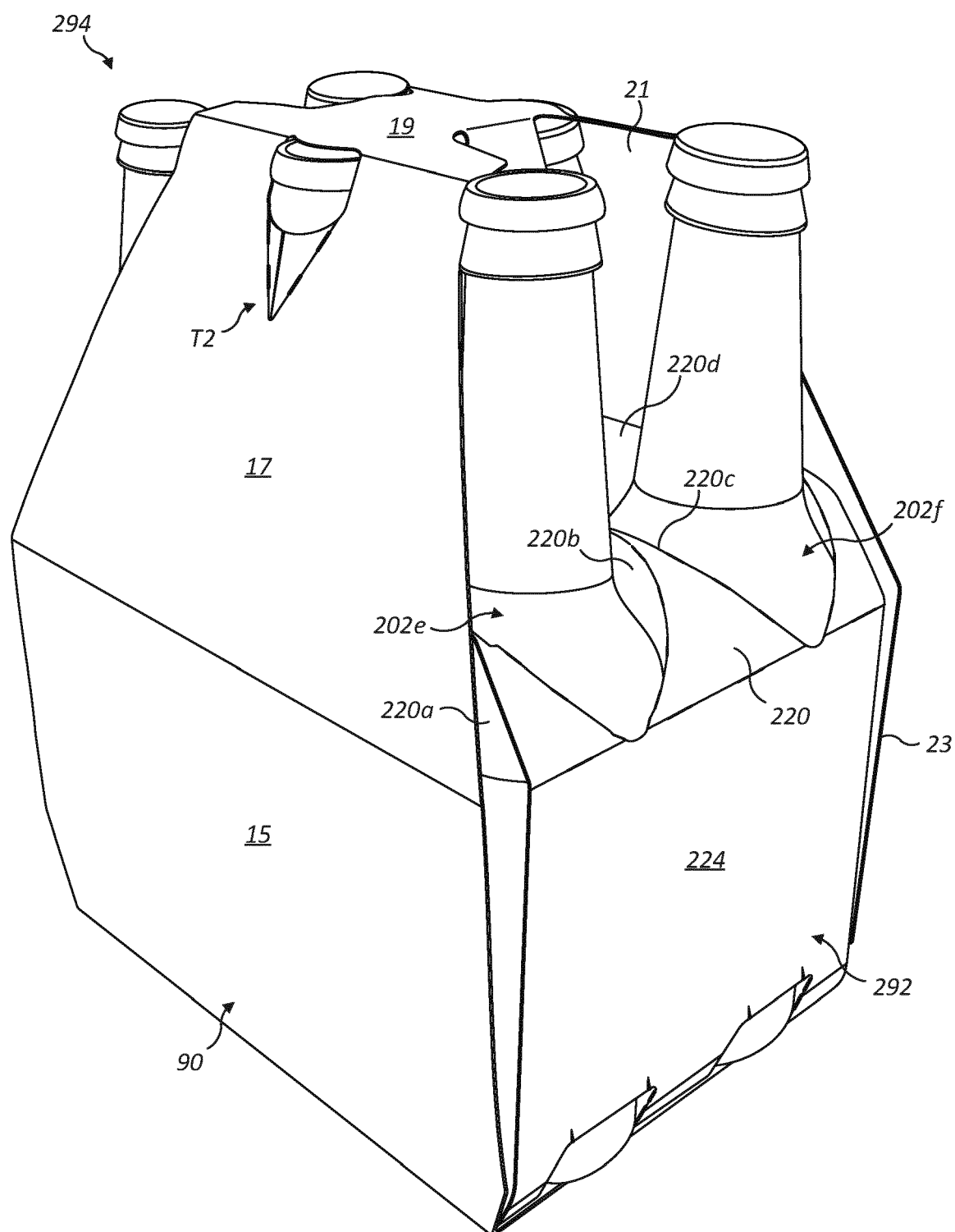


FIG. 10

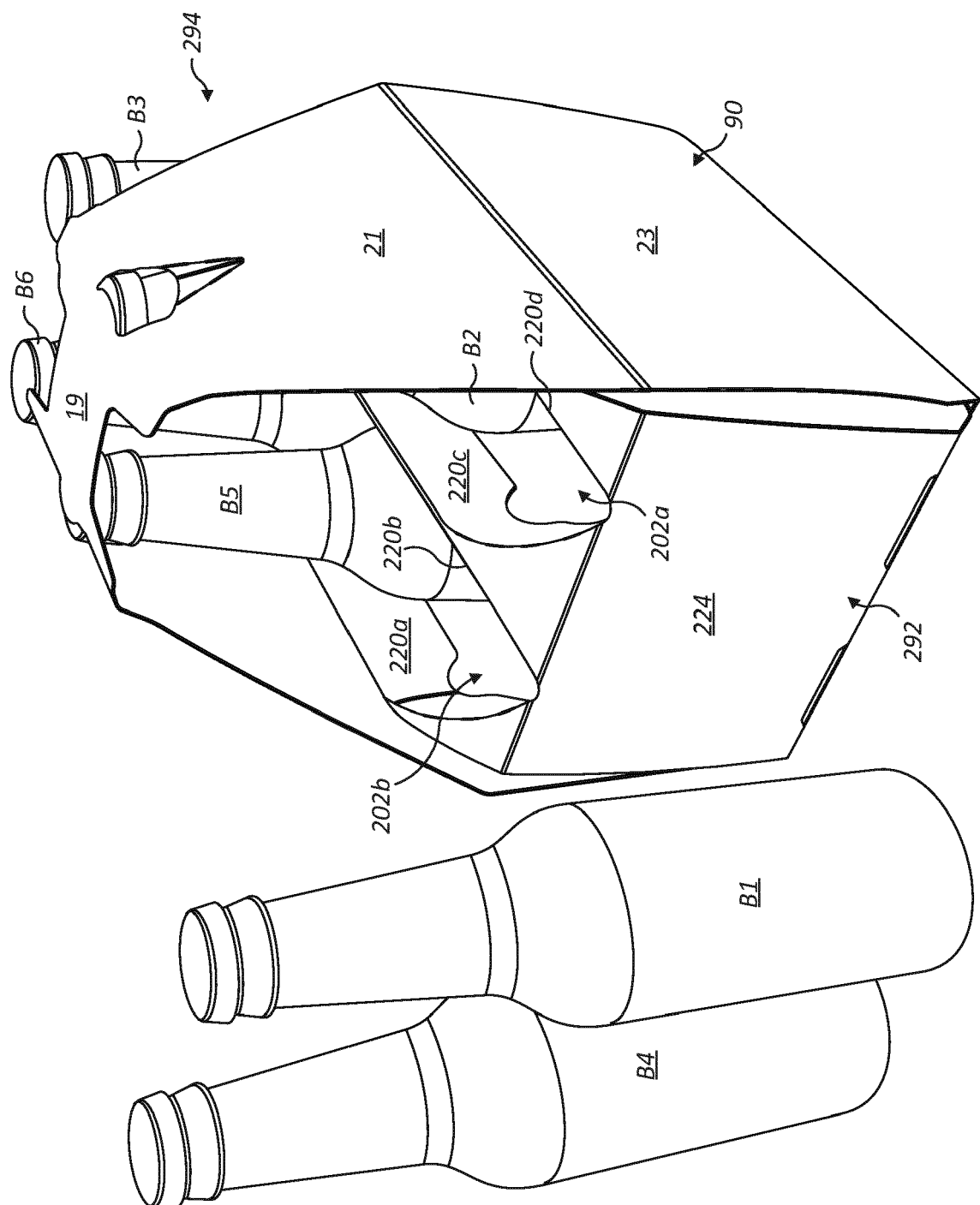


FIG. 11

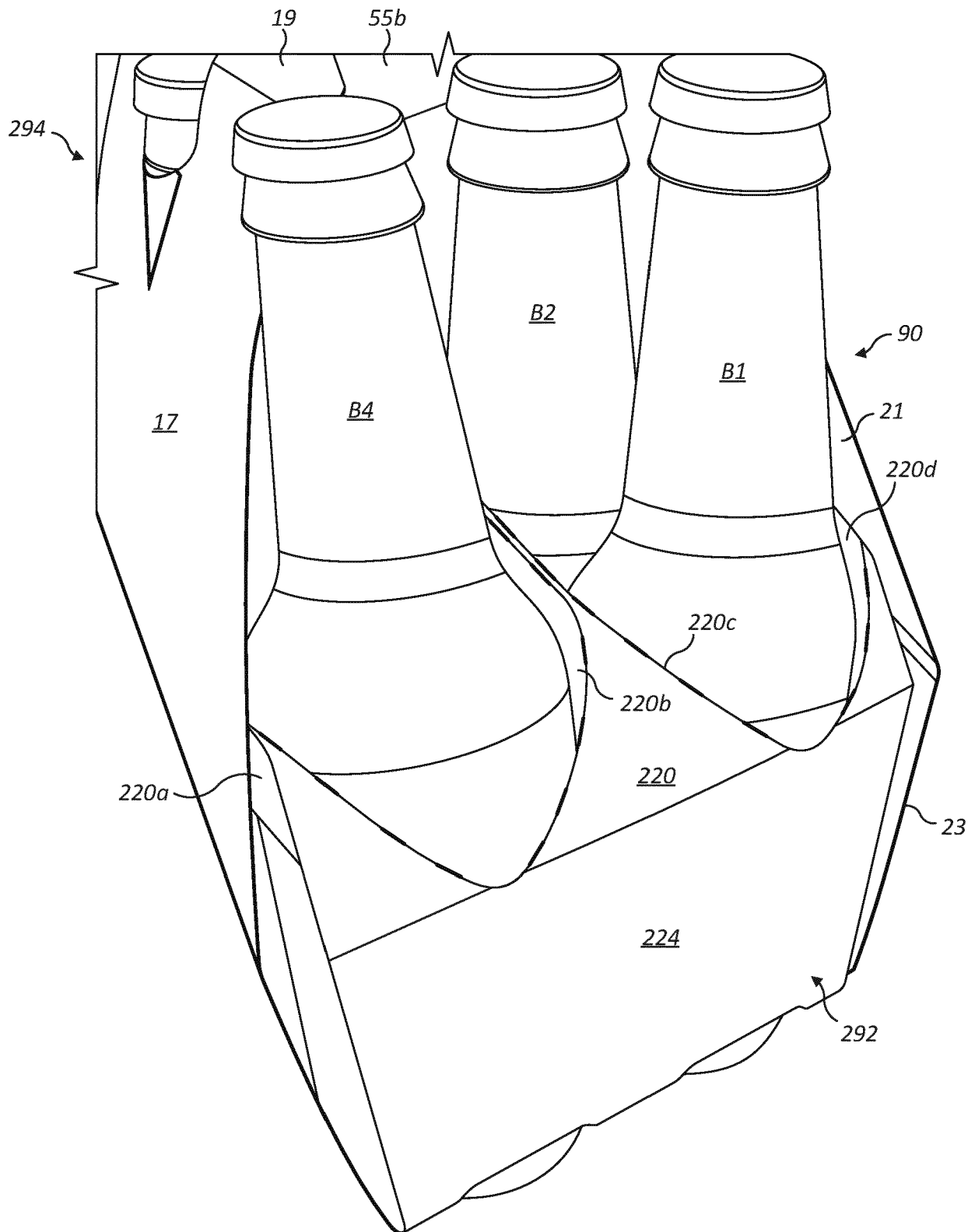


FIG. 12

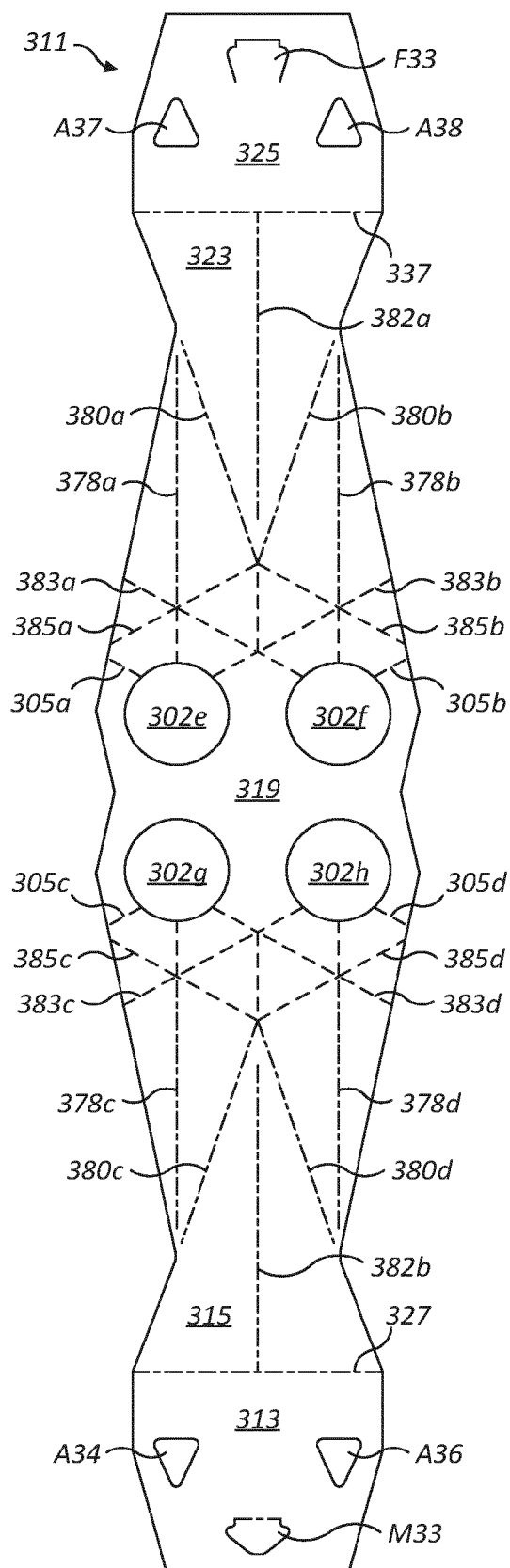


FIG. 13

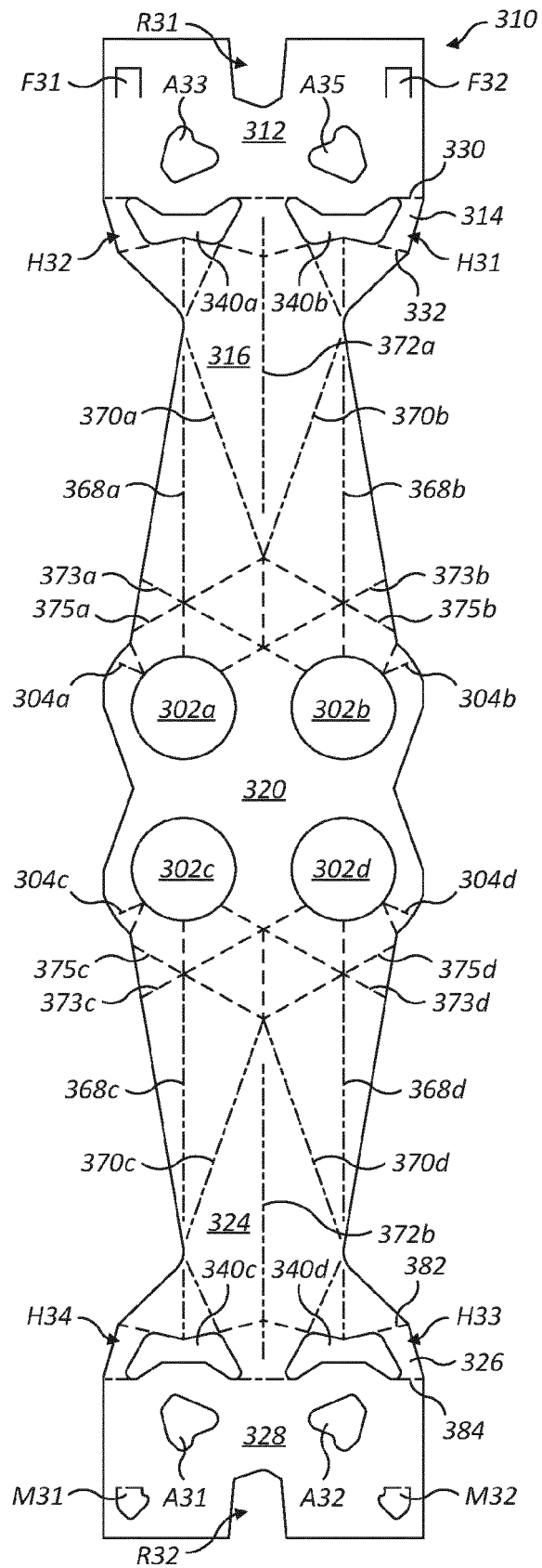


FIG. 14

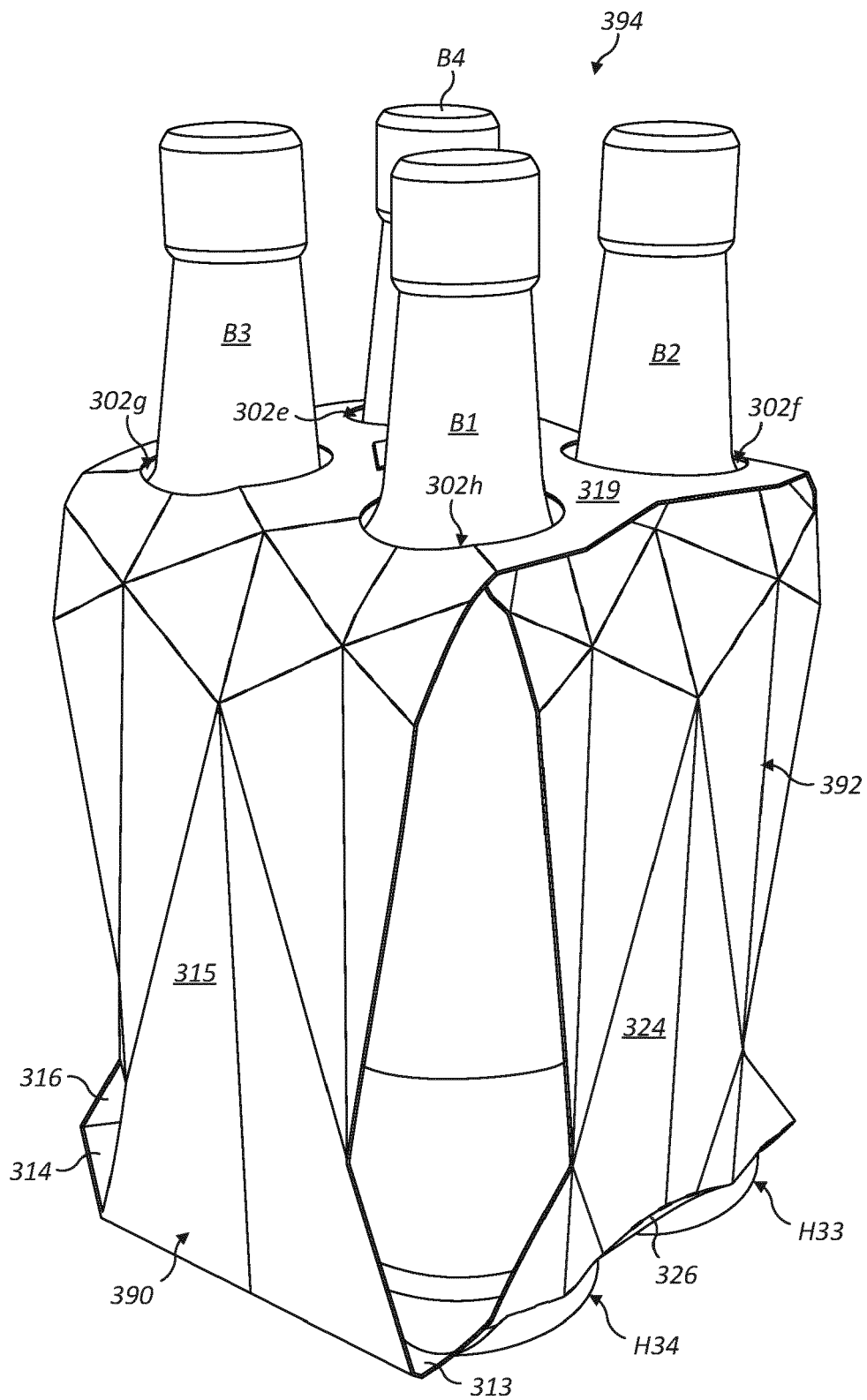


FIG. 15

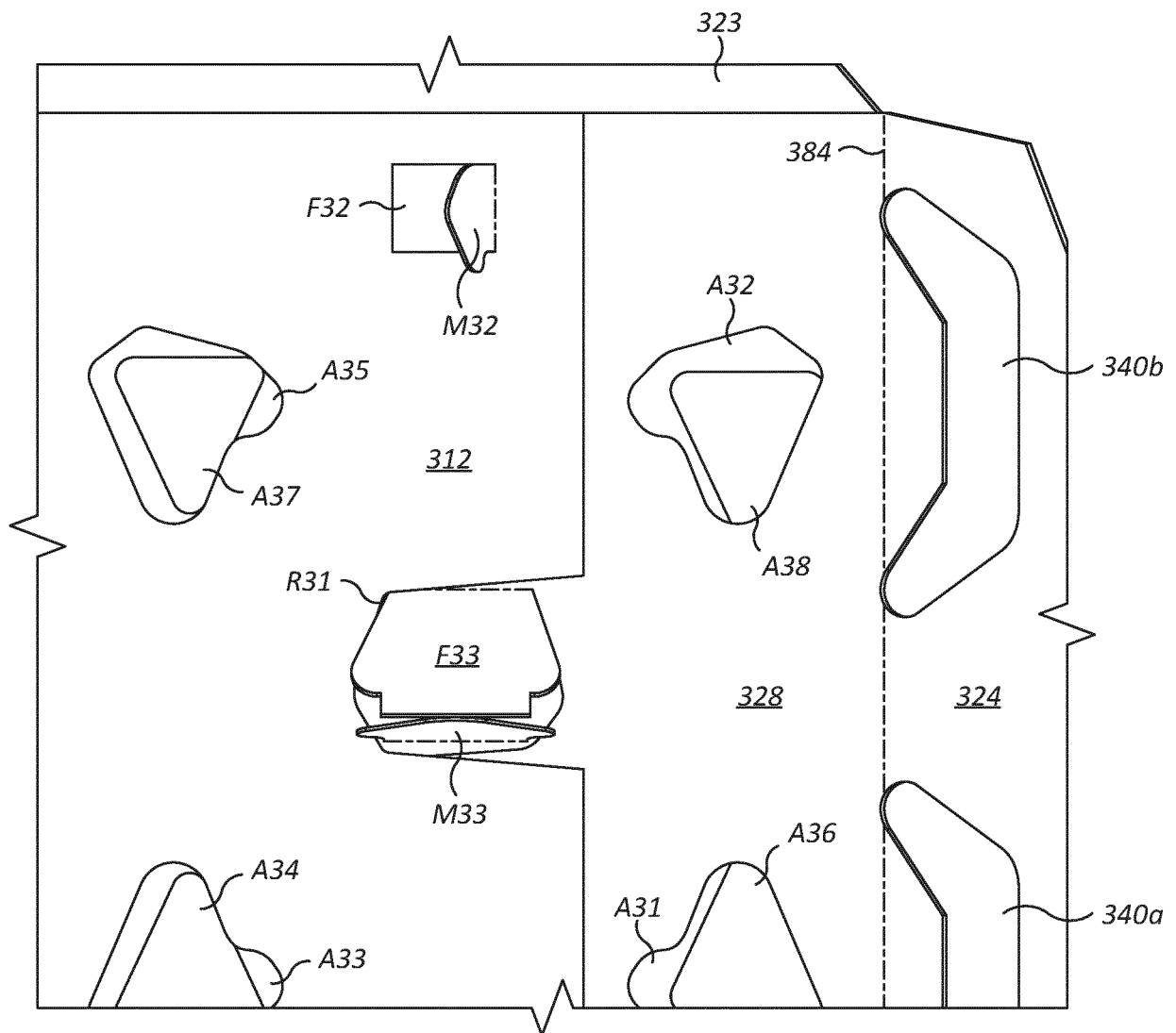


FIG. 16

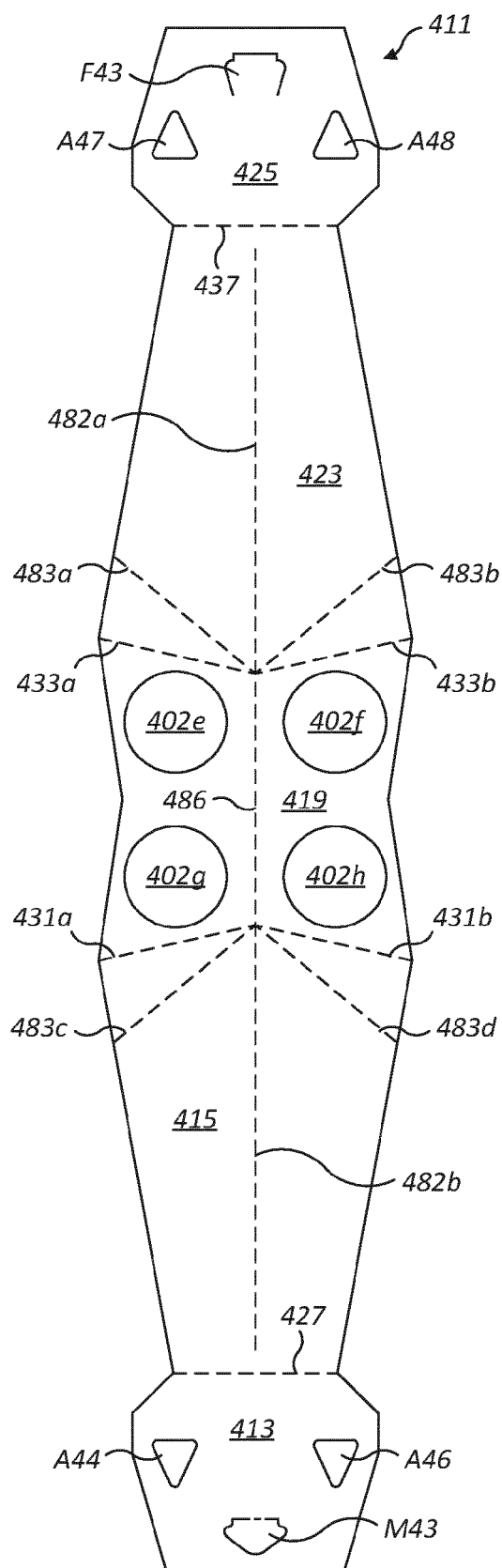


FIG. 17

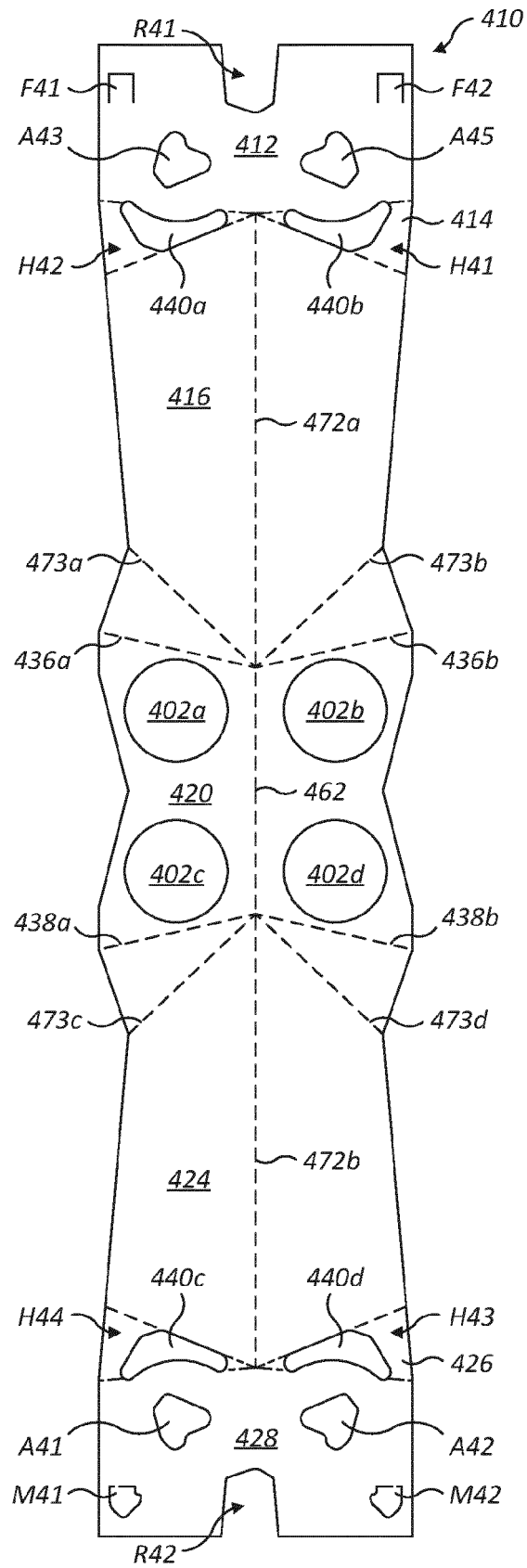


FIG. 18

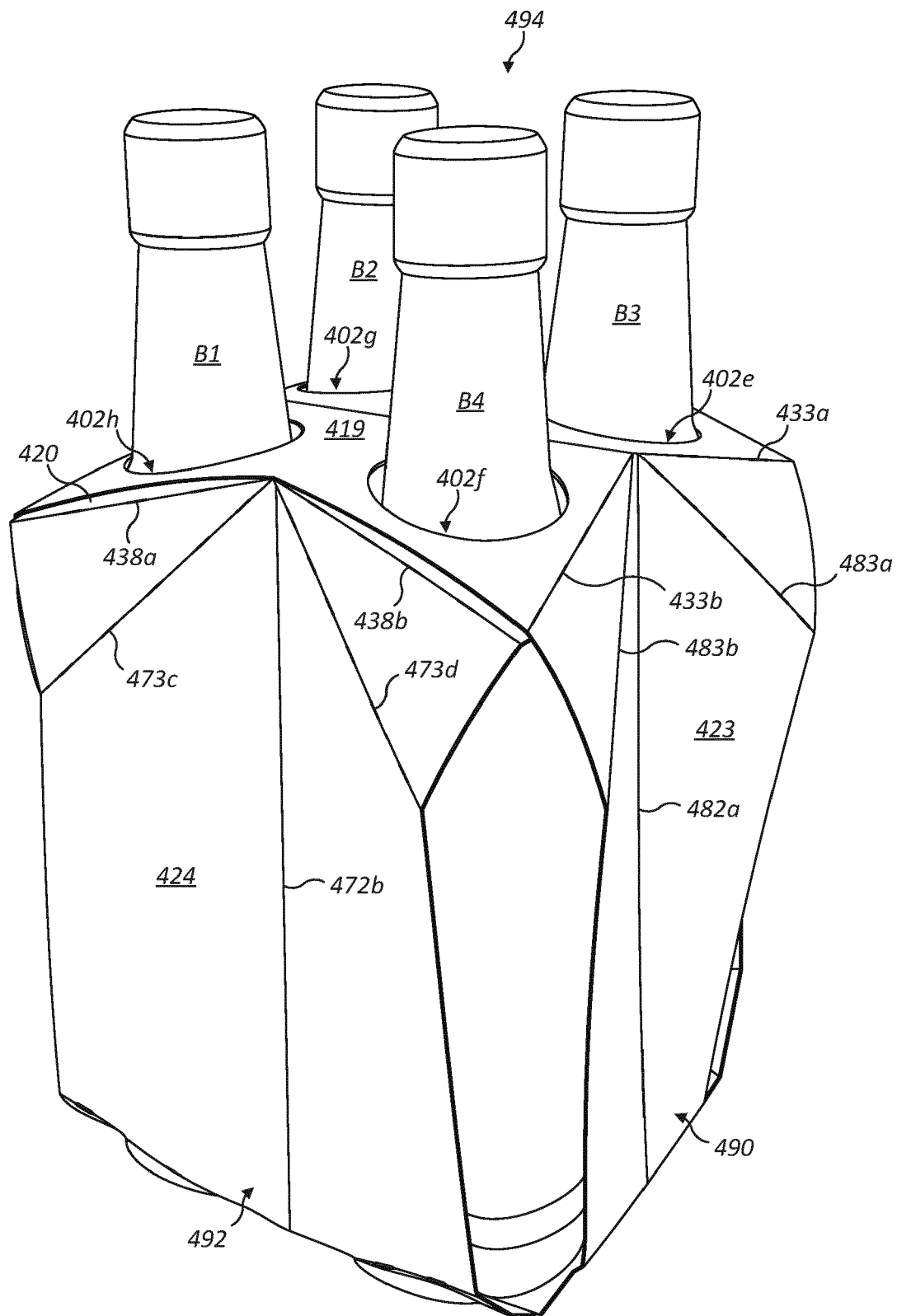


FIG. 19

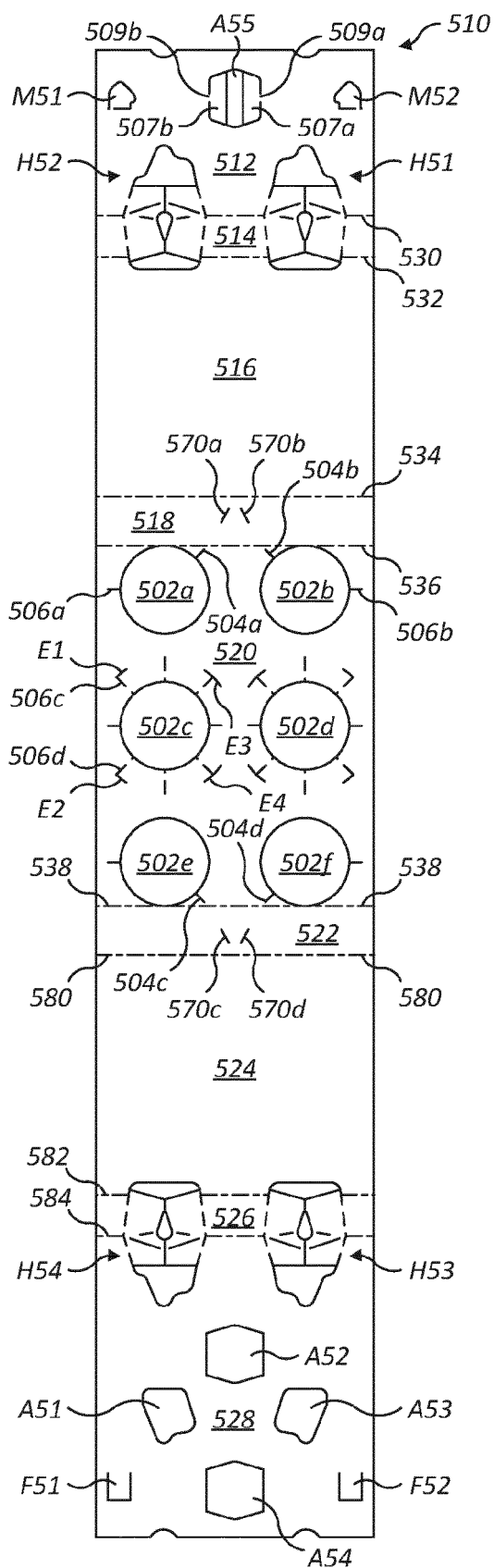


FIG. 20

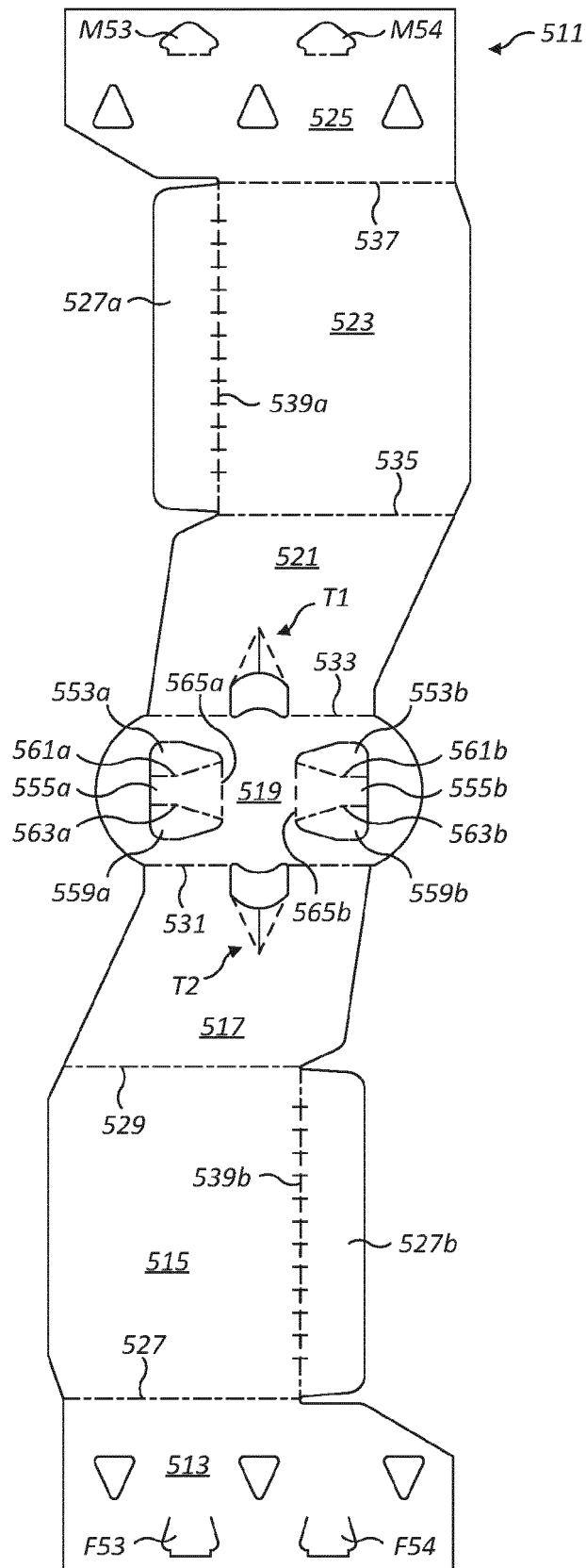


FIG. 21

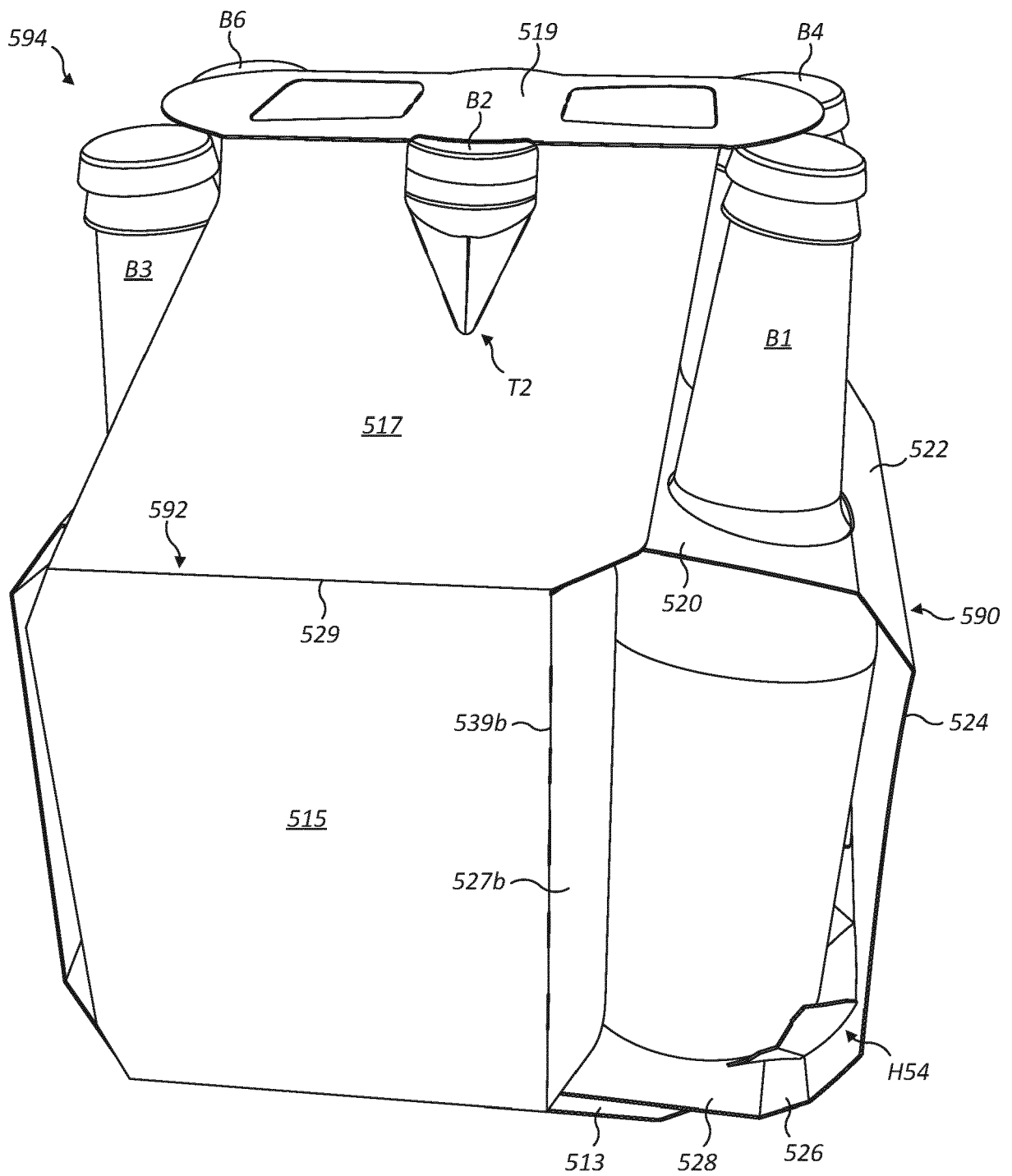


FIG. 22

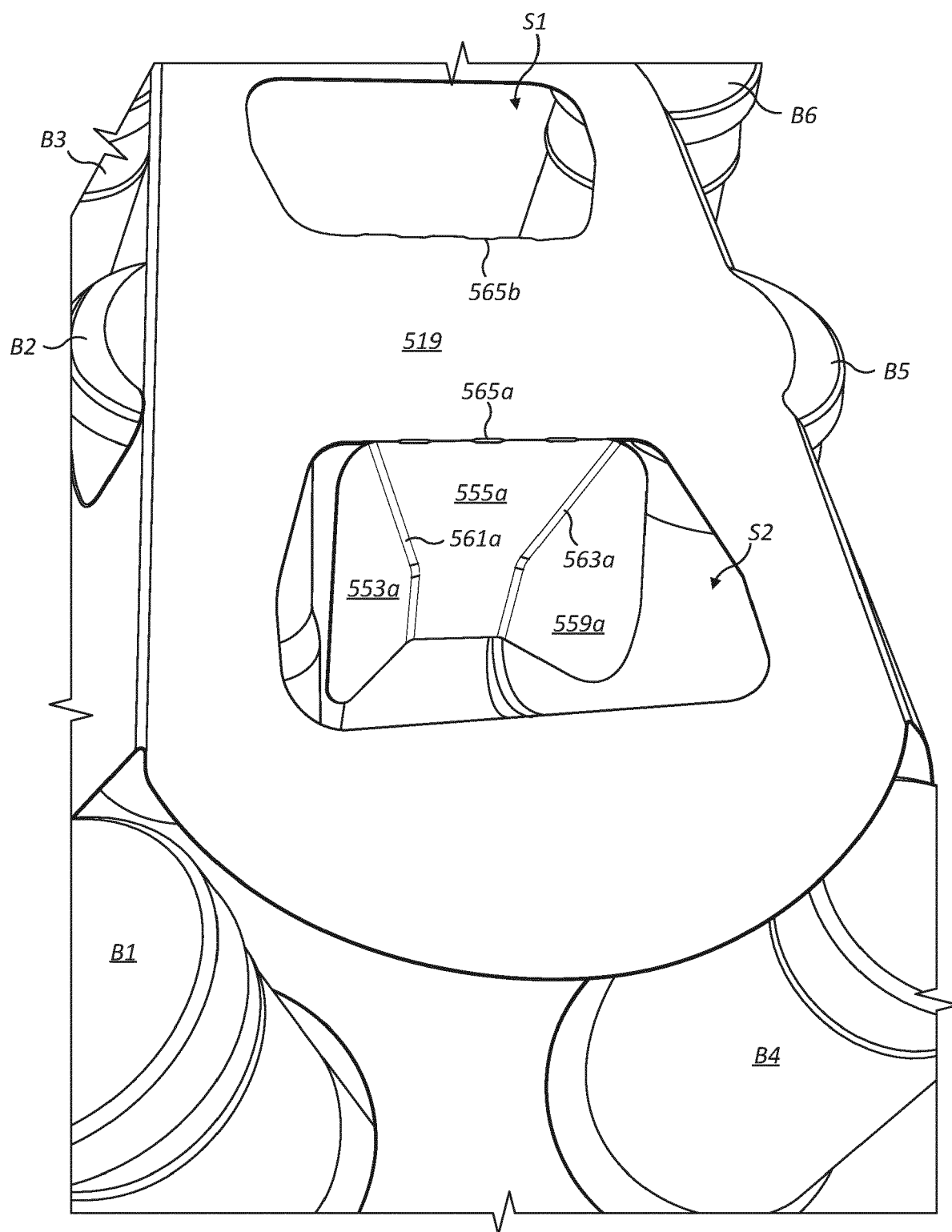


FIG. 23

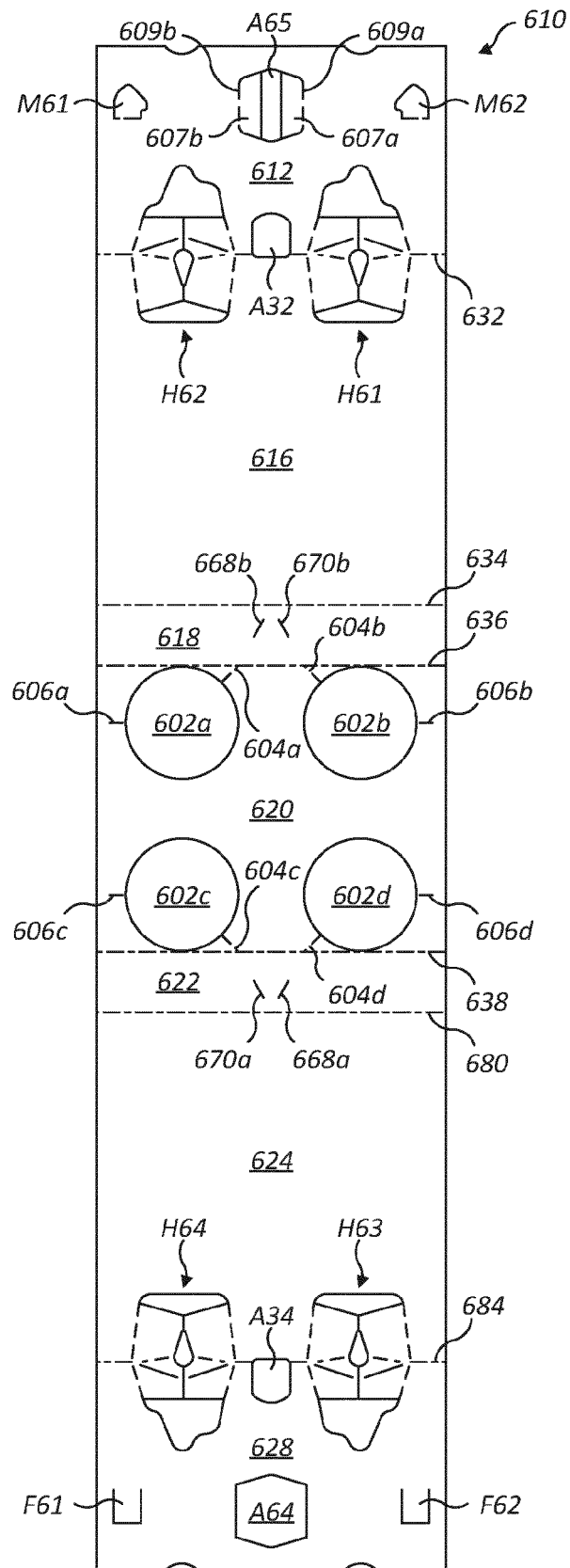


FIG. 24

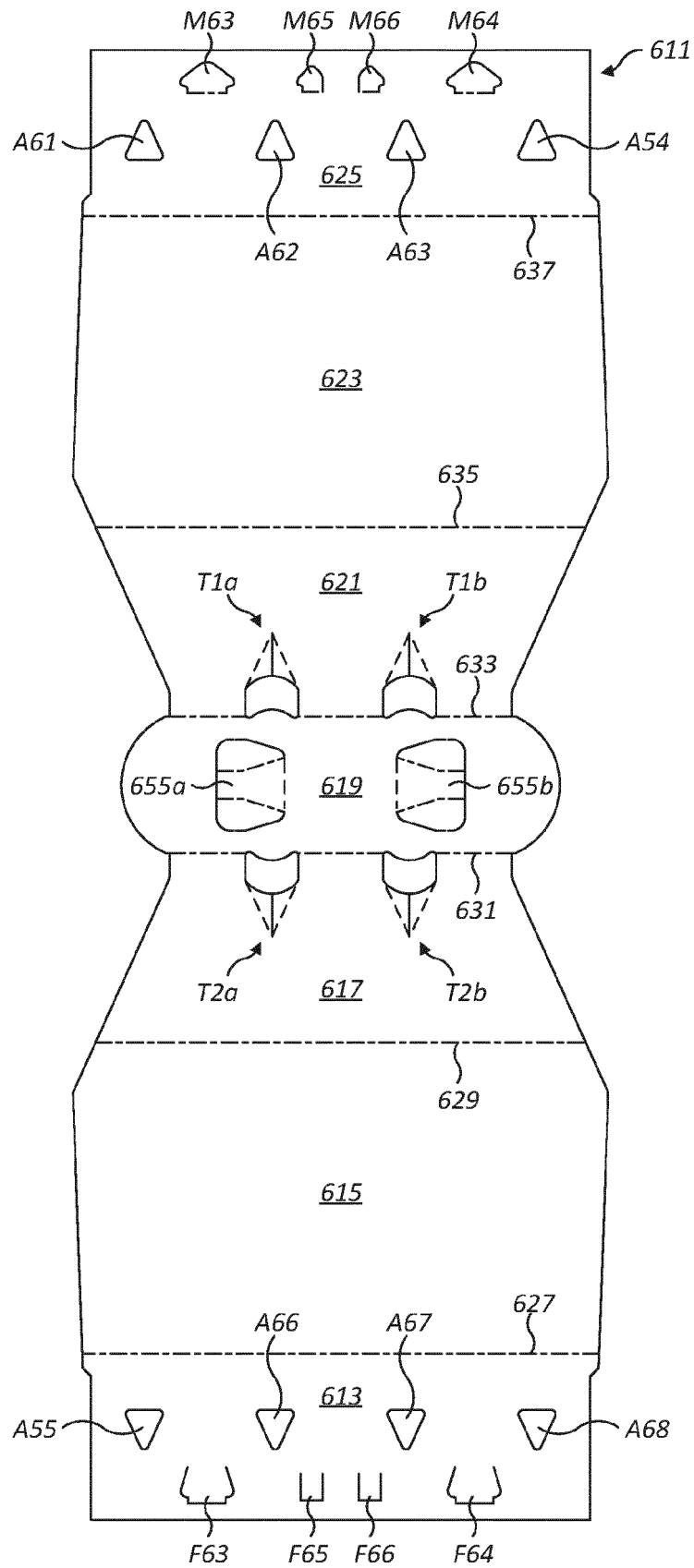


FIG. 25

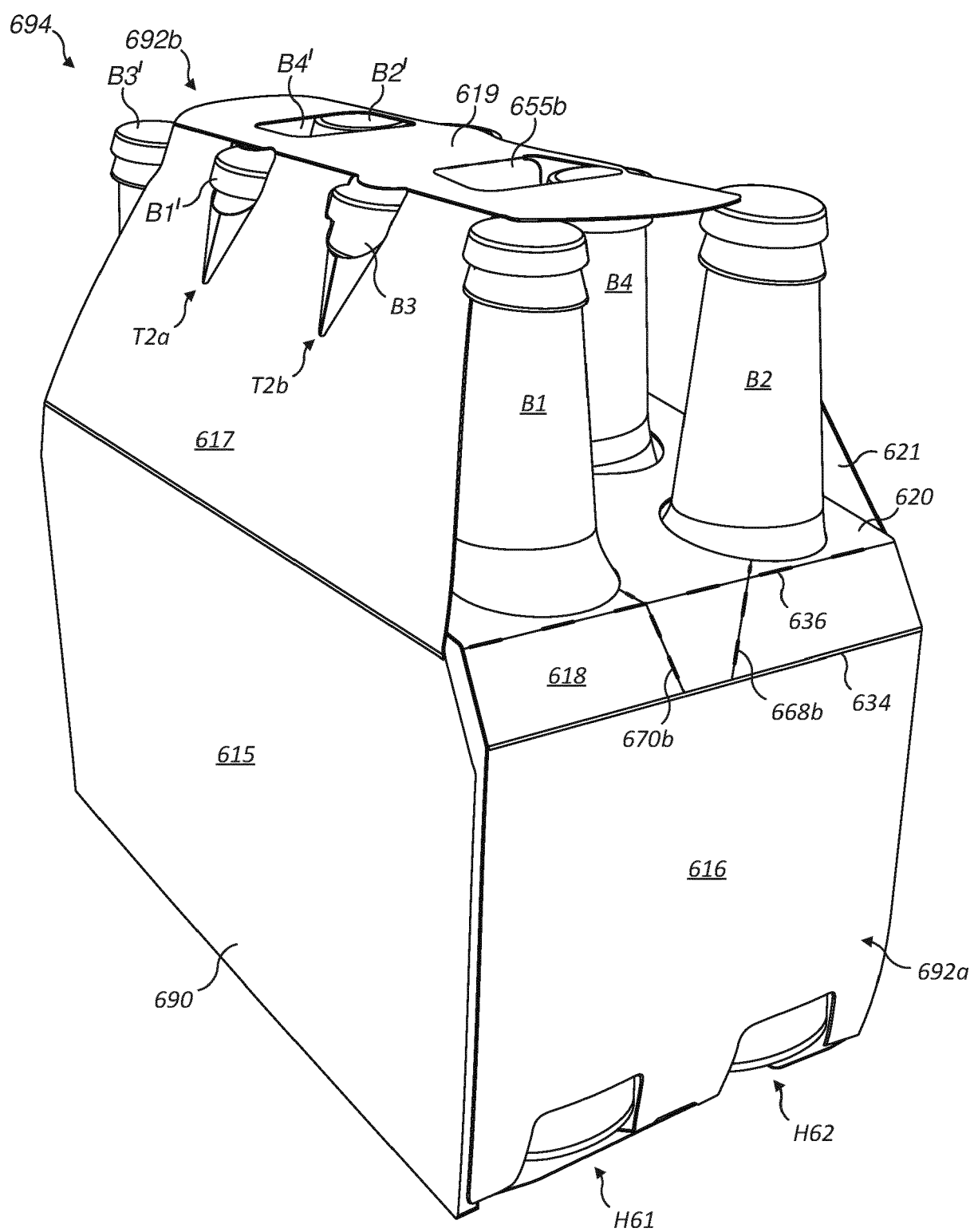


FIG. 26

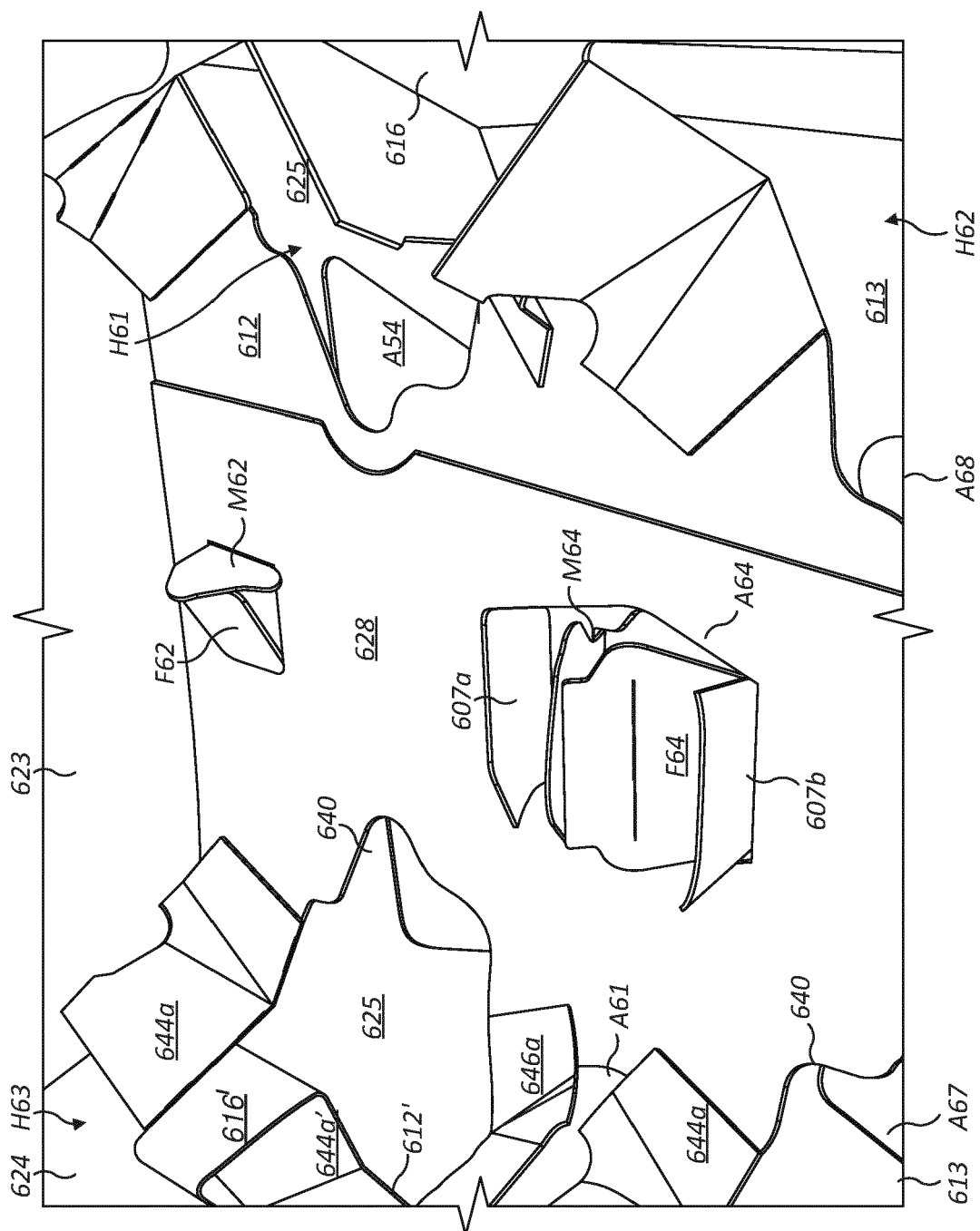


FIG. 27

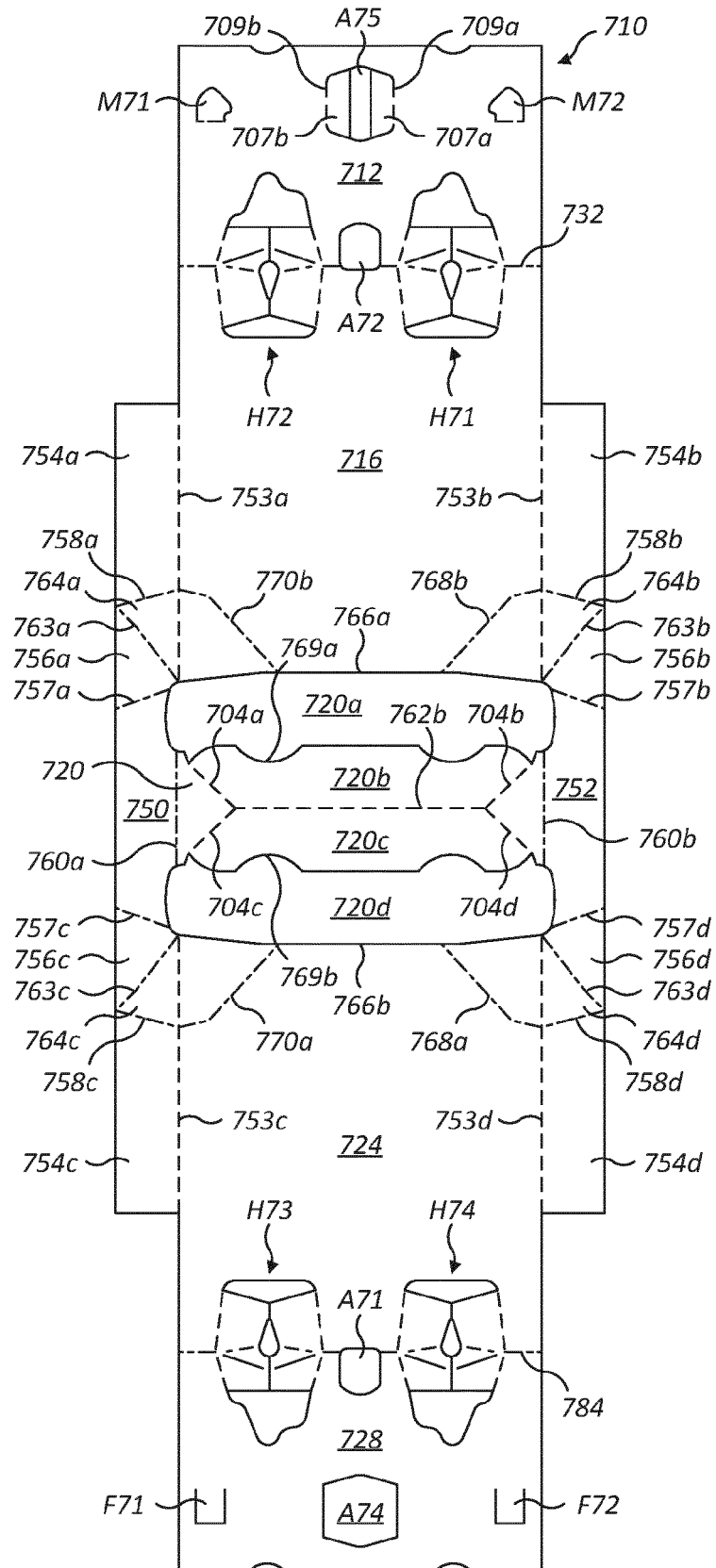


FIG. 28

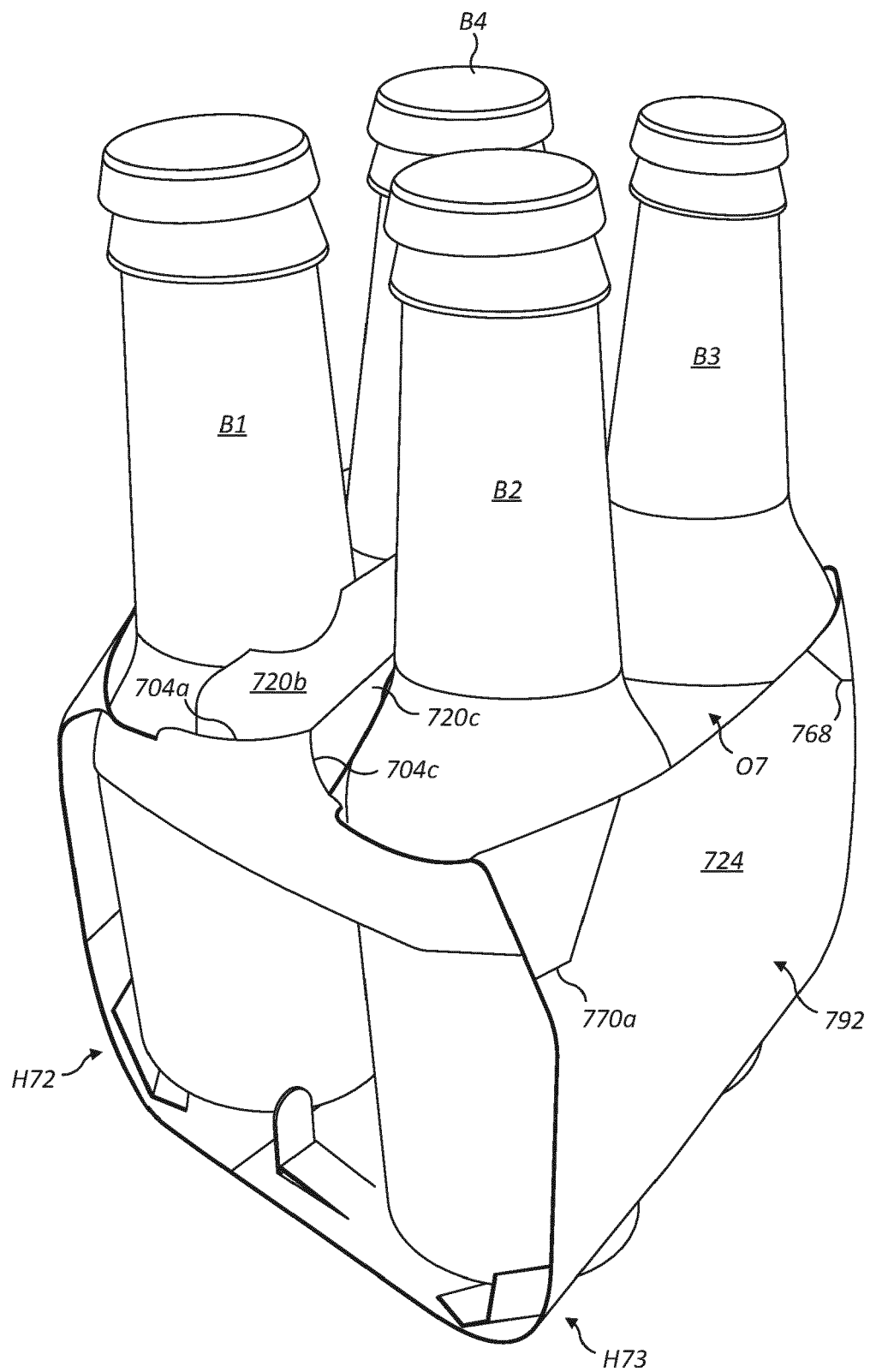


FIG. 29



EUROPEAN SEARCH REPORT

 Application Number
 EP 20 16 4943

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EPO FORM 1503 03.82 (P04C01)

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	AU 2012 201 514 A1 (MEADWESTVACO PACKAGING SYSTEMS) 4 October 2012 (2012-10-04)	1,12	INV. B65D71/38
A	* figures 20,24,25 *	2-11	

X	US 3 394 800 A (BRACKETT JOHN C ET AL) 30 July 1968 (1968-07-30)	1,12	
A	* column 2, line 4 - line 5; figures 1-6 *	2-11	
	* column 2, line 64 - line 66 *		

X	GB 1 022 545 A (JOSEPH HIRSCH VINEBERG) 16 March 1966 (1966-03-16)	1-6,8,9,11,12	B65D
A	* figures 1-4 *	7	

The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
The Hague	18 June 2020	Sundell, 011i	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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

EP 20 16 4943

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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18-06-2020

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
AU 2012201514	A1	04-10-2012	NONE	

US 3394800	A	30-07-1968	NONE	

GB 1022545	A	16-03-1966	AT 240260 B	25-05-1965
			CH 443122 A	31-08-1967
			DE 1214599 B	14-04-1966
			ES 287688 A1	16-10-1963
			FR 1357319 A	03-04-1964
			GB 1022545 A	16-03-1966

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