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(54) **Article carrier for an odd number of articles**

(57) A package comprises a wraparound carrier (70) and a plurality of articles disposed in at least two rows (B1,B2) within the carrier, the carrier comprising a top wall (16;116), first and second side walls (14,18;114,118) and a bottom wall (12/20;112/120) forming a tubular structure sized and dimensioned to tightly wraparound the at least two rows of articles (B1,B2), wherein the number of articles in a first (B1) of said rows is one greater than the number of articles in a second (B2) of said rows and the carrier being structured such that the articles in the second row nest in-between articles of the first row, the first and second side walls (14,18;114,118) each being dimensioned similarly to the length of the adjacent article row (B2,B1) and the top and bottom walls each having a maximum width that is less than the maximum diameter of an article multiplied by the number of rows such that the carrier wraps tightly about the nested group of articles, the articles at the end of the second row of articles being set inwardly of the articles at the end of the first row, the articles at the end of the first row being end-most articles of the carrier and the carrier comprising integrally formed retaining means that retains those end-most articles thereby securing all of the articles within the substantially open-ended tubular carrier.

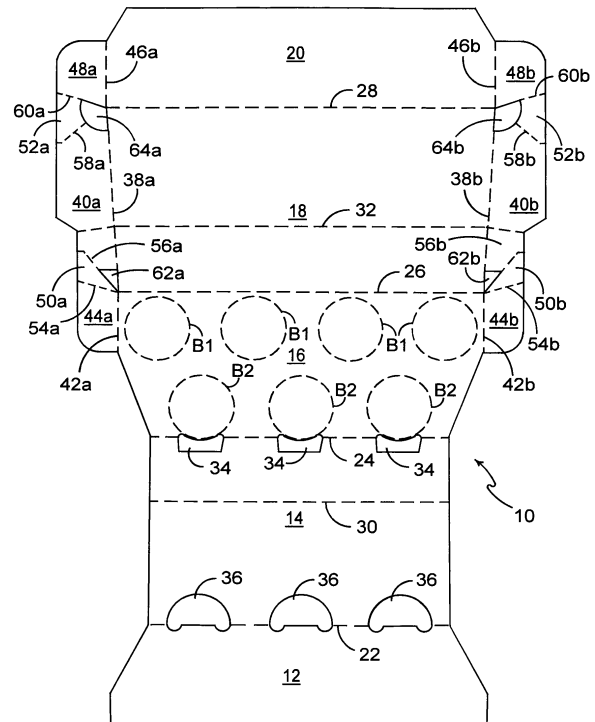


FIGURE 1

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Description

Background of the Invention

[0001] This invention relates to a carton, preferably a wraparound article carrier specifically, but not exclusively for an odd number of substantially cylindrical articles such as cans, bottles or the like.

[0002] Cartons for encasing multiple articles such as soft drink cans or bottles are useful for enabling users to transport, store, and access the articles for consumption. From the standpoint of carton users, wraparound article carriers are advantageous because they require less carton material (e.g., paperboard) than fully enclosing cartons and thus are less expensive. For the same reason, wraparound carriers are likely to be used to package relatively inexpensive products.

[0003] Typical wraparound carriers contain an even number of articles that are arranged side by side in a non-nested or non-staggered configuration. In this way, the carriers can take a symmetrical shape which is easier to design. Furthermore, an even number of cylindrical articles in particular tend to be more stabilized when arranged in a non-staggered configuration and packaged in a rectangular (parallelepiped) carton or carrier. However, cylindrical articles may also be arranged in a nested or staggered configuration, for example, to further reduce required carton material, to increase the tightness of the resultant package and/or to reduce storage space. Designing cartons or carriers for nested articles is not as simple as that for non-nested article. However, cartons or carriers for nested articles may have more attractive appearances than regular rectangular cartons. In fact, there have been cartons containing an odd number of cylindrical articles. Such cartons, typically, are non-rectangularly shaped, fully enclosed cartons.

[0004] What is needed, therefore, is a wraparound article carrier for an odd number of articles. Such an article carrier should be simple in structure and reliable in retaining articles within the carrier.

Summary of the Invention

[0005] The present invention in one aspect provides a wraparound carrier which includes a top panel having a pair of first and second opposed side edges, a pair of first and second opposed side panels, a pair of first and second bottom panels and an end retention structure. The first and second side panels are hingedly connected to the first and second opposed side edges of the top panel respectively. The first and second bottom panels are hingedly connected to the lower edges of the first and second side panels respectively. The bottom panels are secured together such that a tubular structure is provided by the top, side and bottom panels. The end retention structure is provided for at least one of the opposed ends of the tubular structure. The end retention structure includes an anchor panel hingedly connected to the end

edge of the first side panel and disposed in a face-contacting relationship with the inside surface of the first side panel, upper and lower gusset panels hingedly connected to the anchor panel and extending toward the end edge of the first side panel, and upper and lower end panels hingedly connected to the upper and lower gusset panels respectively. The upper end panel is hingedly connected to the top panel along an upper fold line and extends downwardly from the top panel whereas the lower end panel is hingedly connected to the first bottom panel along a lower fold line and extends upwardly from the first bottom panel. The upper and lower fold lines are offset from each other such that the upper and lower fold lines lie in distinct imaginary vertical planes.

[0006] Preferably, the end edge of the first side panel may be beveled such that the end edge defines an obtuse angle with respect to the first side edge of the top panel.

[0007] Optionally, the end edge of the first side panel may be beveled such that the end edge defines an obtuse angle with respect to the lower edge of the first side panel.

[0008] Optionally, the upper and lower fold lines may be substantially parallel to each other. The upper end lower fold lines may also be substantially perpendicular to the tubular axis of the tubular structure.

[0009] Optionally, the length of the top panel may be substantially less than the length of the bottom panel.

[0010] Optionally, the first side edge of the top panel may be substantially greater in length than the second side edge of the top panel and/or the length of the first side panel may be substantially greater than the length of the second side panel.

[0011] The present invention in another aspect provides a wraparound carrier which includes a top panel, a pair of first and second side panels, a pair of first and second bottom panels and a retention structure. The first and second opposed side panels are hingedly connected to first and second opposed side edges of the top panel respectively. The first and second bottom panels are hingedly connected to the lower edges of the first and second side panels respectively. The bottom panels may be secured together such that a tubular structure is provided by the top, side and bottom panels. The end retention structure is provided for at least one of opposed ends of the tubular structure. The end retention structure includes first and second anchor panels hingedly connected to the end edges of the first and second side panels respectively and disposed in a face-contacting relationship with inside surfaces of the first and second side panels respectively, first and second gusset panels hingedly connected to the first and second anchor panels respectively and extending toward the end edges of the first and second side panels respectively, and article retaining arrangement hingedly connected to the first and second gusset panels for engaging one or more articles packaged in the carrier. The end edge of the first side panel is offset from the end edge of the second side panel such that the end edges lie in distinct imaginary planes each perpendicular to the tubular axis of the tubular structure.

[0012] An optional feature of the second aspect of the invention, provides that the article retaining arrangement may include a single upper end panel hingedly connected to the top panel along the end edge of the top panel. The upper end panel may extend downwardly from the top panel and may interconnect the first and second gusset panels.

[0013] Alternatively, the article retaining arrangement may include a pair of upper end panels hingedly connected to the top panel along the end edge of the top panel and extending downwardly from the top panel.

[0014] Optionally, the end edge of the top panel may be beveled such that the end edge of the top panel defines an acute angle with respect to the first side edge of the top panel.

[0015] Optionally, the article retaining arrangement may include a pair of lower end panels hingedly connected to the first and second bottom panels along their end edges respectively. The lower end panels may extend upwardly from the bottom panels.

[0016] Optionally, the first side edge of the top panel is substantially greater in length than the second side edge of the top panel. Optionally, the length of the first side panel may be substantially greater than the length of the second side panel.

[0017] The present invention in a further aspect provides a package that includes an article group formed of an odd number of similarly dimensioned substantially cylindrical articles and a wraparound article carrier wound around the article group. The articles of the group are disposed on their bottom ends and are arranged in first and second rows such that the first row contains one article more than the second row and such that the articles in the second row are disposed in a nested relationship with the articles in the first row. The wraparound carrier includes a tubular structure and an end retention structure provided for each of the opposed ends of the tubular structure. The tubular structure includes a top panel disposed along the tops of the articles of the group and a pair of first and second opposed side panels disposed alongside the first and second rows respectively. The length of the first side panel is substantially greater than the second side panel length. Each end retention structure includes an anchor panel hingedly connected to the adjacent end edge of the first side panel and disposed in a face-contacting relationship with the inside surfaces of the first side panel, a gusset panel hingedly connected to the anchor panel and extending toward the adjacent end edge of the first side panel, and an end panel hingedly connected to the gusset panel to engage the end article of the first row. The end panel is hingedly connected to the end edge of the top panel and extends downwardly from the top panel.

[0018] In an optional arrangement of the third aspect, the first and second side panels may be hingedly connected to the top panel along first and second opposed side edges of the top panel respectively, and the adjacent end edge of the first side panel may be beveled such that

the adjacent end edge of the first side panel defines an obtuse angle with respect to the first side edge of the top panel.

[0019] Optionally, the first and second side panels are hingedly connected to the top panel along its first and second opposed side edges. The end edge of the top panel may be beveled such that the end edge of the top panel defines an acute angle with respect to the first side edge of the top panel. Optionally, the top panel may be generally trapezoidal in shape.

[0020] Optionally, the article group may have a horizontal cross section that is generally trapezoidal in shape.

[0021] Optionally, one of the first and second side panels is provided with apertures each for receiving part of the adjacent one of the articles in the adjacent one of the first and second rows. Each aperture may be positioned at a location across from a space between two adjacent articles in the other row.

[0022] According to a further aspect, the invention provides a package comprising a wraparound carrier and a plurality of articles disposed in at least two rows within the carrier, the carrier comprising a top wall, first and second side walls and a bottom wall forming a tubular structure sized and dimensioned to tightly wraparound the at least two rows of articles, wherein the number of articles in a first of said rows is one greater than the number of articles in a second of said rows and the carrier being structured such that the articles in the second row nest in-between articles of the first row, the first and second side walls each being dimensioned similarly to the length of the adjacent article row and the top and bottom walls each having a maximum width that is less than the maximum diameter of an article multiplied by the number of rows such that the carrier wraps tightly about the nested group of articles, the articles at the end of the second row of articles being set inwardly of the articles at the end of the first row, the articles at the end of the first row being endmost articles of the carrier and the carrier comprising integrally formed retaining means that retains those endmost articles thereby securing all of the articles within the substantially open-ended tubular carrier.

[0023] According to yet a further aspect, the invention provides a blank, cut and scored to form the carrier mentioned in any preceding paragraph.

Brief Description of the Drawings

[0024]

FIG. 1 is a plan view of a blank for forming the wrap-around carrier of the first embodiment according to the invention;

FIG. 2 is a perspective view of the carrier formed from the blank of FIG. 1;

FIG. 3 is a plan view of a blank for forming the wrap-

around carrier of the second embodiment according to the invention;

FIG. 4 is a top-front perspective view of the carrier formed from the blank of FIG. 3; and

FIG. 5 is a top-rear perspective view of the carrier of FIG. 4.

Detailed Description of the Preferred Embodiments

[0025] FIGS. 1 and 2 illustrate a first embodiment of the present invention, in which FIG. 1 shows a blank 10 from which the wraparound carrier of FIG. 2 is erected. The blank 10 is vertically elongate as viewed in FIG. 1 and is formed, in this embodiment, of paperboard. However the blank may be formed of other foldable sheet material such as corrugated board, plastic or the like. The blank 10 of this embodiment is designed for packaging seven (7) substantially cylindrical articles of an identical configuration, such as plastic beverage bottles. As illustrated in FIG. 1 (wherein the positions of the articles are indicated by the phantom lines), the seven articles B1, B2 are placed on their bottoms and arranged in a two-row group wherein the first row (i.e., the upper row as viewed in FIG. 1) contains four articles B1 and the second row contains three articles B2. The three articles in the second row are placed in a nested or staggered relationship with respect to the four articles in the first row. This results in the article group having a generally trapezoidal horizontal cross section as shown in FIG. 1.

[0026] The blank 10 includes a hexagonal top panel 16 located at the centre of the blank 10. A trapezoidal side panel 18 is connected to the top panel 16 along a fold line 26 and a generally rectangular side panel 14 is connected to the top panel 16 along a fold line 24. A hexagonal bottom panel 12 is connected to the side panel 14 along a fold line 22 while another hexagonal bottom panel 20 is connected to the side panel 18 along a fold line 28.

[0027] The bottom panels 12, 20 can form a composite bottom wall when they are secured together in an overlapping relationship. When the bottom panels 12, 20 are secured, the blank 10 is formed into a tubular structure as shown in FIG. 2. The length of the side panel 18 along the tubular axis X-X of the tubular structure is greater than the length of the side panel 14 along the same tubular axis X-X. Each side panel 14, 18 includes a medial fold line 30, 32 which divides the respective side panel into an upper panel portion and a lower panel portion. The medial fold lines 30, 32 encourage the side panels 14, 18 to fold thereabout so that the side panels 14, 18 are generally conformed to the shape of the articles when the blank is applied around the group of articles B1, B2. The side panel 14 is provided with three sets of top and bottom receiving apertures 34, 36. The top and bottom receiving apertures 34, 36 of each set is provided for receiving the top and bottom parts of the associated ar-

ticle B2 in the second row.

[0028] Referring again to FIG. 1, a series of panels 40a, 44a, 48a, 50a, 52a, 40b, 44b, 48b, 50b, 52b for forming an end retention structure is connected along each of the opposed longitudinal edges of the blank 10. More specifically, the side panel 18 is hingedly connected along its opposed beveled end edges 38a, 38b to the anchor panels 40a and 40b, the top panel 16 is hingedly connected along its opposed end edges 42a, 42b to the upper end panels 44a, 44b and similarly the bottom panel 20 is hingedly connected along its opposed end edges 46a, 46b to the lower end panels 48a, 48b. The end edge 42a of the top panel 16 is offset from the end edge 46a of the bottom panel 20 so that they are not aligned with each other. Similarly, the end edge 42b of the top panel 16 is offset from the end edge 46b of the bottom panel 20 so that they are not aligned with each other. These offset end edge or fold line arrangements are useful to provide a tight package for those articles, such as bottles, each having a top portion having a smaller diameter than its bottom portion. Although the end edges 42a, 46a are offset from each other, they are substantially parallel to each other and are disposed generally perpendicular to the tubular axis X-X. This is also true with respect to the end edges 42b, 46b.

[0029] An upper gusset panel 50a is provided to hingedly interconnect the upper end panel 44a with the anchor panel 40a while the lower gusset panel 52a is provided to hingedly interconnect the lower end panel 48a with the anchor panel 40a. The upper and lower gusset panels 50b, 52b serve similarly to the upper and lower gusset panels 50a, 52a to connect the associated anchor and end panels 40b, 44b, 48b together. Reference numerals 54a, 56a, 58a, 60a, 54b, 56b, 58b and 60b designate fold lines. The medial fold line 32 extends into the anchor panels 40a, 40b to encourage the anchor panels 40a, 40b to fold thereabout so that the anchor panels 40a, 40b are generally conformed to the shape of the articles when the blank 10 is erected around the group of the articles. Openings 62a, 64a, 62b, 64b are provided to facilitate the folding process in which the panels 40a, 44a, 48a, 50a, 52a, 40b, 44b, 48b, 50b, 52b are involved.

[0030] Turning to the process for erecting the blank 10 into a carrier, it is envisaged that the carrier can be erected by a series of sequential folding and gluing operations in a straight line machine so that the carrier 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.

[0031] First, the blank 10 in a flat, unfolded condition is lowered to place the top panel 16 onto the tops of the articles B1, B2 of an assembled two-row group. Then, the side panels 14, 18 are folded downwardly about their respective fold lines 24, 26 toward the group of articles. Before the side panel 18 is fully folded to contact the articles in the first row, the anchor panels 40a, 40b are folded about the fold lines 38a, 38b into flat face contact-

ing relationship with the inside surface of the side panel 18. By this means, the upper end panels 44a, 44b are urged to fold almost ninety (90) degrees downwardly about the fold lines 42a, 42b whereas the lower end panels 48a, 48b are urged to fold beyond ninety (90) degrees inwardly about fold lines 46a, 46b. During this folding step, each upper gusset panel 50a, 50b is folded automatically about the fold lines 54a, 56a, 54b, 56b to control the downward folding movement of the adjacent upper end panel 44a, 44b to eventually place itself at an operative position wherein that upper gusset panel 50a, 50b lies in flat face contacting relationship with the adjacent anchor panel 40a, 40b. At the same time, each lower gusset panel 52a, 52b automatically starts its folding movement about the fold lines 58a, 60a, 58b, 60b to control the inward folding movement of the adjacent lower end panel 48a, 48b to place itself at a position wherein that lower gusset panel 52a, 52b extends between the folded anchor panel 40a, 40b and the folded lower end panel 48a, 48b.

[0032] After the anchor panels 40a, 40b are fully folded but before the side panel 18 contacts the articles in the first row, the bottom panel 20 is folded approximately ninety (90) degrees inwardly about the fold line 28. This causes the lower gusset panels 52a, 52b to further fold about the fold lines 58a, 60a, 58b, 60b to bring themselves into face contacting relationship with the folded anchor panels 40a, 40b respectively and also cause the lower end panels 48a, 48b to somewhat fold outwardly about the fold lines 46a, 46b so that the lower end panels 48a, 48b take their respective operative positions where they each define a generally 90° or right angle with respect to the bottom panel 20. After that, both the side panels 18, 14 are further folded until they are pressed against the articles of the first and second rows B1, B2 respectively. At this stage, each anchor panel 40a, 40b is tucked between the adjacent article B1 and the side panel 18 so that the upper 44a, 44b and lower 48a, 48b end panels are locked in their respective folded positions. (See FIG 2). Glue is then applied to either the inside surface of the bottom panel 12 or the outside surface of the bottom panel 20 proximate its free edge. The bottom panel 12 is folded approximately ninety (90) degrees about the fold line 22 to overlap the outside surface of the bottom panel 20. This secures the bottom panels 12, 20 together and converts them into a single substantially hexagonal composite bottom wall that is shaped similarly to the top panel 16. The secured bottom panels 12, 20 allow the carrier 70 to be fully erected as shown in FIG. 2.

[0033] In the erected carrier 70, the upper 44a, 44b and lower 48a, 48b end panels serve to partially close each of the opposite ends of the tubular carrier. These end panels 44a, 44b, 48a, 48b are in engagement with the end articles B1 in the first row so that undesired exit of the first row articles B1 from the carrier is prevented. The three articles B2 of the second row are prevented from dislodging from the carrier because they are nested with the articles B1 of the first row and urged in the nested

position by the blank 10 that has been disposed tightly around the article group. The articles B2 in the second row are retained in the carrier also by engagement with the apertures 34, 36 as shown in FIG. 2. The end edge 42a of the top panel 16 is offset from the end edge 46a of the bottom panel 20 such that these end edges 42a, 46a lie in distinct imaginary vertical planes. In like manner, the end edge 42b of the top panel 16 is offset from the end edge 46b of the bottom panel 20 such that these end edges 42b, 46b line in distinct imaginary vertical planes. As mentioned earlier, these offset end edge arrangements whilst optional are useful to provide a tight package for those articles each having a top portion of a smaller diameter than its bottom portion.

[0034] Referring to FIG. 1, the end edge 38a of the side panel 18 is beveled such that the end edge 38a defines an obtuse angle with respect to the fold line 26. Similarly, the end edge 38b of the side panel 18 is beveled such that the end edge 38b defines an obtuse angle with respect to the fold line 26. Alternatively, each end edge 38a, 38b of the side panel 18 may be beveled in such a manner that that the end edge defines an obtuse angle with respect to the fold line 28.

[0035] Such an arrangement would be useful when each packaged article has a top portion greater in diameter than its bottom portion.

[0036] The glue used to secure the bottom panels 12, 20 may be replaced by known mechanical locks. It will be apparent for those skilled in the art that a mechanical lock is formed of a pair of male and female elements provided respectively for two panels to be interconnected.

[0037] The anchor panels 40a, 40b may be pre-folded onto the side panel 18 or even pre-glued to the side panel 18 to facilitate erecting process of the carrier. Such a facilitated erecting process employing a pre-folded/pre-glued anchor panel is disclosed in US Patent No. 7,222,777 which is hereby incorporated by reference.

[0038] FIGS. 3 to 5 illustrate a second embodiment of the present invention. Like reference numerals have been used for the like parts of the first embodiment albeit, the reference numerals have been raised by '100' to distinguish them from the first embodiment. The second embodiment is similar to the first embodiment and therefore only the differences from the first embodiment are described in any greater detail. FIG. 3 shows a blank 110 from which the wraparound carrier of FIGS. 4 and 5 is erected. The blank 110 of FIG. 3 differs from the blank 10 of FIG.1 in that the side panel 114 is hingedly connected along its opposed end edges 172a, 172b respectively to another pair of anchor panels 174a, 174b. The medial fold line 130 of the side panel 114 extends into both the anchor panels 174a, 174b to encourage them to fold thereabout along with the side panel 114. No article receiving apertures are provided for the side panel 114. The blank 110 also differs from the blank 10 in that the upper end panels 144a, 144b have been elongated to extend entirely along the top panel end edges 142a, 142b

respectively. Another pair of upper gusset panels 176a, 176b hingedly interconnect the elongate upper end panels 144a, 144b with the anchor panels 174a, 174b respectively so that each upper end panel 144a, 144b extends all the way between the adjacent upper gusset panels 150a, 176a; 150b, 176b. The top panel 116 is generally trapezoidal in shape and thus each end edge 142a, 142b of the top panel 166 beveled or angled such that it defines an acute angle with respect to the fold line 126. The blank 110 further differs from the blank 100 in that the side panel 118 is provided with a lower fold line 178 as well as four pairs of upper 134 and lower 136 receiving apertures. The lower fold line 178 defines a heel strip along the lower edge of the side panel 118. Each pair of the upper 134 and lower 136 receiving apertures is designed to receive the top and bottom portions of the adjacent article B1 in the first row respectively, which is best shown in FIG. 5. Each lower receiving aperture 136 is provided with a pair of engaging flaps 180 and 182. Each of these engaging flaps 180, 182 are hingedly connected to the perimeter of the associated lower aperture 136 so that they may be folded inwardly of the carrier to engage and support the bottom of an adjacent article B1. These bottom engaging flaps are well known in the art and disclosed in US Patent No. 5,595,299 which is hereby incorporated by reference.

[0039] The blank 110 may be erected into a tubular carrier 170 shown in FIGS. 4 and 5 through a folding and gluing process similar to that described for the first embodiment. However, the erecting process for the blank 110 may be somewhat simpler than that for the blank 10 because the blank 110 employs no lower end panel and no associated lower gusset panel. The lower end panel and lower gusset panels 48a, 48b, 52a, 52b provide a retaining means for the end most articles B1 at each end of the carton 70. In the second illustrated embodiment, alternative retaining means is provided for the end most articles by the provision of lower receiving apertures 136 and engaging flaps 180, 182. It is envisaged that in other embodiments of the invention, other retaining means is provided for the end most articles of the first row (i.e. row containing most articles). Such end most article retaining means need not be provided for the articles at each end of the second (i.e. nested row) of articles B2 since they are held sufficiently securely by virtue of being nested between articles of the first row and/or by virtue of being set inwardly of the carton compared to the end most articles of the first row B1.

[0040] Referring again to FIG. 3, the end edge 138a of the longer side panel 118 is offset from the end edge 172a of the shorter side panel so that they are not aligned with each other. The same is true with respect to the end edges 138b, 172b. Although being offset, the end edges 138a, 172a; 138b, 172b of the side panels 118, 114 are substantially parallel to one another and generally perpendicular to the fold lines 124, 126. This relationship is maintained even after the blank 110 is erected into the carrier 170 wherein the offset end edges 138a, 172a,

138b, 172b lie in distinct imaginary planes each perpendicular to the tubular axis X-X of the tubular carrier 170.

[0041] In place of each upper end panel 144a, 144b, the carrier 170 may be provided with a pair of upper end panels. Such a pair of upper end panels may be easily envisaged by splitting each upper end panel 144a, 144b into two separate portions by means of a vertical slit, slot or cutout. In place of, or in addition to, the upper end panels 144a, 144b, the carrier 170 may be provided with a pair of lower end panels at each end of the tubular carrier 170. Such lower end panels may be hingedly connected to the bottom panels 112, 120 along their adjacent end edges respectively and may extend upwardly from the bottom panels.

[0042] Although the invention has been described in connection with article carriers each designed to hold seven plastic beverage bottles, other carriers of the invention may be designed to hold more or less than seven articles and can be utilized with articles of various sizes, shapes and kinds. For example, a five-article carrier of the invention may have three articles in the first row and two articles in the second row such that the two articles in the second row is nested with the three articles in the first row. A nine-article carrier of the invention may have five articles in the first row and four articles in the second row. In a similar way, three-, eleven-, thirteen-, fifteen-article carriers may be designed and constructed in accordance with the invention. If the articles to be packaged have necks or are otherwise shaped so as to extend through the top panel, neck-receiving openings may be provided for the top panel so that the necks or similar upper portions may be outwardly protruded through such top panel openings.

[0043] Furthermore, though the exemplary embodiments show a carrier having two rows of articles, in other envisaged embodiments, the carrier comprises three or more rows of articles. For example two outer rows each comprising four articles and a single central row comprising three articles each being nested between the articles in the outer rows. In such an arrangement some means for securely retaining the outer end articles would be provided, for example upper and lower end panels as in the first illustrated embodiment and/or heel apertures 36, 136 and/or engaging flaps 180, 182 as in the second illustrated embodiment. It will be understood that in such an arrangement each side panel maybe of similar length. In this optional arrangement of more than two rows, the overall number of articles maybe even.

[0044] It will also be recognized that as used herein, the terms "top", "bottom" and "side" with respect to the panels of the carrier or carrier blank are relative terms, and that the carrier may be re-oriented as necessary or as desired.

[0045] Any reference to hinged connection should not be construed as necessarily referring to a single fold line only; indeed it is envisaged that hinged connection can be formed from one or more of the following, a short slit, a frangible line or a fold line without departing from the

scope of the invention.

Claims

1. A package comprising a wraparound carrier (70) and a plurality of articles disposed in at least two rows (B1, B2) within the carrier, the carrier comprising a top wall (16; 116), first and second side walls (14, 18; 114, 118) and a bottom wall (12/20; 112/120) forming a tubular structure sized and dimensioned to tightly wraparound the at least two rows of articles (B1, B2), wherein the number of articles in a first (B1) of said rows is one greater than the number of articles in a second (B2) of said rows and the carrier being structured such that the articles in the second row nest in-between articles of the first row, the first and second side walls (14, 18; 114, 118) each being dimensioned similarly to the length of the adjacent article row (B2, B1) and the top and bottom walls each having a maximum width that is less than the maximum diameter of an article multiplied by the number of rows such that the carrier wraps tightly about the nested group of articles, the articles at the end of the second row of articles being set inwardly of the articles at the end of the first row, the articles at the end of the first row being endmost articles of the carrier and the carrier comprising integrally formed retaining means that retains those endmost articles thereby securing all of the articles within the substantially open-ended tubular carrier.
2. A package according to claim 1 comprising:
 - an article group formed of an odd number of similarly dimensioned substantially cylindrical articles disposed on bottoms end thereof, the articles being arranged in first and second rows (B1, B2) such that the first row (B1) contains one article more than the second row (B2) and such that the articles in the second row are disposed in a nested relationship with the articles in the first row; and a wraparound carrier disposed around the group to package the group therein, the carrier comprising a tubular structure and an end retention structure provided for each of opposed ends of the tubular structure to prevent undesired exit of the articles from the carrier, the tubular structure comprising a top panel (16; 116) disposed along tops of the articles of the group and a pair of first and second opposed side panels (18, 14; 118, 114) disposed alongside the first and second rows (B1, B2) respectively, the first side panel (18; 118) having a first side panel length along a tubular axis of the tubular structure, the second side panel (14; 114) having a second side panel length along the tubular axis, the first side panel length being substantially greater than the second side panel length, each of the end retention structures comprising an anchor panel (40b; 140b) hingedly connected to an adjacent end edge (38b; 138b) of the first side panel (18; 118) and disposed in a face-contacting relationship with an inside surface of the first side panel (18; 118), a gusset panel (50b; 150b) hingedly connected to the anchor panel (40b; 140b) and extending toward the adjacent end edge of the first side panel, and an end panel (44b; 144b) hingedly connected to the gusset panel (50b; 150b) to engage an end article of the first row (B1), the end panel being hingedly connected to an end edge (42b; 142b) of the top panel (16; 116) and extending downwardly from the top panel.
3. The package according to claim 1 or 2 wherein the first and second side panels (18, 14; 118, 114) are hingedly connected to the top panel along first and second opposed side edges (26, 24; 126, 124) of the top panel respectively, and the adjacent end edge (38b; 138b) of the first side panel is beveled such that the adjacent end edge of the first side panel defines an obtuse angle with respect to the first side edge (26; 126) of the top panel.
4. The package according to claim 1 or 2 wherein the first and second side panels (18, 14; 118, 114) are hingedly connected to the top panel along first and second opposed side edges (26, 24; 126, 124) of the top panel respectively, and the end edge (42b; 142b) of the top panel is beveled such that the end edge of the top panel defines an acute angle with respect to the first side edge (26; 126) of the top panel.
5. The package according to any claim 1 to 4 wherein the top panel is generally trapezoidal in shape and/or wherein the article group has a horizontal cross section that is generally trapezoidal in shape.
6. The package according to any claim 1 to 5 wherein one of the first and second side panels (18, 14; 118, 114) is provided with apertures (34, 134, 136) each for receiving part of an adjacent one of the articles in an adjacent one of the first and second rows (B1, B2), each of the apertures being positioned at a location across from a space between two adjacent articles in the other row.
7. A wraparound carrier for use in a package according to any of claims 1 to 6 comprising:
 - a top panel (16) having a pair of first and second opposed side edges (24; 26);
 - a pair of first and second opposed side panels (14, 18) hingedly connected to the first and second

ond side edges (24, 26) of the top panel (16) respectively, the first side panel (18) having an end edge (38b);

a pair of first and second bottom panels (12, 20) hingedly connected to lower edges (28, 22) of the first and second side panels (14, 18) respectively, the bottom panels (12, 20) being secured together such that a tubular structure is provided by the top, side and bottom panels; and an end retention structure provided for at least one of opposed ends of the tubular structure, the end retention structure including an anchor panel (40b) hingedly connected to the end edge (38b) of the first side panel (18) and disposed in a face-contacting relationship with an inside surface of the first side panel, upper and lower gusset panels (52b, 50b) hingedly connected to the anchor panel (40b) and extending toward the end edge of the first side panel, and upper and lower end panels (44b, 48b) hingedly connected to the upper and lower gusset panels (50b, 52b) respectively, the upper end panel (44b) being hingedly connected to the top panel (16) along an upper fold line (42b) and extending downwardly from the top panel, the lower end panel (48b) being hingedly connected to the first bottom panel (20) along a lower fold line (46b) and extending upwardly from the first bottom panel, the upper and lower fold lines (42b, 46b) being offset from each other such that the upper and lower fold lines lie in distinct imaginary vertical planes.

8. A wraparound carrier for use in a package according to any of claims 1 to 6 comprising:

a top panel (116) having a pair of first and second opposed side edges (126, 128);

a pair of first and second opposed side panels (118, 114) hingedly connected to the first and second side edges of the top panel respectively, each of the first and second side panels having an end edge (138b, 172b);

a pair of first and second bottom panels (112, 120) hingedly connected to lower edges (128, 122) of the first and second side panels respectively, the bottom panels being secured together such that a tubular structure is provided by the top, side and bottom panels; and an end retention structure provided for at least one of opposed ends of the tubular structure, the end retention structure including first and second anchor panels (140b, 174b) hingedly connected to the end edges (138b, 172b) of the first and second side panels (118, 114) respectively, the first and second anchor panels (140b, 174b) being disposed in a face-contacting relationship with inside surfaces of the first and second side pan-

els (118, 114) respectively, first and second gusset panels (150b, 176b) hingedly connected to the first and second anchor panels (140b, 174b) respectively and extending toward the end edges of the first and second side panels respectively, and article retaining means hingedly connected to the first and second gusset panels (130b, 176b) for engaging one or more articles packaged in the carrier to prevent undesired exit of the one or more articles from the carrier, the end edge (138b) of the first side panel (118) being offset from the end edge (172b) of the second side panel (114) such that the end edges lie in distinct imaginary planes each perpendicular to a tubular axis of the tubular structure.

9. The carrier according to claim 7 wherein the end edge (38b) of the first side panel (18) is beveled such that the end edge defines an obtuse angle with respect to the first side edge (26) of the top panel (16) or wherein the end edge (38b) of the first side panel (18) is beveled such that the end edge defines an obtuse angle with respect to the lower edge (28) of the first side panel (18).
10. The carrier according to any preceding claim 7 or 9 wherein the upper and lower fold lines (42b, 46b) are substantially parallel to each other and/or wherein the upper and lower fold lines (42b, 46b) are substantially perpendicular to a tubular axis of the tubular structure.
11. The carrier according to any of claims 7 to 10, wherein the top panel (16) has a top panel length along a tubular axis of the tubular structure, the first bottom panel (20) has a bottom panel length along the tubular axis, and the top panel length is substantially less than the bottom panel length.
12. The carrier according to any claim 7 to 11 wherein the article retaining means comprises a pair of lower end panels hingedly connected to the first and second bottom panels (112, 120) along end edges of the bottom panels respectively, the lower end panels extending upwardly from the bottom panels.
13. The carrier according to claim 8 wherein the article retaining means comprises a single upper end panel (144b) or a pair of upper end panels hingedly connected to the top panel (116) along an end edge (142b) of the top panel, the or each upper end panel (144b) extending downwardly from the top panel.
14. The carrier according to any preceding claim 7 to 13 wherein the first side edge (26; 126) of the top panel is substantially greater in length than the second side edge (24; 124) of the top panel.

15. The carrier according to any preceding claim 7 to 13 wherein the first side panel (18; 118) has a first side panel length along a tubular axis of the tubular structure, the second side panel (14; 114) has a second side panel length along the tubular axis, and the first side panel length is substantially greater than the second side panel length.

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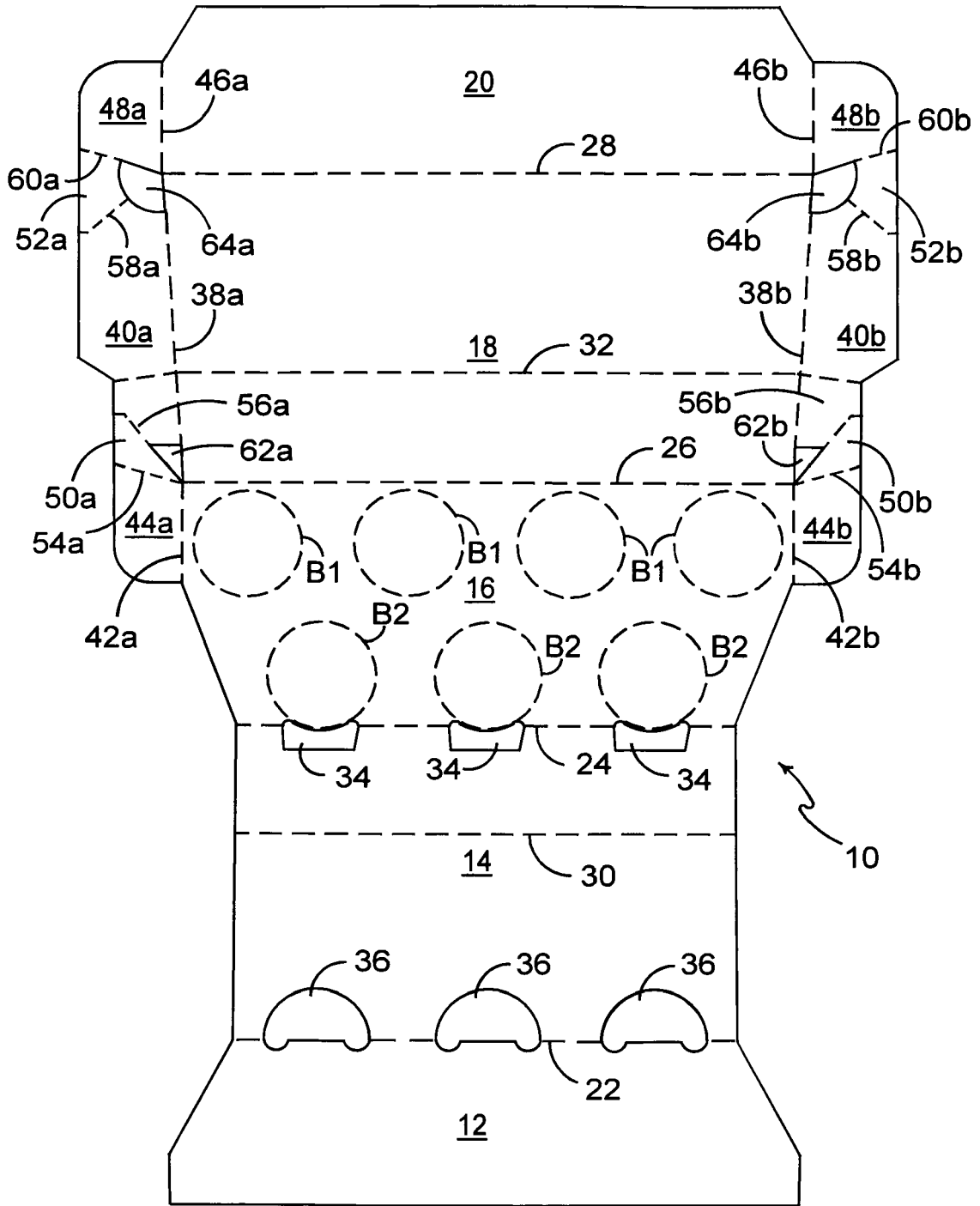


FIGURE 1

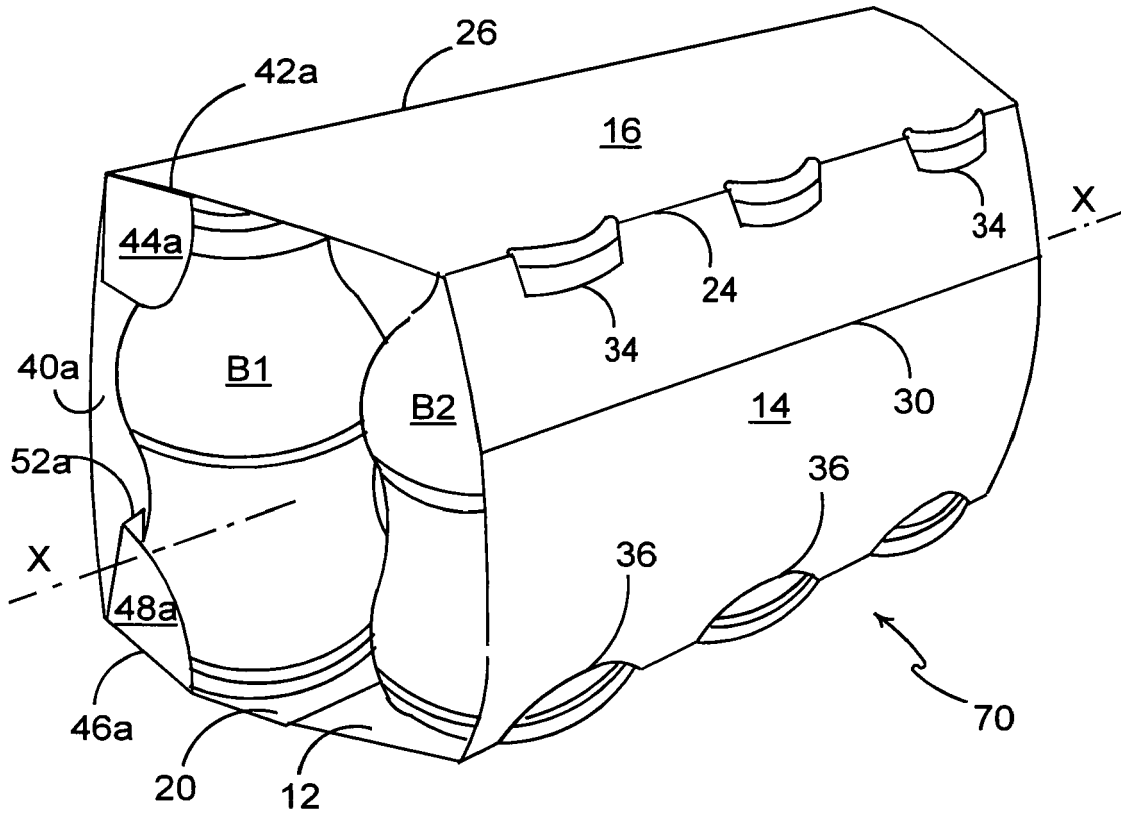


FIGURE 2

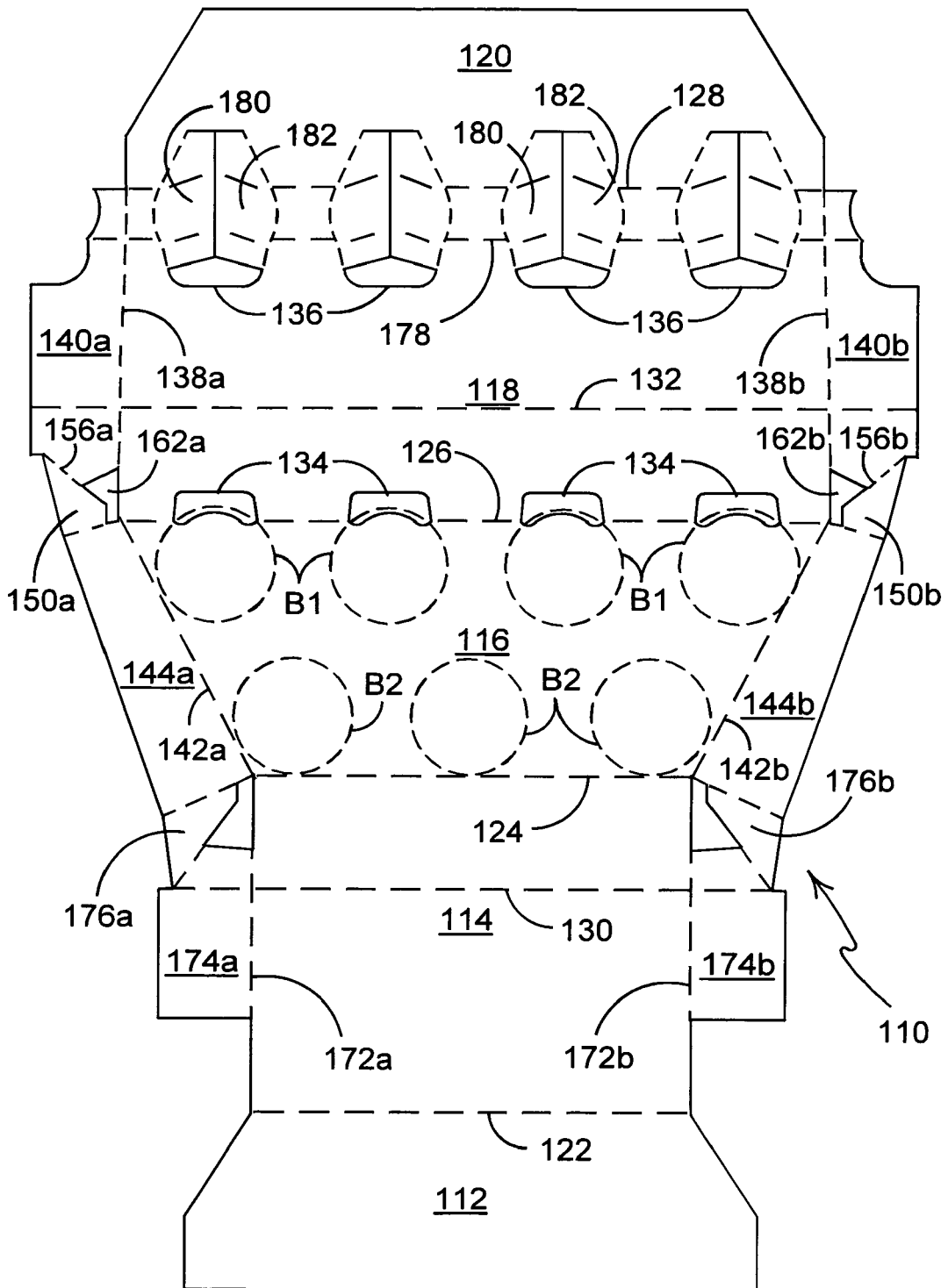


FIGURE 3

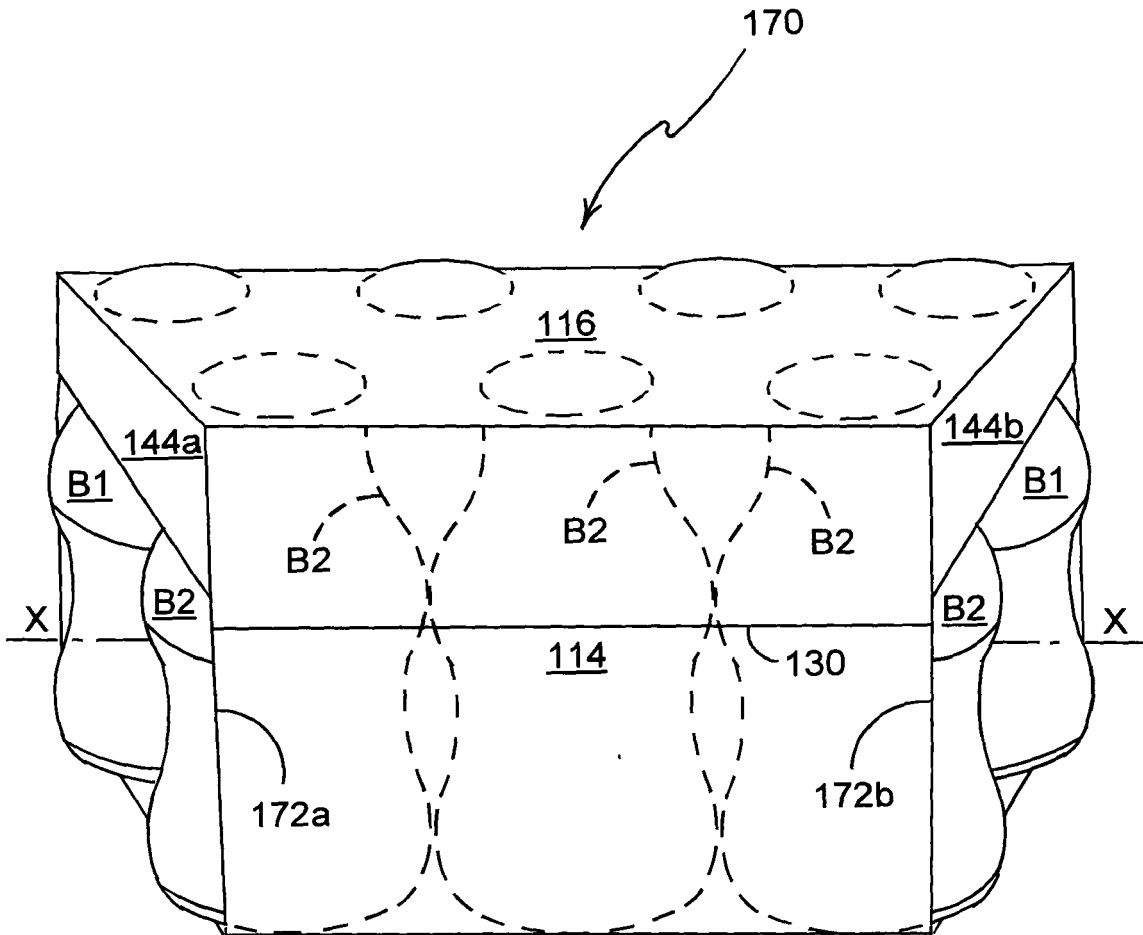


FIGURE 4

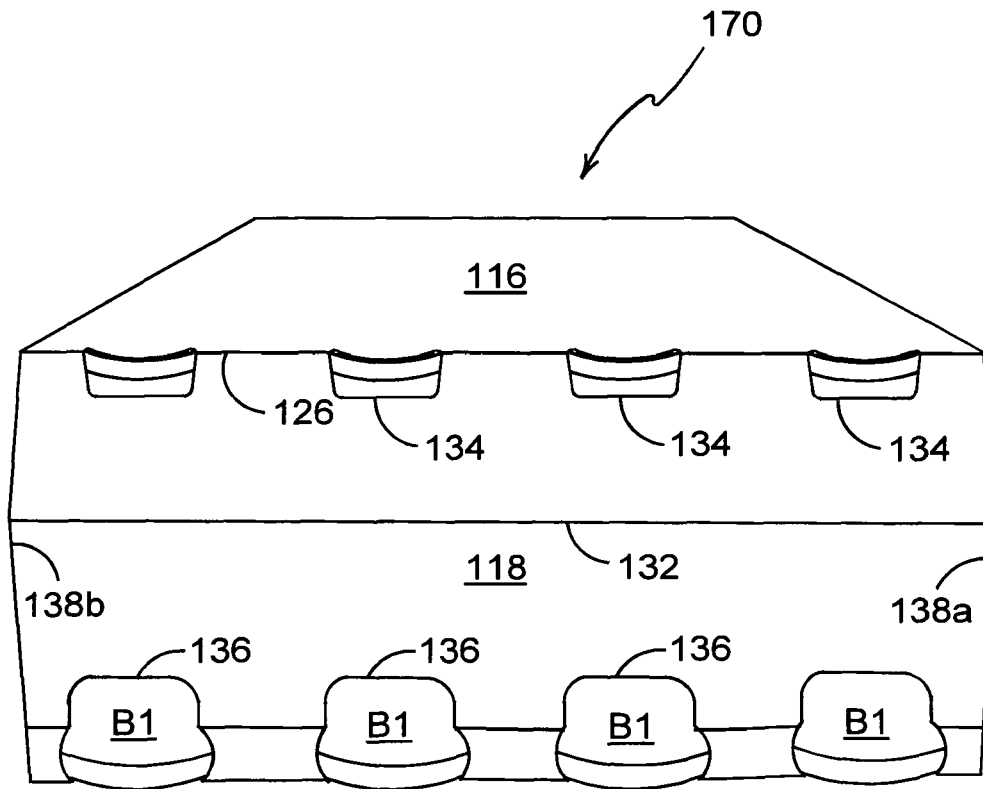


FIGURE 5



EUROPEAN SEARCH REPORT

Application Number
EP 09 00 2822

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A	US 5 558 224 A (FOGLE JAMES C [US]) 24 September 1996 (1996-09-24) * column 2, line 26 - line 54; figures 1-7 *	1-15	INV. B65D71/18 B65D71/20
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
Place of search		Date of completion of the search	Examiner
Munich		27 May 2009	Derrien, Yannick
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p> <p>----- & : member of the same patent family, corresponding document</p>			

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EP 09 00 2822

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27-05-2009

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