(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
24 June 2021 (24.06.2021)

WIPO | PCT

(10) International Publication Number
WO 2021/126914 A1

(51) International Patent Classification:
B65D 71/14 (2006.01) *B65D 5/42* (2006.01)
B65D 71/36 (2006.01)

(21) International Application Number:
PCT/US2020/065224

(22) International Filing Date:
16 December 2020 (16.12.2020)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/948,471 16 December 2019 (16.12.2019) US

(71) Applicant: **WESTROCK PACKAGING SYSTEMS, LLC** [US/US]; 1000 Abernathy Road, NE, Atlanta, GA 30328 (US).

(72) Inventor: **ZACHERLE, Matthew, E.**; 1148 Joliette Road, Chesterfield, VA 23235 (US).

(74) Agent: **GOLDBERG, Brian, J.** et al.; Westrock Packaging Systems, LLC, 1000 Abernathy Road, NE, Atlanta, GA 30328 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report (Art. 21(3))*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(54) Title: CARTON AND BLANK THEREFOR

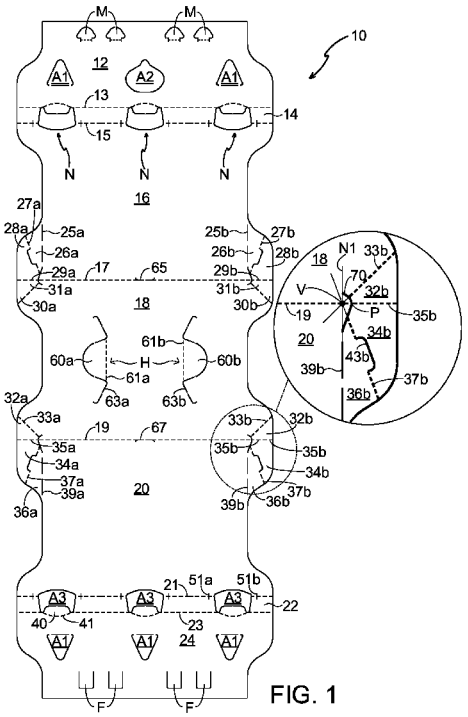


FIG. 1

(57) Abstract: Aspects of the disclosure relate to a carton for packaging one or more article and a blank for forming the carton. An aspect of the invention provides a corner folding arrangement comprising a first panel (18) having a corner defined by an end edge and a side edge. A second panel (32b) is hingedly connected to the end edge of the first panel along a first fold line. A third panel (20) hingedly connected to the side edge of the first panel along a second fold line. A fourth (34b) and fifth (36b) panel couple the second panel to the third panel. The fourth panel is hingedly connected to the second panel along a third fold line and the fifth panel is hingedly connected to the third panel along a fourth fold line. A severance line (70) extends between the first and fourth fold lines or between the second and third fold lines. In an unfolded blank form the severance line bypasses a notional intersection of the first and second fold lines such that the notional intersection is located on one side of the severance line spaced apart from the fourth and fifth panels.

WO 2021/126914 A1

CARTON AND BLANK THEREFOR

CROSS REFERENCE TO RELATED APPLICATION

This application claims the benefit of U.S. Provisional Patent Application No. 62/948,471 filed December 16, 2019. The disclosure of which is herein incorporated by reference in its entirety.

TECHNICAL FIELD

The present invention relates to cartons or carriers and to blanks for forming the same. More specifically, but not exclusively, the invention relates to a corner folding structure and a carrier comprising the same.

BACKGROUND

In the field of packaging it is known to provide cartons for carrying multiple articles. Cartons are well known in the art and are useful for enabling consumers to transport, store and access a group of articles for consumption. For cost and environmental considerations, such cartons or carriers need to be formed from as little material as possible and cause as little wastage in the materials from which they are formed as possible. Further considerations are the strength of the carton and its suitability for holding and transporting large weights of articles. It is desirable that the contents of the carton are secure within the carton.

It is an object of the present disclosure to provide an article carrier having improved machine handling characteristics.

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

SUMMARY

An aspect of the invention provides a corner folding arrangement comprising a first panel, second panel and a third panel. The first panel has a corner defined by an end edge and a side edge. The second panel may be hingedly connected to the end edge of the first panel along a

first fold line. The third panel may be hingedly connected to the side edge of the first panel along a second fold line. A fourth panel and a fifth panel hinged thereto may couple the second panel to the third panel. The fourth panel is hingedly connected to the second panel along a third fold line. The fifth panel is hingedly connected to the third panel along a fourth fold line. A severance line extends between the first and fourth fold lines or between the second and third fold lines. In an unfolded blank form the severance line bypasses a notional intersection of the first and second fold lines such that the notional intersection is located on one side of the severance line spaced apart from the fourth and fifth panels.

Another aspect of the invention provides a carton for packaging one or more articles comprising a plurality of panels forming walls of a tubular structure having an interior. The plurality of panels includes a first panel, second panel and a third panel. The first panel has a corner defined by an end edge and a side edge. The second panel may be hingedly connected to the end edge of the first panel along a first fold line. The third panel may be hingedly connected to the side edge of the first panel along a second fold line. A fourth panel and a fifth panel hinged thereto couple the second panel to the third panel. The fourth panel is hingedly connected to the second panel along a third fold line. The fifth panel is hingedly connected to the third panel along a fourth fold line. The fourth and fifth panels may be disposed in the interior of the carton. A severance line extends between the first and fourth fold lines or between the second and third fold lines. In an unfolded blank form the severance line bypasses a notional intersection of the first and second fold lines such that the notional intersection is located on one side of the severance line spaced apart from the fourth and fifth panels.

A further aspect of the invention provides a carton for packaging one or more articles comprising a plurality of panels forming walls of a tubular structure having an interior. The carton comprises:

a first wall having an end edge and a side edge adjacent the end edge;

a second wall hingedly connected to the end edge of the first wall along a first fold line; and

a third wall hingedly connected to the side edge of the first wall along a second fold line.

A severance line extends at least between the first and second fold lines. The severance line is divergently arranged with respect to one of the first or second fold lines so as to define, at least

in part, a projection integral with the first wall, said projection extending outwardly from said one of the first or second fold lines.

Optionally, the carton comprises a pair of gusset panels hingedly connected to each other by a fifth fold line, the pair of gusset panels coupling the second wall to the third wall, the pair of gusset panels being disposed in the interior of the carton.

Optionally, the carton comprises a first gusset panel hingedly connected to a side edge of the second wall along a third fold line, a portion of the severance line extends at least between the first and third fold lines said portion of the severance line being divergently arranged with respect to the third fold line so as to define, at least in part, a projection integral with the second wall and extending outwardly from the third fold line.

Optionally, the carton comprises a second gusset panel hingedly connected to an end edge of the third wall along a fourth fold line, a portion of the severance line extends at least between the fourth and second fold lines said portion of the severance line being divergently arranged with respect to the fourth fold line so as to define, at least in part, a projection integral with the third wall and extending outwardly from the fourth fold line.

Yet another aspect of the invention provides a blank for forming a carton, the blank comprising plurality of panels forming walls of a tubular structure defining an interior, the plurality of panels includes a first panel, second panel and a third panel. The first panel has a corner defined by an end edge and a side edge. The second panel may be hingedly connected to the end edge of the first panel along a first fold line. The third panel may be hingedly connected to the side edge of the first panel along a second fold line. A fourth panel and a fifth panel hinged thereto couple the second panel to the third panel. The fourth panel is hingedly connected to the second panel along a third fold line. The fifth panel is hingedly connected to the third panel along a fourth fold line. The fourth and fifth panels may be disposed in the interior of an erected carton. A severance line extends between the first and fourth fold lines or between the second and third fold lines. In an unfolded blank form the severance line bypasses a notional intersection of the first and second fold lines such that the notional intersection is located on one side of the severance line spaced apart from the fourth and fifth panels.

Still yet another aspect of the invention provides a blank for forming a carton. The blank comprises a first panel having a corner defined by an end edge and a side edge. An end flap is hingedly connected to the end edge of the first panel along a first fold line for at least partially closing an end of the carton. A side panel is hingedly connected to the side edge of the first panel along a second fold line. A pair of first and second hinged gusset panels extend between the end flap and the side panel for placement under one of the end flap and the side panel when the carton is erected. The first gusset panel is hingedly connected to the end flap along a third fold line and the second gusset panel is hingedly connected to the side panel along a fourth fold line. A severance line extends between the first and fourth fold lines or between the second and third fold lines. The severance line bypasses a notional intersection of the first and second fold lines such that the notional intersection is located on one side of the severance line spaced apart from the first and second gusset panels.

Still yet a further aspect of the invention provides a blank for forming a carton. The blank comprises a first panel having a corner defined by an end edge and a side edge. An end flap is hingedly connected to the end edge of the first panel along a first fold line for at least partially closing an end of the carton. A side panel is hingedly connected to the side edge of the first panel along a second fold line. A pair of first and second hinged gusset panels extend between the end flap and the side panel for placement under one of the end flap and the side panel when the carton is erected. The first gusset panel is hingedly connected to the end flap along a third fold line and the second gusset panel is hingedly connected to the side panel along a fourth fold line. A severance line extends between the first and fourth fold lines or between the second and third fold lines. The severance line intersects with at least the third or fourth fold line at a first intersection such that the first intersection is disposed at a position closer to the first gusset panel than a notional intersection of the first and second fold lines.

Optionally, the severance line is linear.

Optionally, the severance line is non-linear. Optionally, the severance line is curvilinear. Optionally, the severance line is arcuate. Optionally, the severance line comprises at least two sections arranged divergently with respect to each other. Optionally, the severance line comprises at least two contiguous sections arranged divergently with respect to each other.

Optionally, the end flap comprises one or more additional fold lines. Optionally, the first panel comprises one or more additional fold lines.

Optionally, the severance line extends into the first panel. Optionally, the first panel is a top or base panel.

Optionally, the severance line extends into the side panel. Optionally, the severance line extends into the end flap.

Optionally, the severance line is convex when viewed from the first gusset panel. Optionally, the severance line is concave when viewed from the first gusset panel.

Optionally, the second gusset panel forms an anchoring panel.

Within the scope of this application it is envisaged or intended 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 considered or taken independently or in any combination thereof.

Features or elements described in connection with, or relation to, one embodiment are applicable to all embodiments unless there is an incompatibility of features. One or more features or elements from one embodiment may be incorporated into, or combined with, any of the other embodiments disclosed herein, said features or elements extracted from said one embodiment may be included in addition to, or in replacement of one or more features or elements of said other embodiment.

A feature, or combination of features, of an embodiment disclosed herein may be extracted in isolation from other features of that embodiment. Alternatively, a feature, or combination of features, of an embodiment may be omitted from that embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

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 blank for forming a carton according to a first embodiment;

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

Figure 3 is a plan view from above of a blank for forming a carton according to a second embodiment;

Figure 3B is an enlarged view of a portion of the blank of Figure 3;

Figure 4 is a perspective view from above of a portion of a partially assembled carton formed from the blank of Figure 3;

Figure 5 is a perspective view from above of a portion of a carton formed from the blank of Figure 3;

Figure 6 is a plan view from above of a blank for forming a carton according to a third embodiment;

Figure 6B is an enlarged view of a portion of the blank of Figure 6;

Figure 7 is a perspective view from above of a portion of a partially assembled carton formed from the blank of Figure 6;

Figure 8 is a perspective view from above of a portion of a carton formed from the blank of Figure 6;

Figure 9 is a plan view from above of a blank for forming a carton according to a fourth embodiment;

Figure 10 is a plan view from above of a blank for forming a carton according to a fifth embodiment;

Figure 10B is an enlarged view of a portion of the blank of Figure 10;

Figure 10C is a plan view from above of a portion of a blank for forming a carton according to a sixth embodiment;

Figure 11 is a plan view from above of a blank for forming a carton according to a seventh embodiment;

Figure 12 is a plan view from above of a portion of a blank for forming a carton according to an eighth embodiment;

Figure 13A and 13B are perspective views from above of portions of a carrier formed from the blank of Figure 9;

Figure 14 is a perspective view from above of a portion of a carton formed from the blank of Figure 10A;

Figure 15A and 15B are perspective views from above of portions of a carrier formed from the blank of Figure 11;

Figure 16 is a plan view from above of a portion of a blank for forming a carton according to a ninth embodiment; and

Figure 17 is a plan view from above of a portion of a blank for forming a carton according to a tenth embodiment.

DETAILED DESCRIPTION OF EMBODIMENTS

Detailed descriptions of specific embodiments of the package, blanks and cartons 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 cartons 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.

Referring to Figure 1, there is shown a plan view of a blank 10 capable of forming a carton or carrier 90, as shown in Figure 2, for containing and carrying a group of primary products such as, but not limited to, bottles or cans, hereinafter referred to as articles B, as shown in Figure 2. The blank 10 forms a secondary package for packaging at least one primary product container or package.

Referring to Figure 3, there is shown a plan view of a blank 110 capable of forming a carton or carrier 190, as shown in Figures 4 and 5, for containing and carrying a group of primary products.

Referring to Figure 6, there is shown a plan view of a blank 210 capable of forming a carton or carrier 290, as shown in Figures 7 and 8, for containing and carrying a group of primary products.

Referring to Figures 9, 10, 10C, 11, 12 and 17 there are shown plan views of blanks 310; 410; 510; 610; 710; 810 capable of forming a carton or carrier 390; 490; 690, as shown in Figures 13A, 13B, 14, 15A and 15B, for containing and carrying a group of primary products.

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 90; 190; 290; 390; 490; 690 for engaging and carrying articles B, such as primary product containers B. It is contemplated that the teachings of the invention can be applied to various product containers B, which may or may not be tapered and/or cylindrical. Exemplary containers include bottles B (for example metallic, glass or plastics bottles), cans (for example aluminium cans), tins, pouches, packets and the like.

The blanks 10; 110; 210; 310; 410; 510; 610; 710; 810 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. It should be recognised that one or other numbers of blanks may be employed, where suitable, for example, to provide the carrier structure described in more detail below.

The packaging structures or cartons described herein may be formed from a sheet material such as paperboard, which may be made of or coated with materials to increase its strength. An example of such a sheet material is tear-resistant NATRALOCK® paperboard made by WestRock Company. It should be noted that the tear resistant materials may be provided by more than one layer, to help improve the tear-resistance of the package. Typically, one surface of the sheet material may have different characteristics to the other surface. For example, the surface of the sheet material that faces outwardly from a finished package may be particularly smooth and may have a coating such as a clay coating or other surface treatment to provide good printability. The surface of the sheet material that faces inwardly may, on the other hand, be provided with a coating, a layer, a treatment or be otherwise prepared to provide properties

such as one or more of tear-resistance, good glue-ability, heat sealability, or other desired functional properties.

In the embodiments illustrated in Figures 1, 3, 6, 11 and 12 the blanks 10; 110; 210; 610; 710 are configured to form a carton or carrier 90; 190; 290; 690 for packaging an exemplary arrangement of exemplary articles B. In the embodiments illustrated the arrangement is a 3 x 2 matrix or array; in the illustrated embodiment two rows of three articles B are provided. In the embodiment of Figure 1 the articles B are 12oz (approx. 355ml) aluminium beverage cans. In the embodiments of Figures 3, 6, 11 and 12 the articles B are 12oz (approx. 355ml) glass bottles

In the embodiment illustrated in Figures 9, 10 and 10C, the blanks 310; 410, 510; 810 are configured to form a carton or carrier 390; 490 for packaging an exemplary arrangement of exemplary articles B. In the embodiments illustrated the arrangement is a 2 x 2 matrix or array; in the illustrated embodiment two rows of two articles B are provided, and the articles B are 16oz (approx. 473ml) beverage cans.

Alternatively, the blanks 10; 110; 210; 310; 410; 510; 610; 710; 810 can be configured to form a carrier for packaging other types, number and size of articles B and/or for packaging articles B in a different arrangement or configuration.

The present invention relates generally to a carton 90; 190; 290; 390; 490; 690 for packaging articles B which carton 90; 190; 290; 390; 490; 690 comprises a corner folding structure.

Turning to Figure 1, there is illustrated a blank 10 for forming a carton 90 (see Figure 2) according to a first embodiment. The blank 10 comprises a plurality of main panels 12, 14, 16, 18, 20, 22, 24 for forming a tubular structure. The plurality of main panels 12, 14, 16, 18, 20, 22, 24 comprises; a first base panel 12, a first corner panel 14, a first side panel 16, a top panel 18, a second side panel 20, a second corner panel 22 and a second base panel 20. The plurality of panels 12, 14, 16, 18, 20, 22, 24 may be arranged in a linear series hinged one to the next by corresponding fold lines 13, 15, 17, 19, 21, 23.

In alternative embodiments, the first and second corner panels 14, 22 may be omitted, the fold lines 15, 21 may be omitted.

The first and second corner panels 14, 22 may be considered to form lower portions of the respective one of the first or second side panels 16, 20 to which they are hingedly connected.

The blank 10 is foldable to form a package 90 as illustrated in Figure 2. The first and second base panels 12, 24 are engageable with one another in an overlapping relationship to form a composite base wall 12/24 of the carton 90. The blank 10 may comprise a complementary locking mechanism for securing the second base panel 24 to the first base panel 12. The first base panel 12 may comprise at least one first part M of the complementary locking mechanism. The second base panel 24 may comprise at least one second part F of the complementary locking mechanism. In the illustrated embodiment, the second base panel 24 comprises a plurality of female tabs F defining openings in the first base panel 12. The first base panel 12 comprises a plurality of male tabs M, the openings in the second base panel 24 being configured to receive a respective one of the male tabs M. The female tabs F are arranged to be displaced out of the second base panel 24 to form the opening and to bear against the male tabs M when received therein. In some embodiments the complementary locking mechanism M/F may be omitted, the first and second base panels 12, 24 may be secured to each other by other means such as but not limited to adhesive or staples.

Optionally, the first and second base panels 12, 24 may comprise at least one first aperture A1. In the illustrated embodiment, each of the first and second base panels 12, 24 comprises two first apertures A1. Optionally, the first and second base panels 12, 24 may comprise at least one second aperture A2. In the illustrated embodiment, the first base panel 12 comprises one second aperture A2. The first and second apertures A1, A2 may be employed to facilitate construction of the carton 90. A packaging machine component may engage with the first and second apertures A1, A2 to enable the plurality of panels 12, 14, 16, 18, 20, 22, 24 to be tightened about a group of articles B. The first and second apertures A1, A2 may also be employed to facilitate alignment of the first and second base panels 12, 24 with respect to each other or to align the first part of the complementary locking mechanism with the second part of the complementary locking mechanism. The complementary locking mechanism illustrated and described is entirely optional.

The blank 10 may comprise at least one heel engagement structure for engaging with a heel or lower portion of an article B. The blank 10 illustrated in Figure 1 comprises six heel

engagement structures each is provided for engaging a respective article B. Each of the heel engagement structures is substantially similar in construction and will be described by reference to a heel engagement structure provided in the second side panel 20 and in the second corner panel 22.

The heel engagement structure may comprise an opening. The opening is defined in part by a heel aperture A3 and in part by a heel tab 40. The heel tab 40 is hingedly connected to the second base panel 24 by a fold line 41. The heel tab 40 may be struck, at least in part, from the second corner panel 22, when present, or from the second side panel 20. The heel tab 40 may be struck, at least in part, from the second base panel 24.

The fold line 41 interrupts the fold line 23 hingedly connecting the second base panel 24 to the second corner panel 22. The fold line 41 may be non-linear, in the illustrated embodiment the fold line 41 is curved or arcuate in shape, in other embodiments it may be formed from at least two linear cut lines divergently arranged with respect to each other and contiguous with each other.

The heel tab 40 may comprise a pair of divergently arranged fold lines (not shown) which may define foldable corner portions of the heel tab 40.

The top panel 18 may comprise an optional handle structure H. The handle structure H comprises a pair of foldable finger tabs 60a, 60b. The finger tabs 60a, 60b are spaced apart from each other. The finger tabs 60a, 60b are hingedly connected to the top panel 18 by fold lines 61a, 61b and are defined in part by a cut line or severance line 63a, 63b. A first one of the finger tabs 60a is hingedly connected to the top panel 18 in opposition to a second one of the finger tabs 60b.

Each of the panels 12, 16, 18, 20, 24 is formed with a pair of cut-outs or recesses. The cut-outs are defined in opposed end edges of the blank 10. The cut-outs comprise full, major cut-outs in the first and second side panel 16, 20 and the top panel 18 and partial or minor cut-outs in the first and second base panels 12, 24.

A first cut-out is defined in the top panel 18 around the midway along each of its opposed end edges. A second cut-out is defined in each end edge of the first side panel 16. A third cut-out is defined in each end edge of the second side panel 20.

A partial or minor cut-out is defined in each of the opposed end edges of each of the first and second base panels 12, 24.

As a result, the blank 10 is provided along either longitudinal edge thereof with four tabs or projections each interposed between adjacent ones of the cut-outs.

As illustrated in Figure 1, a first upper projection is positioned astride the adjacent fold line 17. A second upper projection is positioned astride the adjacent fold line 19.

A first lower projection is positioned astride the adjacent fold lines 13, 15. A second lower projection is positioned astride the adjacent fold lines 21, 23.

Each of the first and second upper projections provided material for forming, or assisting in forming of, an end retention structure for preventing the contents of the carton 90 from dislodging from the carton 90 when said blank 10 is erected into the carton 90. Each of the first and second upper projections is provided with cut and fold lines to form a top-engaging structure when it is folded along the fold lines.

More specifically, each upper projection comprises an anchoring panel 26a, 26b, 36a, 36b hingedly connected to the adjacent side panel 16, 20 along a fold line 25a, 35b, 39a, 39b. Each upper projection comprises a gusset panel 28a, 28b, 34a, 34b hingedly connected to the anchoring panel 26a, 26b, 36a, 36b along a fold line 27a, 27b, 37a, 37b.

Each upper projection comprises a web panel 30a, 30b, 32a, 32b (also referred herein as a top end closure panel) hingedly connected to the gusset panel 28a, 28b, 34a, 34b along an extension 29a, 29b, 35a, 35b of respective one of the fold lines 17, 19. Each upper projection comprises a covering portion that is integrally formed with the top panel 18. Each web panel 30a, 30b, 32a, 32b is hingedly connected to the respective covering portion by a fold line 31a, 31b, 33a, 33b.

The blank 10 comprises a corner folding arrangement, in the illustrated embodiment a gusseted corner arrangement is provided which is free of a punched-out opening. An opening or aperture is usually placed in corner gusset panels to facilitate folding of the gusset panels see, for example, US20150225155 to Ikeda. Such openings create pieces of scrap paper board which need to be separated from the blank 10, in high-speed die-cutting and blanking processes the scrap pieces may tend to hang or snag on the blank 10 or they may be scattered around the die cutting station. These rogue scrap pieces may find their way into subsequent packaging machinery where they may interfere with the assembly process causing jams or downtime. They may cause damage to the machinery or packages.

The blank 10 comprises four corner folding arrangements at each corner of the top panel 18, the corner folding arrangements are substantially the same and will be described with regard to an enlarged view of one of the corner arrangements shown in Figure 1.

The corner folding arrangement comprises a severance line 70 in the form of a cut line. The severance line 70 extends across or intersects the fold line 19 between the top panel 18 and the second side panel 20, this fold line is also referred to herein as second fold line 19.

The severance line 70 extends from the fold line 39b between the second side panel 20 and an anchoring panel 36b, the fold line 39b is also referred to herein as fourth fold line 39b.

The severance line 70 extends towards the fold line 33b between the top panel 18 and an end flap 32b. The severance line 70 may extend to the fold line 33b between the top panel 18 and an end flap 32b. The severance line 70 extends beyond or past the fold line 33b between the top panel 18 and an end flap 32b so as to extend into the top panel 18. The fold line 33b is also referred to herein as first fold line 33b.

The severance line 70 extends across or through the fold line 35b between the top end closure panel 32b and the gusset panel 34b, this fold line is also referred to herein as third fold line 35b.

The severance line 70 extends across or through the fold line 37b between anchoring panel 36b and the gusset panel 34b, this fold line is also referred to herein as fifth fold line 37b.

The severance line 70 can be considered to intersect or terminate each of the first, second, third, fourth and fifth fold lines 33b, 19, 35b, 39b, 37b.

The severance line 70 in the illustrated embodiment is non-linear and may be curvilinear. In other embodiments the severance line 70 may be defined by two or more linear sections divergently arranged with respect to each other. In still other embodiments the severance line 70 may be linear. In embodiments in which the severance line 70 is linear the severance line 70 may be divergently arranged with respect to the first and/or fourth fold lines 33b, 39b. The severance line 70 may be divergently arranged with respect to second fold line 19 and may be obliquely oriented thereto.

The severance line 70 extends between the first fold line 33b and fourth fold line 39b.

The severance line 70 bypasses a notional intersection or vertex V between a notional extension of the first fold line 33b and the second fold line 19 such that the notional intersection V is located on one side of the severance line 70. The notional intersection V is located on a first side of the severance line 70 and anchor and gusset panels 36b, 34b are located on a second, opposing, side of the severance line 70. The notional intersection V may be spaced apart from the anchor and gusset panels 36b, 34b.

The third fold line 39b may intersect or pass through the notional vertex V. Notional extensions of the fourth and fifth fold lines 39b, 37b may intersect or pass through the notional vertex V.

The fifth fold line 37b may be interrupted by a "U" shaped cut line 43b to define a tab portion struck from material which would otherwise form the gusset panel 34b. The tab portion is integral with the anchor panel 36b.

The severance line 70 intersects with the third fold line 35b at a first intersection P. The first intersection P is disposed at a position closer to the gusset panel 34b than the notional intersection V of the first fold line 33b and second fold line 19.

Figure 16 illustrates an alternative embodiment of the corner folding arrangement shown in Figure 1. In this embodiment the severance line 70 comprises an extension 70a, the extension 70a extends the severance line 70 further into the top panel 18. Whereas in the embodiment of

Figure 1 the severance line 70 terminates in the top panel 18 at a location substantially lying upon a notional extension N1 of the fourth fold line 39b in the ninth illustrated embodiment of Figure 16 the extension 70a extends the severance line 70 beyond the notional extension N1 of fourth fold line 39b.

In alternative embodiments the severance line 70 may terminate at other locations, and may terminate at the end edge of the top panel 18 defined by the first fold line 33b. It some embodiments the severance line 70 may extend into the second side panel 20.

Folding of each upper tab is achieved during the erection of the carton. To form a top end closure structure out of each upper tab, the anchoring panel 26a, 26b, 36a, 36b is folded about 180 degrees to bring it into a face-contacting relationship with the inside surface of the adjacent side panel 16, 20. The anchoring panel 26a, 26b, 36a, 36b is held in the folded position by being pressed by one of the packaged articles B against the adjacent side panel 16, 20. The folding of the anchoring panel 26a, 26b, 36a, 36b causes the gusset panel 28a, 28b, 34a, 34b to be folded outwardly about the fold line 27a, 27b, 37a, 37b so that the gusset panel 28a, 28b, 34a, 34b extends outwardly from the fold line 27a, 27b, 37a, 37b along the side wall of the one packaged article B. At the same time, the web panel 30a, 30b, 32a, 32b is caused to fold downwardly along the fold line 31a, 31b, 33a, 33b and is thereby brought to a folded position where it extends between the fold line 31a, 31b, 33a, 33b and the outer edge of the gusset panel 28a, 28b, 34a, 34b. The top end closure structure thus completed is illustrated in Figure 2 wherein the structure is shown as tightly engaging the top of the one article B.

Each lower projection serves to provide sufficient material in which the adjacent endmost heel aperture A3 is defined. More particularly, the heel aperture A3 adjacent to each lower projection is positioned such that sufficient material surrounds the heel aperture A3 even when the heel aperture A3 extends into that lower projection. During the erection and packaging of articles B, the blank 10 is manipulated so that each heel aperture A3 receives the bottom of a respective article B to retain said article B within the carton 90. The heel tabs 40 are also folded to assist in retaining the articles B.

Turning to the construction of the carton 90 as illustrated in Figure 2, the carton 90 can be formed by a series of sequential folding operations in a straight line machine so that the carton 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.

A group of articles B is assembled; in the embodiment illustrated in Figure 2 six articles B are arranged in a 3 x 2 array. The top panel 18 of the blank 10 is disposed above the group of articles B to provide a top wall 18 of the carton 90.

The first and second side walls 16, 22 are folded, with respect to the top panel 18 about fold lines 17, 19 respectively, about opposing sides of the group of articles B so as to be disposed about the opposing sides of the group of articles B.

The anchor portions 26a, 26b, 36a, 36 may be folded into face contacting relationship with the respective one of the first and second side panel 16, 20 substantially simultaneously with folding the first and second side walls 16, 20 with respect to the top panel 18, to form the top end closure structures described above.

Alternatively, the top engaging structures may be formed subsequent to erection of the carton 90 into a tubular form. The anchor portions 26a, 26b, 36a, 36 may be tucked between the respective one of the first and second side panels 16, 20 to which they are hingedly connected and an adjacently disposed article B.

The first and second corner panels 14, 22 are folded, with respect to the respective one of the first and second side walls 16, 20 about fold lines 15, 21 respectively, about the heels or lower portions of adjacently disposed articles B.

The heel tabs 40 may folded out of the plane of the first and second corner panels 14, 22, about fold line 41, prior to folding the first and second corner panels 14, 22 the respective one of the first and second side walls 16, 20.

The second base panel 24 is folded about the fold line 23 so as to be disposed adjacent the base of the group of articles B, the first base panel 12 is then folded about the fold line 13 so as to be in at least partial overlapping relationship with the second base panel 24; in doing so each of the heel tabs 40 may be brought into engagement with a base of a respective article B.

The first and second base panels 12, 24 are secured together. Each of the male tabs M is displaced inwardly out of the plane of the first base panel 12. In so doing, each of the female tabs F is displaced inwardly creating a corresponding opening in the second base panel 24. The male tabs M are received in respective ones of the openings so as to lock the first and second base panels 12, 24 together. In this way a tubular structure is formed about the group of articles B.

The assembled carton 90, or at least a portion thereof, is shown in Figure 2.

Referring now to Figures 3 to 5 there is shown an alternative embodiment of the present disclosure. 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.

Turning to Figure 3, there is illustrated a blank 110 for forming a carton 190 according to a first embodiment. The blank 110 comprises a plurality of main panels 112, 114, 116, 118, 120, 122, 124 for forming a tubular structure. The plurality of main panels 112, 114, 116, 118, 120, 122, 124 comprises; a first base panel 112, a first lower side panel 114, a first upper side panel 116, a top panel 118, a second upper side panel 120, a second lower side panel 122, and a second base panel 124. The plurality of panels 112, 114, 116, 118, 120, 122, 124 may be arranged in a linear series hinged one to the next by corresponding fold lines 113, 115, 117, 119, 121, 123.

The first base panel 112 is hinged to the first lower side panel 114 by a hinged connection in the form of a fold line 113. The first lower side panel 114 is hinged to the first upper side panel 116 by a hinged connection in the form of a fold line 115. The first upper side panel 116 is hinged to the top panel 118 by a hinged connection in the form of a fold line 117. The top panel 118 is hinged to the second upper side panel 120 by a hinged connection in the form of a fold line 119. The second upper side panel 120 is hinged to the second lower side panel 122 by a hinged connection in the form of a fold line 121. The second lower side panel 122 is hinged to the second base panel 124 by a hinged connection in the form of a fold line 123.

The first upper side panel 116 and the first lower side panel 114 form a first side wall 114/116 of a carton 190. The second upper side panel 120 and the second lower side panel 122 form a second side wall 120/122 of a carton 190.

The blank 110 is foldable to form a package 190 as illustrated in Figures 4 and 5. The first and second base panels 112, 124 are engageable with one another in an overlapping relationship to form a composite base wall 112/124 of the carton 190. The blank 110 may comprise a complementary locking mechanism for securing the second base panel 124 to the first base panel 112 arranged substantially as described in respect of the first embodiment of Figure 1.

The first and second base panels 112, 124 may comprise at least one first aperture A1. In the illustrated embodiment, the first base panel 112 comprises three first apertures A1, the second base panel 124 comprises two first apertures A1. The second base panel 124 may comprise at least one second aperture A2. In the illustrated embodiment, the second base panel 124 comprises one second aperture A2. The first and second apertures A1, A2 may be employed to facilitate construction of the carton 190.

The blank 110 comprises at least one end closure structure for at least partially closing an end of a tubular structure defined by the plurality of panels 112, 114, 116, 118, 120, 122, 124.

In the illustrated embodiment an end closure structure is provided for partially closing each end of the tubular structure.

Each of the end closure structures may be arranged to partially close an end of the tubular structure so as to provide or define a display window for the display of one or more articles B disposed adjacent thereto.

The blank 110 comprises a first end closure structure comprising a plurality of end closure panels 126a, 128a, 130a, 132a, 134a, 136a, 138a, 140a, 142a, 144a, 146a, 148a, 150a.

The first end closure structure comprises a first top end closure flap 138a/140a hingedly connected to the top panel 118 by a fold line 139a. The first top end closure flap 138a/140a comprises an upper part 138a hingedly connected to a lower part 140a by a hinged connection in the form of a fold line 141a.

A first upper end closure flap 134a is coupled to the first upper side panel 116 by a first upper web panel 132a. The first upper web panel 132a is hingedly connected to the first upper side panel 116 by a fold line 131a. The first upper end closure flap 134a is hingedly connected to the first web panel 132a by a fold line 133a.

The first upper end closure flap 134a is hingedly connected to first top end closure flap 138a/140a by a first gusset panel 136a. The first upper end closure flap 134a is hingedly connected to the first gusset panel 136a by a hinged connection in the form of a fold line 135a. The first gusset panel 136a is hingedly connected to the first top end closure flap 138a/140a by a hinged connection in the form of a fold line 137a.

The blank 110 comprises a corner folding arrangements at a first corner of the top panel 118 proximate the first gusset panel 136a, the corner folding arrangement is described in further detail below.

A second upper end closure flap 144a is coupled to the second upper side panel 120 by a second upper web panel 146a. The second upper web panel 146a is hingedly connected to the second upper side panel 120 by a fold line 147a. The second upper end closure flap 144a is hingedly connected to the second web panel 146a by a fold line 149a.

The second upper end closure flap 144a is hingedly connected to the first top end closure flap 138a/140a by a second gusset panel 142a. The second upper end closure flap 144a is hingedly connected to the second gusset panel 142a by a hinged connection in the form of a fold line 145a. The second gusset panel 142a is hingedly connected to the first top end closure flap 138a/140a by a hinged connection in the form of a fold line 143a.

The blank 110 comprises a corner folding arrangements at a second corner of the top panel 118 proximate the second gusset panel 142a, the corner folding arrangement is described in further detail below.

Optionally, the first end closure structure comprises a first lower side end closure flap 126a hingedly connected to the first lower side panel 114 by a first lower web panel 130a. The first lower side end closure flap 126a is hingedly connected to the first lower web panel 130a by a

hinged connection in the form of a fold line 125a. The first lower web panel 130a is hingedly connected to the first lower side panel 114 by a hinged connection in the form of a fold line 129a.

Optionally, a second lower side end closure flap 150a is hinged to the second lower side panel 122 by a second lower web panel 148a. The second lower side end closure flap 150a is hingedly connected to the second lower web panel 148a by a hinged connection in the form of a fold line 153a. The second lower web panel 148a is hingedly connected to the second lower side panel 122 by a hinged connection in the form of a fold line 151a.

Optionally, a first bottom end closure flap 128a is hinged to the first base panel 112 by hinged connection in the form of a fold line 127a. The first lower side end closure flap 126a, second lower side end closure flap 150a and the first bottom end closure flap 128a are arranged to partially close a lower region of an open end of the tubular structure.

The blank 110 comprises a second end closure structure comprising a plurality of end closure panels 126b, 128b, 130b, 132b, 134b, 136b, 138b, 140b, 142b, 144b, 146b, 148b, 150b.

The second end closure structure comprises a second top end closure flap 138b/140b hingedly connected to the top panel 118, at a second end thereof, by a fold line 139b. The second top end closure flap 138b/140b comprises an upper part 138b hingedly connected to a lower part 140b by a hinged connection in the form of a fold line 141b.

A third upper end closure flap 134b is coupled to the first upper side panel 116 by a third web panel 132b. The third web panel 132b is hingedly connected to the first upper side panel 116 by a fold line 131b. The third upper end closure flap 134b is hingedly connected to the third web panel 132b by a fold line 133b.

The third upper end closure flap 134b is hingedly connected to second top end closure flap 138b/140b by a third gusset panel 136b. The third upper end closure flap 134b is hingedly connected to the third gusset panel 136b by a hinged connection in the form of a fold line 135b. The third gusset panel 136b is hingedly connected to the second top end closure flap 138b/140b by a hinged connection in the form of a fold line 137b.

The blank 110 comprises a corner folding arrangements at a third corner of the top panel 118 proximate the third gusset panel 136b, the corner folding arrangement is described in further detail below.

A fourth upper end closure flap 144b is coupled to the second upper side panel 120 by a fourth web panel 146b. The fourth web panel 146b is hingedly connected to the second upper side panel 120 by a fold line 147b. The fourth upper end closure flap 144b is hingedly connected to the fourth web panel 146b by a fold line 149b.

The fourth upper end closure flap 144b is hingedly connected to the second top end closure flap 138b/140b by a fourth gusset panel 142b. The fourth upper end closure flap 144b is hingedly connected to the fourth gusset panel 142b by a hinged connection in the form of a fold line 145b. The fourth gusset panel 142b is hingedly connected to the second top end closure flap 138b/140b by a hinged connection in the form of a fold line 143b.

The web panels 132a, 132b, 146a, 146b are optional and may be omitted, in such embodiments the fold lines 131a, 131b, 147a, 147b are omitted. The first, second, third and fourth upper end closure flap 134a, 134b, 144a, 144b is hinged directly to a respective one of the first and second upper side panels 116, 120.

The blank 110 comprises a fourth corner folding arrangement (best shown in Figure 3B) at a fourth corner of the top panel 118 proximate the fourth gusset panel 142b, each of the corner folding arrangements are substantially the same in construction and will be described with regard to an enlarged view of the fourth corner arrangement shown in Figure3 and 3B.

The fourth corner folding arrangement comprises a severance line 170 in the form of a cut line. The severance line 170 extends across or intersects the fold line 149b between the fourth upper end closure flap 144b and the fourth web panel 146b, the fold line 149b is also referred to herein as fourth fold line 149b.

The severance line 170 extends from the fold line 119 between the top panel 118 and the second side panel 120, the fold line 119 is also referred to herein as second fold line 119.

The severance line 170 extends towards the fold line 143b between the second top end closure flap 138b/140b and fourth gusset panel 142b. The severance line 170 may extend to the fold line 143b. The severance line 170 extends beyond or past the fold line 143b so as to extend into the second top end closure flap 138b/140b. The fold line 143b is also referred to herein as third fold line 143b.

The severance line 170 extends across or through the fold line 145b between the fourth gusset panel 142b and the fourth upper end closure flap 144b, this fold line is also referred to herein as fifth fold line 145b.

The fold line 139b between the top panel 118 and the second top end closure flap 138b/140b extends towards the severance line 170. The fold line 139b is also referred to herein as first fold line 139b.

The first and second fold lines 139b, 119 define a notional intersection or vertex V.

The severance line 170 can be considered to intersect or terminate each of the first, second, third, fourth and fifth fold lines 139b, 119, 143b, 149b, 145b.

The severance line 170 in the illustrated embodiment is non-linear and may be curvilinear. In other embodiments the severance line 170 may be defined by two or more linear sections divergently arranged with respect to each other. In still other embodiments the severance line 170 may be linear. In embodiments in which the severance line 170 is linear the severance line 170 may be divergently arranged with respect to at least the second and/or third fold lines 119, 143b.

The severance line 170 extends between the second fold line 119 and third fold line 143b.

The severance line 170 bypasses the notional intersection or vertex V such that the notional intersection V is located on one side of the severance line 170. The notional intersection V is located on a first side of the severance line 170 and the fourth upper end closure flap 144b and the fourth gusset panel 142b are located on a second, opposing, side of the severance line 170. The notional intersection V may be spaced apart from the fourth upper end closure flap 144b and the fourth gusset panel 142b.

The fourth fold line 149b may intersect or pass through the notional vertex V and may intersect or meet the first fold line 139b. Notional extensions N4, N3 of the third and fifth fold lines 143b, 145b may intersect or pass through the notional vertex V.

The severance line 170 intersects with the fourth fold line 149b at a first intersection P2. The first intersection P2 is disposed at a position closer to the fourth upper end closure flap 144b and/or the fourth gusset panel 142b than the notional intersection V of the first fold line 139b and second fold line 119.

Optionally, the first end closure structure comprises a third lower side end closure flap 126b hingedly connected to the first lower side panel 114 by a third lower web panel 130b. The third lower side end closure flap 126b is hingedly connected to the third lower web panel 130b by a hinged connection in the form of a fold line 125b. The third lower web panel 130b is hingedly connected to the first lower side panel 114 by a hinged connection in the form of a fold line 129b.

Optionally, a fourth lower side end closure flap 150b is hinged to the second lower side panel 122 by a fourth lower web panel 148b. The fourth lower side end closure flap 150b is hingedly connected to the fourth lower web panel 148b by a hinged connection in the form of a fold line 153b. The fourth lower web panel 148b is hingedly connected to the second lower side panel 122 by a hinged connection in the form of a fold line 151b.

Optionally, a second bottom end closure flap 128b is hinged to the first base panel 112 by hinged connection in the form of a fold line 127b. The third lower side end closure flap 126b, fourth lower side end closure flap 150b and the second bottom end closure flap 128b are arranged to partially close a lower region of an open end of the tubular structure.

The blank 110 comprises an optional carrying handle structure H. The handle structure H comprises a pair of foldable tabs 160a, 160b. The tabs 160a, 160b are spaced apart from each other. The tabs 160a, 160b are hingedly connected to the top panel 118 by fold lines 161a, 161b and are defined in part by a cut line or severance line 163a, 163b. Each of the severance lines 163a, 163b may extend into one or both of the first and second upper side panels 116, 120. The

A first one of the tabs 160a is hingedly connected to the top panel 118 in opposition to a second one of the tabs 160b.

Turning to the construction of the carton 190 as illustrated in Figures 4 and 5, the carton 190 can be formed by a series of sequential folding operations in a straight line machine so that the carton 190 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.

A group of articles B is assembled; in the preferred embodiment six articles B are arranged in a 3 x 2 array. The top panel 118 of the blank 110 is disposed above the group of articles B to provide a top wall 118 of the carton 190.

The first and second sidewalls 114/116, 120/122 are folded about the opposing sides of the group of articles B; the second base panel 124 is folded about the fold line 123 so as to be disposed adjacent the base of the group of articles B. The first base panel 112 is then folded about the fold line 113 so as to be in at least partial overlapping relationship with the second base panel 124. The first and second base panels 112, 124 are secured together. Each of the male tabs M is displaced inwardly out of the plane of the first base panel 112. In so doing, each of the female tabs F is displaced inwardly creating a corresponding opening in the second base panel 124. The male tabs M are received in respective ones of the openings so as to lock the first and second base panels 112, 124 together. In this way a tubular structure is formed about the group of articles B.

In some embodiments, the blank 110 may be formed into a tubular structure and subsequently loaded with articles B through at least one open end thereof.

The first and second end closure structures are folded about the open ends of the tubular structure. The folding sequence for each of the first and second end closure structures is substantially the same and will be described in more detail by reference to the first end closure structure only.

The first and second upper web panels 132a, 146a and first and second upper side end closure flaps 134a, 144a are folded about the fold lines 131a, 133a, 147, 149aa so as to partially close a first open end of the tubular structure.

The first and second gusset panels 136a, 142a at least partially fold in response to folding the first and second upper side end closure flaps 134a, 144a. The first top end closure panel 138a/140a folds, at least partially, in response to folding of the first and second gusset panels 136a, 142a.

The first and second gusset panels 136a, 142a are folded between the first top end closure panel 138a/140a and the respective one of first and second upper side end closure flaps 134a, 144a to which they are coupled.

The first top end closure panel 138a/140a is folded about fold line 139a to be brought in to face to face relationship with first and second upper side end closure flaps 134a, 144a and the first and second gusset panels 136a, 142a.

The second or lower part 140a of the first top end closure panel 138a/140a is folded, outwardly, with respect to the first or upper part 138a of the first top end closure panel 138a/140a by folding about fold line 141a.

Glue or other adhesive treatment is applied to each of the first and second upper side end closure flaps 134a, 144a. In other embodiments the glue may be applied to corresponding regions of an inner surface of the second part of the first top end closure panel 138a/140a.

The second part 140a of the first top end closure panel 138a/140a is unfolded with respect to the first part 138a of the first top end closure panel 138a/140a by folding about fold line 141a to bring the second part 140a of the first top end closure panel 138a/140a into face contacting relationship with the first and second upper side end closure flaps 134a, 144a.

The first top end closure panel 138a/140a is secured to the first and second upper side end closure flaps 134a, 144a.

The first and second lower web panels 130a, 148a first and second lower side end closure flaps 126a, 150a are folded about fold lines 125a, 129a, 151a, 153a respectively.

In some embodiments the first and second lower side end closure flaps 126a, 150a may be dimensioned so as to be arranged in an at least partial overlapping arrangement. The first lower side end closure flap 126a may be secured to the second lower side end closure flap 150a. Glue or other adhesive treatment may be applied to one of the first and second lower side end closure flaps 126a, 150a so as to secure them together.

Glue or other adhesive treatment is applied to each of the first and second lower side end closure flaps 126a, 150a. In other embodiments the glue may be applied to corresponding regions of an inner surface of the bottom end closure flap 128a.

The bottom end closure flap 128a is folded about fold line 127a so as to be brought up into face contacting relationship with the first and second lower side end closure flaps 126a, 150a.

The bottom end closure flap 128a is secured to the first and second lower side end closure flaps 126a, 150a.

Referring now to Figures 6 to 8 there is shown an alternative embodiment of the present disclosure. 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 embodiment of Figures 3 to 5, therefore only the differences from the embodiment illustrated in Figures 3 to 4 will be described in any greater detail.

Figure 3 shows a blank 210 for forming a carrier and comprises a plurality of main panels 212, 214, 216, 218, 220, 222, 224 for forming a tubular structure. The plurality of main panels 212, 214, 216, 218, 220, 222, 224 comprises; a first base panel 212, a first lower side panel 214, a first upper side panel 216, a top panel 218, a second upper side panel 220, a second lower side panel 222, and a second base panel 224. The plurality of panels 212, 214, 216, 218, 220, 222, 224 may be arranged in a linear series hinged one to the next by corresponding fold lines 213, 215, 217, 219, 221, 223.

The blank 210 comprises at least one end closure structure for at least partially closing an end of a tubular structure defined by the plurality of panels 212, 214, 216, 218, 220, 222, 224.

In the illustrated embodiment an end closure structure is provided for partially closing each end of the tubular structure.

Each of the end closure structures may be arranged to partially close an end of the tubular structure so as to provide or define a display window for the display of one or more articles B disposed adjacent thereto. Each of the end closure structures comprises two corner folding arrangements and the end closure structures substantially the same in construction and will be described in further detail with reference to the second end closure structure.

The blank 210 comprises a second end closure structure comprising a plurality of end closure panels 226b, 228b, 230b, 232b, 234b, 236b, 238b, 240b, 242b, 244b, 246b, 248b, 250b.

The second end closure structure comprises a second top end closure flap 238b/240b hingedly connected to the top panel 218, at a second end thereof, by a fold line 239b. The second top end closure flap 238b/240b comprises an upper part 238b hingedly connected to a lower part 240b by a hinged connection in the form of a fold line 241b.

A third upper end closure flap 234b is coupled to the first upper side panel 216 by a third web panel 232b. The third web panel 232b is hingedly connected to the first upper side panel 216 by a fold line 231b. The third upper end closure flap 234b is hingedly connected to the third web panel 232b by a fold line 233b.

The third upper end closure flap 234b is hingedly connected to second top end closure flap 238b/240b by a third gusset panel 236b. The third upper end closure flap 234b is hingedly connected to the third gusset panel 236b by a hinged connection in the form of a fold line 235b. The third gusset panel 236b is hingedly connected to the second top end closure flap 238b/240b by a hinged connection in the form of a fold line 237b.

The blank 210 comprises a corner folding arrangement at a third corner of the top panel 218 proximate the third gusset panel 236b, the corner folding arrangements provided in the blank

210 are substantially the same in construction and will be described in further detail with reference to a corner folding arrangement located at a fourth corner of the top panel 218.

A fourth upper end closure flap 244b is coupled to the second upper side panel 220 by a fourth web panel 246b. The fourth web panel 246b is hingedly connected to the second upper side panel 220 by a fold line 247b. The fourth upper end closure flap 244b is hingedly connected to the fourth web panel 246b by a fold line 249b.

The fourth upper end closure flap 244b is hingedly connected to the second top end closure flap 238b/240b by a fourth gusset panel 242b. The fourth upper end closure flap 244b is hingedly connected to the fourth gusset panel 242b by a hinged connection in the form of a fold line 245b. The fourth gusset panel 242b is hingedly connected to the second top end closure flap 238b/240b by a hinged connection in the form of a fold line 243b.

The web panels 232a, 232b, 246a, 246b are optional and may be omitted, in such embodiments the fold lines 231a, 231b, 247a, 247b are omitted. The first, second, third and fourth upper end closure flap 234a, 234b, 244a, 244b is hinged directly to a respective one of the first and second upper side panels 216, 220.

The blank 210 comprises a fourth corner folding arrangement (best shown in Figure 7B) at a fourth corner of the top panel 218 proximate the fourth gusset panel 242b.

The fourth corner folding arrangement comprises a severance line 270 in the form of a cut line. The severance line 270 extends across or intersects the fold line 219 between the top panel 218 and the second side panel 220, this fold line is also referred to herein as second fold line 219.

The severance line 270 extends from the fold line 249b between the fourth web panel 246b and fourth upper end closure flap 244b, the fold line 249b is also referred to herein as fourth fold line 249b.

The severance line 270 extends towards the fold line 239b between the top panel 218 and the second top end closure flap 238b/240b. The severance line 270 may extend to the fold line 239b between the top panel 218 and the second top end closure flap 238b/240b. The severance line 270 extends beyond or past the fold line 239b between the top panel 218 and the second

top end closure flap 238b/240b so as to extend into the top panel 218. The fold line 239b is also referred to herein as first fold line 239b.

The severance line 270 extends across or through the fold line 243b between the second top end closure flap 238b/240b and the fourth gusset panel 242b, this fold line is also referred to herein as third fold line 243b.

The severance line 270 extends across or through the fold line 245b between fourth upper end closure flap 244b and the fourth gusset panel 242b, this fold line is also referred to herein as fifth fold line 245b.

The severance line 270 can be considered to intersect or terminate each of the first, second, third, fourth and fifth fold lines 239b, 219, 243b, 249b, 245b.

The severance line 270 in the illustrated embodiment is non-linear and may be curvilinear. In other embodiments the severance line 270 may be defined by two or more linear sections divergently arranged with respect to each other. In still other embodiments the severance line 70 may be linear.

The severance line 270 extends between the first fold line 239b and fourth fold line 249b.

The severance line 270 bypasses a notional intersection or vertex V between a notional extension of the first fold line 239b and the second fold line 219 such that the notional intersection V is located on one side of the severance line 270. The notional intersection V is located on a first side of the severance line 270 and the fourth upper end closure flap 244b and the fourth gusset panel 242b are located on a second, opposing, side of the severance line 270. The notional intersection V may be spaced apart from the fourth upper end closure flap 244b and the fourth gusset panel 242b.

The fourth fold line 249b, or a notional extension thereof, may intersect or pass through the notional vertex V. Notional extensions N4, N3 of the third and fifth fold lines 243b, 245b may intersect or pass through the notional vertex V.

The severance line 270 intersects with the third fold line 243b at a first intersection P. The first intersection P is disposed at a position closer to the fourth upper end closure flap 244b and/or the fourth gusset panel 242b than the notional intersection V of the first fold line 239b and second fold line 219.

Referring now to Figures 9, 13A and 13B there is shown an alternative embodiment of the present disclosure. 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.

Figure 9 shows a blank 310 for forming a carrier, the blank 310 comprises a plurality of main panels 312, 314, 316, 318, 320, 322, 324 for forming a tubular structure. The plurality of main panels 312, 314, 316, 318, 320, 322, 324 comprises; a first base panel 312, a first side panel 314, a first upper corner panel 316, a top panel 318, a second upper corner panel 320, a second side panel 322, and a second base panel 324. The plurality of main panels 312, 314, 316, 318, 320, 322, 324 may be arranged in a linear series hinged one to the next by corresponding fold lines 313, 315, 317, 319, 321, 323.

The first and second upper corner panels 316, 320 may be considered to form part of a top wall of the carrier 390 along with the top panel 318. Alternatively, the first and second upper corner panels 316, 320 may be considered to form an upper portion of a respective one of the first and second side panels 314, 322.

In some embodiments the first and second upper corner panels 316, 320 may be omitted, in such embodiments the fold lines 315 and 321 may be omitted.

The blank 310 may comprise a complementary locking mechanism for securing the second base panel 324 to the first base panel 312. The second base panel 324 may comprise at least one first part M of the complementary locking mechanism. The first base panel 312 may comprise at least one second part F of the complementary locking mechanism.

The first and second base panels 312, 324 may comprise at least one first aperture A1. In the illustrated embodiment, the first base panel 312 comprises one first aperture A1, the second base panel 324 comprises one first aperture A1. The first and second base panels 312, 324 may

comprise at least one second aperture A2. In the illustrated embodiment, the first base panel 312 comprises one second aperture A2 and the second base panel 324 comprises one second aperture A2. The first and second apertures A1, A2 may be employed to facilitate construction of the carton 390.

The blank 310 comprises an optional carrying handle structure H. The handle structure H comprises a single foldable tab 360. The tab 360 is hingedly connected to the top panel 318 by a fold line 361 and is defined in part by a cut line or severance line 363.

The blank 310 comprises at least one end closure structure for at least partially closing an end of a tubular structure defined by the plurality of panels 312, 314, 316, 318, 320, 322, 324. The blank 310 comprises a first end closure structure comprising a plurality of end closure panels 326a, 328a, 330a, 332a, 334a, 336a, 338a, 340a, 342a, 344a, 346a.

The first end closure structure comprises a first top end closure flap 336a hingedly connected to the top panel 318 by a fold line 339a.

A first bottom end closure flap 336a is hingedly connected to the first base panel 312 by a hinged connection in the form of a fold line 325a.

A first gusset panel 328a is hingedly connected to the first bottom end closure flap 336a by a hinged connection in the form of a fold line 327a.

A first anchor panel 330a is hingedly connected to the first gusset panel 328a by a hinged connection in the form of a fold line 329a. The first anchor panel 330a is hingedly connected to the first side panel 314 by a hinged connection in the form of a fold line 331a.

A first corner end closure flap 334a is hingedly connected to the first top end closure flap 336a by a hinged connection in the form of a fold line 337a. The first corner end closure flap 334a is hingedly connected to a second gusset panel 332a by a hinged connection in the form of a fold line 335a. The second gusset panel 332a is hingedly connected to the first anchor panel 330a by a hinged connection in the form of a fold line 333a.

A second corner end closure flap 338a is hingedly connected to the first top end closure flap 336a by a hinged connection in the form of a fold line 341a. The second corner end closure flap 338a is hingedly connected to a third gusset panel 340a by a hinged connection in the form of a fold line 343a.

The second gusset panel 332a is hingedly connected to a second anchor panel 342a by a hinged connection in the form of a fold line 345a. The second anchor panel 342a is hingedly connected to the second side panel 322 by a hinged connection in the form of a fold line 347a.

A fourth gusset panel 344a is hingedly connected to the second anchor panel 342a by a hinged connection in the form of a fold line 349a.

A second bottom end closure flap 346a is hingedly connected to the second base panel 324 by a hinged connection in the form of a fold line 353a. The second bottom end closure flap 346a is hingedly connected to the fourth gusset panel 344a by a hinged connection in the form of a fold line 351a.

The blank 310 comprises a second end closure structure comprising a plurality of end closure panels 326b, 328b, 330b, 332b, 334b, 336b, 338b, 340b, 342b, 344b, 346b. The second end closure structure comprises a second top end closure flap 336b hingedly connected to the top panel 318 by a fold line 339b.

A third bottom end closure flap 336b is hingedly connected to the first base panel 312 by a hinged connection in the form of a fold line 325b.

A fifth gusset panel 328b is hingedly connected to the third bottom end closure flap 336b by a hinged connection in the form of a fold line 327b.

A third anchor panel 330b is hingedly connected to the fifth gusset panel 328b by a hinged connection in the form of a fold line 329b. The third anchor panel 330b is hingedly connected to the first side panel 314 by a hinged connection in the form of a fold line 331b.

A third corner end closure flap 334b is hingedly connected to the second top end closure flap 336b by a hinged connection in the form of a fold line 337b. The third corner end closure flap

334b is hingedly connected to a sixth gusset panel 332b by a hinged connection in the form of a fold line 335b. The sixth gusset panel 332b is hingedly connected to the third anchor panel 330b by a hinged connection in the form of a fold line 333b.

A fourth corner end closure flap 338b is hingedly connected to the second top end closure flap 336b by a hinged connection in the form of a fold line 341b. The fourth corner end closure flap 338b is hingedly connected to a seventh gusset panel 340b by a hinged connection in the form of a fold line 343b. The seventh gusset panel 332b is hingedly connected to a fourth anchor panel 342b by a hinged connection in the form of a fold line 345b. The fourth anchor panel 342b is hingedly connected to the second side panel 322 by a hinged connection in the form of a fold line 347b.

An eighth gusset panel 344b is hingedly connected to the fourth anchor panel 342b by a hinged connection in the form of a fold line 349b.

A fourth bottom end closure flap 346b is hingedly connected to the second base panel 324 by a hinged connection in the form of a fold line 353b. The fourth bottom end closure flap 346b is hingedly connected to the eighth gusset panel 344b by a hinged connection in the form of a fold line 351b.

The blank 310 comprises four corner folding arrangements, a first pair of corner folding arrangements are located at corners of the first base panel 312 adjacent to the first side panel 314. A second pair of corner folding arrangements are located at corners of the second base panel 324 adjacent to the second side panel 322. The corner folding arrangements are substantially the same and will be described with regard to an enlarged view of one of the corner arrangements between the second base panel 324 and the second side panel 322 an enlarged view of which is shown in Figure 9.

The corner folding arrangement comprises a severance line 370 in the form of a cut line. The severance line 370 extends across or intersects the fold line 323 between the second base panel 324 and the second side panel 322, this fold line is also referred to herein as second fold line 323.

The severance line 370 extends from the fold line 347b between the second side panel 322 and the fourth anchor panel 342b, the fold line 347b is also referred to herein as fourth fold line 347b.

The severance line 370 extends towards the fold line 353b between the second base panel 324 and the fourth bottom end closure flap 346b. The severance line 370 may extend to the fold line 353b between the second base panel 324 and the fourth bottom end closure flap 346b. The severance line 370 extends beyond or past the fold line 353b between the second base panel 324 and the fourth bottom end closure flap 346b so as to extend into the second base panel 324. The fold line 353b is also referred to herein as first fold line 353b.

The severance line 370 extends across or through the fold line 351b between the fourth bottom end closure flap 346b and the eighth gusset panel 344b, this fold line is also referred to herein as third fold line 351b.

The severance line 370 extends across or through the fold line 349b between the fourth anchor panel 342b and the eighth gusset panel 344b, this fold line is also referred to herein as fifth fold line 349b.

The severance line 370 can be considered to intersect or terminate each of the first, second, third, fourth and fifth fold lines 353b, 323, 351b, 347b, 349b.

The severance line 370 in the illustrated embodiment is non-linear and may be curvilinear. In other embodiments the severance line 370 may be defined by two or more linear sections divergently arranged with respect to each other. In still other embodiments the severance line 370 may be linear.

The severance line 370 extends between the first fold line 353b and fourth fold line 347b.

The severance line 370 bypasses a notional intersection or vertex V between a notional extension of the first fold line 353b and the second fold line 323 such that the notional intersection V is located on one side of the severance line 370. The notional intersection V is located on a first side of the severance line 370; the fourth anchor panel 342b and the eighth gusset panel 344b are located on a second, opposing, side of the severance line 370. The

notional intersection V may be spaced apart from the fourth anchor panel 342b and from the eighth gusset panel 344b.

The third fold line 351b, or a notional extension thereof, may intersect or pass through the notional vertex V. Notional extensions of the fourth and fifth fold lines 347b, 349b may intersect or pass through the notional vertex V.

The severance line 370 intersects with the third fold line 351b at a first intersection P. The first intersection P is disposed at a position closer to the eighth gusset panel 344b than the notional intersection V of the first fold line 353b and second fold line 323.

Referring now to Figures 10A, 10B and 14 there is shown an alternative embodiment of the present disclosure. 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.

Figure 10A shows a blank 410 for forming a carrier, the blank 410 comprises a plurality of main panels 412, 414, 416, 418, 420, 422, 424, 426, 428 for forming a tubular structure. The plurality of main panels 412, 414, 416, 418, 420, 422, 424, 426, 428 comprises; a first base panel 412, a first lower corner panel 414, a first side panel 416, a first upper corner panel 418, a top panel 420, a second upper corner panel 422, a second side panel 424, a second lower corner panel 426 and a second base panel 428. The plurality of main panels 412, 414, 416, 418, 420, 422, 424, 426, 428 may be arranged in a linear series hinged one to the next by corresponding fold lines 413, 415, 417, 419, 421, 423, 425, 427.

The first and second upper corner panels 418, 422 may be considered to form part of a top wall of the carrier 490 along with the top panel 420. Alternatively, the first and second upper corner panels 416, 424 may be considered to form an upper portion of a respective one of the first and second side panels 416, 424.

The first and second lower corner panels 414, 426 may be considered to form part of a bottom wall of the carrier 490 along with the first and second base panels 412, 428. Alternatively, the first and second lower corner panels 414, 426 may be considered to form a lower portion of a respective one of the first and second side panels 416, 424.

In some embodiments the first and second upper corner panels 418, 422 may be omitted, in such embodiments the fold lines 317 and 323 may be omitted. In some embodiments the first and second lower corner panels 414, 426 may be omitted, in such embodiments the fold lines 415 and 425 may be omitted.

The blank 410 may comprise a complementary locking mechanism for securing the second base panel 428 to the first base panel 412. The first base panel 412 may comprise at least one first part M of the complementary locking mechanism. The second base panel 428 may comprise at least one second part F of the complementary locking mechanism.

The first and second base panels 412, 428 may comprise at least one first aperture A1. In the illustrated embodiment, the first base panel 412 comprises one first aperture A1, the second base panel 428 comprises one first aperture A1. The first and second base panels 412, 428 may comprise at least one second aperture A2. In the illustrated embodiment, the first base panel 412 comprises one second aperture A2 and the second base panel 428 comprises one second aperture A2. The first and second apertures A1, A2 may be employed to facilitate construction of the carton 490.

The blank 410 comprises an optional carrying handle structure H. The handle structure H comprises a single foldable tab 460. The tab 460 is hingedly connected to the top panel 420 by a fold line 461 and is defined in part by a cut line or severance line 463.

The blank 410 comprises at least one end closure structure for at least partially closing an end of a tubular structure defined by the plurality of panels 412, 414, 416, 418, 420, 422, 424, 426, 428.

The blank 410 comprises a first end closure structure comprising a plurality of end closure panels 430a, 432a, 434a, 436a, 438a, 440a, 442a, 444a, 446a, 448a. The first end closure structure comprises a first bottom end closure flap 430a is hingedly connected to the first base panel 412 by a hinged connection in the form of a fold line 429a.

A first gusset panel 432a is hingedly connected to the first bottom end closure flap 430a by a hinged connection in the form of a fold line 431a.

A first anchor panel 434a is hingedly connected to the first gusset panel 432a by a hinged connection in the form of a fold line 433a. The first anchor panel 434a is hingedly connected to the first side panel 416 by a hinged connection in the form of a fold line 435a.

A second gusset panel 436a is hingedly connected to the first anchor panel 434a by a hinged connection in the form of a fold line 437a.

A first top end closure flap 438a is hingedly connected to the second gusset panel 436a by a hinged connection in the form of a fold line 439a. The first top end closure flap 438a is hingedly connected to the top panel 420 by a hinged connection in the form of a fold line 441a. The first end closure structure comprises a second bottom end closure flap 448a is hingedly connected to the second base panel 428 by a hinged connection in the form of a fold line 455a.

A third gusset panel 446a is hingedly connected to the first bottom end closure flap 448a by a hinged connection in the form of a fold line 453a.

A second anchor panel 444a is hingedly connected to the third gusset panel 446a by a hinged connection in the form of a fold line 451a.

A fourth gusset panel 442a is hingedly connected to the second anchor panel 444a by a hinged connection in the form of a fold line 447a.

The second anchor panel 444a is hingedly connected to the second side panel 424 by a hinged connection in the form of a fold line 449a.

A second top end closure flap 440a is hingedly connected to the fourth gusset panel 442a by a hinged connection in the form of a fold line 445a. The second top end closure flap 440a is hingedly connected to the top panel 420 by a hinged connection in the form of a fold line 443a.

The blank 410 comprises a second end closure structure comprising a plurality of end closure panels 430b, 432b, 434b, 436b, 438b, 440b, 442b, 444b, 446b, 448b. The second end closure structure comprises a third bottom end closure flap 430b is hingedly connected to the first base panel 412 by a hinged connection in the form of a fold line 429b.

A fifth gusset panel 432b is hingedly connected to the first bottom end closure flap 430b by a hinged connection in the form of a fold line 431b.

A third anchor panel 434b is hingedly connected to the fifth gusset panel 432b by a hinged connection in the form of a fold line 433b. The third anchor panel 434b is hingedly connected to the first side panel 416 by a hinged connection in the form of a fold line 435b.

A sixth gusset panel 436b is hingedly connected to the third anchor panel 434b by a hinged connection in the form of a fold line 437b.

A third top end closure flap 438b is hingedly connected to the sixth gusset panel 436b by a hinged connection in the form of a fold line 439b. The third top end closure flap 438b is hingedly connected to the top panel 420 by a hinged connection in the form of a fold line 441b. The first end closure structure comprises a fourth bottom end closure flap 448b is hingedly connected to the second base panel 428 by a hinged connection in the form of a fold line 455b.

A seventh gusset panel 446b is hingedly connected to the first bottom end closure flap 448b by a hinged connection in the form of a fold line 453b.

A fourth anchor panel 444b is hingedly connected to the seventh gusset panel 446b by a hinged connection in the form of a fold line 451b. The fourth anchor panel 444b is hingedly connected to the second side panel 424 by a hinged connection in the form of a fold line 449b.

An eighth gusset panel 442b is hingedly connected to the fourth anchor panel 444b by a hinged connection in the form of a fold line 447b.

A fourth top end closure flap 440b is hingedly connected to the eighth gusset panel 442b by a hinged connection in the form of a fold line 445b. The fourth top end closure flap 440b is hingedly connected to the top panel 420 by a hinged connection in the form of a fold line 443b.

The blank 410 comprises eight corner folding arrangements, a first pair of corner folding arrangements are located at corners of the first base panel 412 adjacent to the first side panel 416 or the first corner panel 414 when present. A second pair of corner folding arrangements

are located at corners of the second base panel 428 adjacent to the second side panel 424 or the fourth corner panel 426 when present.

A third pair of corner folding arrangements are located at corners of the top panel 420 adjacent to the first side panel 416 or the second corner panel 418 when present. A fourth pair of corner folding arrangements are located at corners of the top panel 420 adjacent to the second side panel 424 or the third corner panel 422 when present.

The corner folding arrangements are substantially the same and will be described with regard to an enlarged view of one of the corner arrangements between the top panel 420, the second side panel 424 and the third corner panel 422 an enlarged view of which is shown in Figure 10B.

The corner folding arrangement comprises a severance line 470 in the form of a cut line. The severance line 470 extends across or intersects the fold line 421 between the third corner panel 422 and the top panel 420, this fold line is also referred to herein as second fold line 421.

The severance line 470 extends from the fold line 449b between the second side panel 424 and the fourth anchor panel 444b, the fold line 449b is also referred to herein as fourth fold line 449b.

In the illustrate embodiment the fold line 423 between the third corner panel 422 and the second side panel 424 intersects or terminates at the point of contact between severance line 470 and the fold line 449b. In some embodiments the fold line 423 may not contact the vertex between severance line 470 and the fold line 449b but may be aligned such that a notional linear extension thereof passes through said vertex.

The severance line 470 extends towards the fold line 443b between the top panel 420 and the fourth top end closure flap 440b. The severance line 470 may extend to the fold line 443b between the top panel 420 and the fourth top end closure flap 440b. The severance line 470 extends beyond or past the fold line 443b between the top panel 420 and the fourth top end closure flap 440b so as to extend into the fourth top end closure flap 440b. The fold line 443b is also referred to herein as first fold line 443b.

The severance line 470 extends across or through the fold line 445b between the fourth top end closure flap 440b and the eighth gusset panel 442b, this fold line is also referred to herein as third fold line 445b.

The severance line 470 extends across or through the fold line 447b between the fourth anchor panel 444b and the eighth gusset panel 442b, this fold line is also referred to herein as fifth fold line 447b.

The severance line 470 can be considered to intersect or terminate each of the first, second, third, fourth and fifth fold lines 443b, 421, 445b, 449b, 447b.

The severance line 470 in the illustrated embodiment is non-linear and may be curvilinear. In other embodiments the severance line 470 may be defined by two or more linear sections divergently arranged with respect to each other. In still other embodiments the severance line 470 may be linear.

The severance line 470 extends between the first fold line 443b and fourth fold line 449b.

The severance line 470 bypasses a notional intersection or vertex V between a notional extension N2 of the first fold line 443b and the second fold line 421 such that the notional intersection V is located on one side of the severance line 470. The notional intersection V is located on a first side of the severance line 470; the fourth anchor panel 444b and the eighth gusset panel 442b are located on a second, opposing, side of the severance line 470. The notional intersection V may be spaced apart from the fourth anchor panel 444b and from the eighth gusset panel 442b.

The severance line 470 appears concave when viewed from the second side. In contrast the severance lines 70; 170; 270; 370 of the foregoing embodiments appear convex when viewed from the second side.

The third fold line 445b, or a notional extension thereof, may intersect or pass through the notional vertex V. Notional extensions of the fourth and fifth fold lines 449b, 447b may intersect or pass through the notional vertex V.

The severance line 470 intersects with the third fold line 445b at a first intersection P. The first intersection P is disposed at a position closer to the eighth gusset panel 442b than the notional intersection V of the first fold line 443b and second fold line 421.

Referring now to Figure 10C there is shown an alternative embodiment of the present disclosure. 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 sixth embodiment shares many common features with the embodiment of Figures 10A, 10B and 14, therefore only the differences from the embodiment illustrated in Figures 10A, 10B and 14 will be described in any greater detail.

Figure 10C illustrate a portion of a blank 510. The blank 510 comprises at least one corner folding arrangement, substantially similar in arrangement to the corner folding arrangement of the embodiment of Figure 10. In the embodiment of Figure 10C the corner folding arrangement comprises an additional fold line 557b. The fold line 557b is provided in the top panel 520 and may extend substantially perpendicular to the second fold line 521. The fold line 557b may extend substantially collinearly with the fourth fold line 549b. The fold line 557b may extend towards or intersect with the second fold line 521 at the notional vertex V defined by a notional extension N2 of the first fold line 543b and the second fold line 521.

Referring now to Figure 17 there is shown an alternative embodiment of the present disclosure. In the tenth illustrated embodiment, like numerals have, where possible, been used to denote like parts, albeit with the addition of the prefix "800" to indicate that these features belong to the tenth embodiment. The tenth embodiment shares many common features with the embodiment of Figures 10A, 10B and 14, therefore only the differences from the embodiment illustrated in Figures 10A, 10B and 14 will be described in any greater detail.

Figure 17 illustrate a portion of a blank 810. The blank 810 comprises at least one corner folding arrangement, substantially similar in arrangement to the corner folding arrangement of the embodiment of Figure 10. In the embodiment of Figure 17 the corner folding arrangement comprises a non-linear severance line 870. The severance line 870 separates the top panel 820 from the fourth top end closure flap 840b and separates the third corner panel 822 from the eighth gusset panel 842b and the fourth anchoring panel 844b.

The severance line 870 extends from the fold line 849b (also referred to herein as fourth fold line 849b) between the second side panel 824 and the fourth anchor panel 844b and comprises a first linear section 870a obliquely oriented with respect to the fourth fold line 849b.

The severance line 870 comprises a second linear section 870b continuous with the first linear section 870a. The second section 870b is divergently arranged with respect to the first linear section 870a so as to define a non-linear cut. The second section 870b may be oriented substantially perpendicular to the third fold line 845b.

The second section 870b extends across or intersects the fold line 821 between the third corner panel 822 and the top panel 820.

The second section 870b extends across or intersects the third fold line 845b between the fourth top end closure flap 840b and the eighth gusset panel 842b.

The notional vertex V defined by a notional extension N2 of the first fold line 843b and the second fold line 821 is disposed on a first side of the second section 870b of the severance line 870. The notional vertex V is spaced apart from the second section 870b of the severance line 870.

The second section 870b of the severance line 870 intersects or traverses the third fold line 845b at a point of intersection P. The point of intersection P is spaced apart from the notional vertex V.

The second section 870b may terminate or intersect the first fold line 843b.

In the embodiment of Figure 17 the fold line 823 between the third corner pane l822 and the second side panel 824 is disposed closer to the second fold line 821 than a the point of intersection between the first section 870a and the fourth fold line 849b.

Referring now to Figures 11, 15A and 15B there is shown an alternative embodiment of the present disclosure. 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 seventh embodiment.

Figure 11 shows a blank 610 for forming a carrier, the blank 610 comprises a plurality of main panels 612, 614, 616, 618, 620, 622, 624 for forming a tubular structure. The plurality of main panels 612, 614, 616, 618, 620, 622, 624 comprises; a first base panel 612, a first lower corner panel 614, a first side panel 616, a top panel 618, a second side panel 620, a second lower corner panel 622, and a second base panel 624. The plurality of main panels 612, 614, 616, 618, 620, 622, 624 may be arranged in a linear series hinged one to the next by corresponding fold lines 613, 615, 617, 619, 621, 623.

The first and second lower corner panels 614, 622 may be considered to form part of a bottom wall of the carrier 690 along with the first and second base panels 612, 624. Alternatively, the first and second lower corner panels 614, 622 may be considered to form a lower portion of a respective one of the first and second side panels 616, 620. In some embodiments the first and second lower corner panels 614, 622 may be omitted, in such embodiments the fold lines 615 and 621 may be omitted.

The blank 610 may comprise a complementary locking mechanism for securing the second base panel 624 to the first base panel 612. The second base panel 624 may comprise at least one first part M of the complementary locking mechanism. The first base panel 612 may comprise at least one second part F of the complementary locking mechanism.

The blank 610 comprises an optional carrying handle structure H. The handle structure H comprises a pair of foldable tabs 660a, 660b. The tabs 660a, 660b are spaced apart from each other. The tabs 660a, 660b are hingedly connected to the top panel 618 by fold lines 661a, 661b and are defined in part by a cut line or severance line 663a, 663b. Each of the severance lines 663a, 663b may extend into one or both of the first and second upper side panels 616, 620. The A first one of the tabs 660a is hingedly connected to the top panel 618 in opposition to a second one of the tabs 660b.

The blank 610 comprises at least one end closure structure for at least partially closing an end of a tubular structure defined by the plurality of panels 612, 614, 616, 618, 620, 622, 624. The blank 610 comprises a first end closure structure comprising a plurality of end closure panels 626a, 628a, 630a, 632a, 634a.

The first end closure structure comprises a first top end closure flap 630a hingedly connected to the top panel 618 by a fold line 637a.

A first gusset panel 628a is hingedly connected to the first top end closure flap 630a by a hinged connection in the form of a fold line 629a.

A first anchor panel 626a is hingedly connected to the first gusset panel 628a by a hinged connection in the form of a fold line 627a. The first anchor panel 626a is hingedly connected to the first side panel 616 by a hinged connection in the form of a fold line 625a.

A second gusset panel 632a is hingedly connected to the first top end closure flap 630a by a hinged connection in the form of a fold line 631a.

A second anchor panel 634a is hingedly connected to the second gusset panel 632a by a hinged connection in the form of a fold line 633a. The second anchor panel 634a is hingedly connected to the second side panel 620 by a hinged connection in the form of a fold line 635a. The blank 610 comprises a second end closure structure comprising a plurality of end closure panels 626b, 628b, 630b, 632b, 634b.

The second end closure structure comprises a second top end closure flap 630b hingedly connected to the top panel 618 by a fold line 637b.

A third gusset panel 628b is hingedly connected to the second top end closure flap 630b by a hinged connection in the form of a fold line 629b.

A third anchor panel 626b is hingedly connected to the third gusset panel 628b by a hinged connection in the form of a fold line 627b. The third anchor panel 626b is hingedly connected to the first side panel 616 by a hinged connection in the form of a fold line 625b.

A fourth gusset panel 632b is hingedly connected to the second top end closure flap 630b by a hinged connection in the form of a fold line 631b.

A fourth anchor panel 634b is hingedly connected to the fourth gusset panel 632b by a hinged connection in the form of a fold line 633b. The fourth anchor panel 634b is hingedly connected to the second side panel 620 by a hinged connection in the form of a fold line 635b.

The blank 610 comprises four corner folding arrangements at each corner of the top panel 618, the corner folding arrangements are substantially the same and will be described with regard to an enlarged view of one of the corner arrangements shown in Figure 11.

The corner folding arrangement comprises a severance line 670 in the form of a cut line. The severance line 670 extends across or intersects the fold line 619 between the top panel 618 and the second side panel 620, this fold line is also referred to herein as second fold line 619.

The severance line 670 extends from the fold line 635b between the second side panel 620 and the fourth anchoring panel 634b, the fold line 635b is also referred to herein as fourth fold line 635b.

The severance line 670 extends towards the fold line 637b between the top panel 618 and the second top end closure flap 630b. The severance line 670 may extend to the fold line 637b between the top panel 618 and the second top end closure flap 630b. The severance line 670 extends beyond or past the fold line 637b between the top panel 618 and the second top end closure flap 630b so as to extend into the top panel 618. The fold line 637b is also referred to herein as first fold line 637b.

The severance line 670 extends across or through the fold line 631b between the second top end closure panel 630b and the fourth gusset panel 632b, this fold line is also referred to herein as third fold line 631b.

The severance line 670 extends across or through the fold line 633b between the fourth anchoring panel 634b and the fourth gusset panel 632b, this fold line is also referred to herein as fifth fold line 633b.

The severance line 670 can be considered to intersect or terminate each of the first, second, third, fourth and fifth fold lines 637b, 619, 631b, 635b, 633b.

The severance line 670 in the illustrated embodiment is non-linear and may be curvilinear. In other embodiments the severance line 670 may be defined by two or more linear sections divergently arranged with respect to each other. In still other embodiments the severance line 670 may be linear.

The severance line 670 extends between the first fold line 637b and fourth fold line 635b.

The severance line 670 bypasses a notional intersection or vertex V between a notional extension of the first fold line 637b and the second fold line 619 such that the notional intersection V is located on one side of the severance line 670. The notional intersection V is located on a first side of the severance line 670 and the fourth anchoring panel 634b and the fourth gusset panel 632b are located on a second, opposing, side of the severance line 670. The notional intersection V may be spaced apart from the fourth anchoring panel 634b and the fourth gusset panel 632b.

The third fold line 631b, or a notional extension thereof, may intersect or pass through the notional vertex V. Notional extensions of the fourth and fifth fold lines 635b, 633b may intersect or pass through the notional vertex V.

The fifth fold line 633b may be interrupted by a "U" shaped cut line to define a tab portion struck from material which would otherwise form the fourth gusset panel 632b. The tab portion is integral with the fourth anchoring panel 634b.

The severance line 670 intersects with the third fold line 633b at a first intersection P. The first intersection P is disposed at a position closer to the fourth gusset panel 632b than the notional intersection V of the first fold line 637b and second fold line 619.

Referring now to Figure 12 there is shown an alternative embodiment of the present disclosure. 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 eighth embodiment shares many common features with the embodiment of Figures 11, 15A and 15B, therefore only the differences from the embodiment illustrated in Figures 11, 15A and 15B will be described in any greater detail.

Figure 12 shows a portion of a blank 710 for forming a carrier, the blank 710 comprises a plurality of main panels 716, 718, 720 for forming a tubular structure. The plurality of main panels 716, 718, 720 includes; a first side panel 716, a top panel 718 and a second side panel 720. The plurality of main panels 716, 718, 720 may be arranged in a linear series hinged one to the next by corresponding fold lines 717, 719.

The blank 710 comprises an optional carrying handle structure H. The handle structure H comprises a pair of foldable tabs 760a, 760b.

The blank 710 comprises at least one end closure structure for at least partially closing an end of a tubular structure defined by the plurality of panels 716, 718, 720. The blank 710 comprises a first end closure structure comprising a plurality of end closure panels 726a, 728a, 730a, 732a, 734a, 736a, 738a. The first end closure structure comprises a first top end closure flap 730a hingedly connected to the top panel 718 by a fold line 737a.

A first web panel 736a is hingedly connected to the first top end closure flap 730a by a hinged connection in the form of a fold line 737a. A first gusset panel 728a is hingedly connected to the first web panel 736a by a hinged connection in the form of a fold line 729a.

A first anchor panel 726a is hingedly connected to the first gusset panel 728a by a hinged connection in the form of a fold line 727a. The first anchor panel 726a is hingedly connected to the first side panel 716 by a hinged connection in the form of a fold line 725a.

A second web panel 738a is hingedly connected to the first top end closure flap 730a by a hinged connection in the form of a fold line 739a. A second gusset panel 732a is hingedly connected to the second web panel 738a by a hinged connection in the form of a fold line 731a.

A second anchor panel 734a is hingedly connected to the second gusset panel 732a by a hinged connection in the form of a fold line 733a. The second anchor panel 734a is hingedly connected to the second side panel 720 by a hinged connection in the form of a fold line 735a.

The blank 710 comprises a second end closure structure comprising a plurality of end closure panels 726b, 728b, 730b, 732b, 734b, 736b, 738b. The second end closure structure comprises a second top end closure flap 730b hingedly connected to the top panel 718 by a fold line 737b.

A third web panel 736b is hingedly connected to the second top end closure flap 730b by a hinged connection in the form of a fold line 737b. A third gusset panel 728b is hingedly connected to the third web panel 736b by a hinged connection in the form of a fold line 729b.

A third anchor panel 726b is hingedly connected to the third gusset panel 728b by a hinged connection in the form of a fold line 727b. The third anchor panel 726b is hingedly connected to the first side panel 616 by a hinged connection in the form of a fold line 725b.

A fourth web panel 738b is hingedly connected to the second top end closure flap 730b by a hinged connection in the form of a fold line 739b. A fourth gusset panel 732b is hingedly connected to the fourth web panel 738b by a hinged connection in the form of a fold line 731b.

A fourth anchor panel 734b is hingedly connected to the fourth gusset panel 732b by a hinged connection in the form of a fold line 733b. The fourth anchor panel 734b is hingedly connected to the second side panel 720 by a hinged connection in the form of a fold line 735b.

Figure 12 illustrate a portion of a blank 710. The blank 710 comprises four corner folding arrangements, substantially similar in arrangement to the corner folding arrangements of the embodiment of Figure 11. In the embodiment of Figure 12 the corner folding arrangements each comprise an additional fold line 757a, 757b, 757c, 757d. The fold lines 757a, 757b, 757c, 757d are provided in respective ones of the first and second top end closure panel 730a, 730b and extend divergently with respect to third fold lines 729a, 729b, 731a, 731b. The fold lines 757a, 757b, 757c, 757d may extend towards a notional vertex V defined by a respective one of the second fold lines 717, 719 and one of the first fold line 737a, 737b (or at least a notional extension of the first fold line 737a, 737b).

The present disclosure provides a corner folding arrangement comprising a first panel 18; 118; 218; 324; 420; 520; 618; 718; 820, second panel 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b and a third panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824. The first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 comprises a corner defined by an end edge and a side edge. The second panel 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b is hingedly connected to the end edge of the first panel along a first fold line 33b; 139b; 239b; 353b; 443b; 543b; 637b; 737b; 843b. The third panel 20; 120; 220; 322; 422/424; 522/524;

620; 720; 822/824 is hingedly connected to the side edge of the first panel along a second fold line 19; 19; 219; 323; 421; 521; 619; 719; 821. A fourth panel 34b; 142b; 242b; 344b; 442b; 542b; 632b; 732b; 842b is hinged to a fifth panel 36b; 144b; 244b; 342b; 444b; 544b; 634b; 734b; 844b. The fourth and fifth panel (also referred to herein as a pair of gusset panels) couple the second panel to the third panel. The fourth panel (also referred herein a gusset panel) is hingedly connected to the second panel 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b along a third fold line 35b; 143b; 243b; 351b; 445b; 545b; 631b; 731b; 845b. The fifth panel (also referred to herein as an anchoring panel) is hingedly connected to the third panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 along a fourth fold line 39b; 149b; 249b; 347b; 449b; 549b; 633b; 733b; 849b. A severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 extends between the first and fourth fold lines or between the second and third fold lines. In an unfolded blank form the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 bypasses a notional intersection V of the first and second fold lines such that the notional intersection V is located on one side of the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 spaced apart from the fourth and fifth panels.

Advantageously, the corner folding arrangement facilitate folding of a corner structure and provides an aesthetic appearance. The corner folding arrangement maintains the panels of the corner folding arrangement in an overlapping arrangement. The arrangement avoids creating a large opening into the interior. The severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 may open slightly however such opening is substantially concealed or disguised by projections T1, T2 of one or more of the panels of the corner folding arrangement.

The first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 and the third panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 may define in part a tubular structure, the second panel 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b may at least partially close an end of the tubular structure.

The present disclosure provides a carton 90; 190; 290; 390; 490; 690 for packaging articles B. The carton 990; 190; 290; 390; 490; 690 comprises a plurality of panels forming walls of a tubular structure including a top wall 18; 118; 218; 318; 420; 520; 618; 718; 820, a first side wall 16; 114/116; 214/216; 314; 416; 616; 716, a base wall 12/24; 112/124; 212/224; 312/324; 412/428; 612/624, and a second side wall 20; 120; 220; 322; 424; 524; 620; 720; 824,

optionally hingedly connected to each other in a linear series. The carton 90; 190; 290; 390; 490; 690 may comprise a carrying handle H defined in at least one of the plurality of panels.

The plurality of panels define an interior of the tubular structure for receiving one or more articles. The plurality of panels includes a first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 having a corner defined by an end edge and a side edge. A second panel 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b is hingedly connected to the end edge of the first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 along a first fold line 33b; 139b; 239b; 353b; 443b; 543b; 637b; 737b; 843b. A third panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 is hingedly connected to the side edge of the first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 along a second fold line 19; 19; 219; 323; 421; 521; 619; 719; 821. A fourth panel 34b; 142b; 242b; 344b; 442b; 542b; 632b; 732b; 842b is hinged to a fifth panel 36b; 144b; 244b; 342b; 444b; 544b; 634b; 734b; 844b. The fourth and fifth panel couple the second panel to the third panel. The fourth and fifth panels are disposed in the interior of the carton 90; 190; 290; 390; 490; 690. The fourth panel 34b; 142b; 242b; 344b; 442b; 542b; 632b; 732b; 842b is hingedly connected to the second panel 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b along a third fold line 35b; 143b; 243b; 351b; 445b; 545b; 631b; 731b; 845b. The fifth panel 36b; 144b; 244b; 342b; 444b; 544b; 634b; 734b; 844b is hingedly connected to the third panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 along a fourth fold line 39b; 149b; 249b; 347b; 449b; 549b; 633b; 733b; 849b. A severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 extends between the first and fourth fold lines or between the second and third fold lines. In an unfolded blank form the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 bypasses a notional intersection V of the first and second fold lines such that the notional intersection V is located on one side of the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 and is spaced apart from the fourth and fifth panels.

The present disclosure also provides a carton 90; 190; 290; 390; 490; 690 for packaging articles B. The carton 990; 190; 290; 390; 490; 690 comprises a plurality of panels forming walls of a tubular structure having an interior. The carton 90; 190; 290; 390; 490; 690 comprises a first wall 18; 118; 218; 324; 420; 520; 618; 718; 820 having an end edge and a side edge adjacent the end edge. A second wall 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b is adjacent to the first wall 18; 118; 218; 324; 420; 520; 618; 718; 820. The second wall 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b may be hingedly connected to the end edge of the first wall 18; 118; 218; 324; 420; 520; 618; 718; 820 along a first fold line 33b; 139b; 239b; 353b;

443b; 543b; 637b; 737b; 843b. A third wall 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 is adjacent to the first wall 18; 118; 218; 324; 420; 520; 618; 718; 820 and to the second wall 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b. The third wall 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 may be hingedly connected to the side edge of the first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 along a second fold line 19; 19; 219; 323; 421; 521; 619; 719; 82. A severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 extends at least between the first and second fold lines. The severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 is divergently arranged with respect to one of the first or second fold lines so as to define, at least in part, a projection T1 integral with the first wall 18; 118; 218; 324; 420; 520; 618; 718; 820 and extending outwardly from said one of the first or second fold lines.

A pair of gusset panels may be hingedly connected to each other by a fifth fold line. The pair of gusset panels couple the second panel to the third panel. The pair of gusset panels may be disposed in the interior of the carton.

A first gusset panel 34b; 142b; 242b; 344b; 442b; 542b; 632b; 732b; 842b may be hingedly connected to a side edge of the second wall 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b along a third fold line 35b; 143b; 243b; 351b; 445b; 545b; 631b; 731b; 845b. A portion of the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 extends at least between the first and third fold lines said portion of the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 is divergently arranged with respect to the third fold line 35b; 143b; 243b; 351b; 445b; 545b; 631b; 731b; 845b so as to define, at least in part, a projection T2. The projection T2 is integral with the second wall 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b and extends outwardly from the third fold line 35b; 143b; 243b; 351b; 445b; 545b; 631b; 731b; 845b.

A second gusset panel 36b; 144b; 244b; 342b; 444b; 544b; 634b; 734b; 844b may be hingedly connected to an end edge of the third wall 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 along a fourth fold line 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824. A portion of the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 extends at least between the fourth and second fold lines said portion of the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 is divergently arranged with respect to the fourth fold line 39b; 149b; 249b; 347b; 449b; 549b; 633b; 733b; 849b so as to define, at least in part a projection T2. The

projection T2 is integral with the third wall 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 and extends outwardly from the fourth fold line 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824.

The present disclosure also provides a blank 10; 110; 210; 310; 410; 510; 610; 710; 810 for forming a carton 90; 190; 290; 390; 490; 690. The blank 10; 110; 210; 310; 410; 510; 610; 710; 810 comprises plurality of panels forming walls of a tubular structure defining an interior. The plurality of panels includes a first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 having a corner defined by an end edge and a side edge. A second panel 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b is hingedly connected to the end edge of the first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 along a first fold line 33b; 139b; 239b; 353b; 443b; 543b; 637b; 737b; 843b. A third panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 is hingedly connected to the side edge of the first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 along a second fold line 19; 19; 219; 323; 421; 521; 619; 719; 821. A fourth panel 34b; 142b; 242b; 344b; 442b; 542b; 632b; 732b; 842b is hinged to a fifth panel 36b; 144b; 244b; 342b; 444b; 544b; 634b; 734b; 844b. The fourth and fifth panel couple the second panel to the third panel. The fourth and fifth panels are disposed in the interior of the carton 90; 190; 290; 390; 490; 690. The fourth panel 34b; 142b; 242b; 344b; 442b; 542b; 632b; 732b; 842b is hingedly connected to the second panel 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b along a third fold line 35b; 143b; 243b; 351b; 445b; 545b; 631b; 731b; 845b. The fifth panel 36b; 144b; 244b; 342b; 444b; 544b; 634b; 734b; 844b is hingedly connected to the third panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 along a fourth fold line 39b; 149b; 249b; 347b; 449b; 549b; 633b; 733b; 849b. A severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 extends between the first and fourth fold lines or between the second and third fold lines. In an unfolded blank form the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 bypasses a notional intersection V of the first and second fold lines such that the notional intersection V is located on one side of the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 and is spaced apart from the fourth and fifth panels.

The present disclosure also provides a blank 10; 110; 210; 310; 410; 510; 610; 710; 810 for forming a carton 90; 190; 290; 390; 490; 690. The blank 10; 110; 210; 310; 410; 510; 610; 710; 810 comprises a first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 having a corner defined by an end edge and a side edge. An end flap 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b is hingedly connected to the end edge of the first panel 18; 118; 218; 324; 420;

520; 618; 718; 820 along a first fold line 33b; 139b; 239b; 353b; 443b; 543b; 637b; 737b; 843b for at least partially closing an end of the carton 90; 190; 290; 390; 490; 690. A side panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 is hingedly connected to the side edge of the first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 along a second fold line 19; 19; 219; 323; 421; 521; 619; 719; 821. A pair of first and second hinged gusset panels extend between the end flap 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b and the side panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 for placement under one of the end flap 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b and the side panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 when the carton 90; 190; 290; 390; 490; 690 is erected. The first gusset panel 34b; 142b; 242b; 344b; 442b; 542b; 632b; 732b; 842b is hingedly connected to the end flap 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b along a third fold line 35b; 143b; 243b; 351b; 445b; 545b; 631b; 731b; 845b. The second gusset panel is hingedly connected to the side panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 along a fourth fold line 39b; 149b; 249b; 347b; 449b; 549b; 633b; 733b; 849b. A severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 extends between the first and fourth fold lines or between the second and third fold lines. The severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 bypasses a notional intersection V of the first and second fold lines such that the notional intersection V is located on one side of the severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 spaced apart from the first and second gusset panels.

The present disclosure also provides a blank 10; 110; 210; 310; 410; 510; 610; 710; 810 for forming a carton 90; 190; 290; 390; 490; 690. The blank 10; 110; 210; 310; 410; 510; 610; 710; 810 comprises a first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 having a corner defined by an end edge and a side edge. An end flap 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b is hingedly connected to the end edge of the first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 along a first fold line 33b; 139b; 239b; 353b; 443b; 543b; 637b; 737b; 843b for at least partially closing an end of the carton 90; 190; 290; 390; 490; 690. A side panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 is hingedly connected to the side edge of the first panel 18; 118; 218; 324; 420; 520; 618; 718; 820 along a second fold line 19; 19; 219; 323; 421; 521; 619; 719; 821. A pair of first and second hinged gusset panels extend between the end flap 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b and the side panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 for placement under one of the end flap 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b and the side panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 when the carton 90; 190; 290; 390; 490; 690 is erected.

The first gusset panel 34b; 142b; 242b; 344b; 442b; 542b; 632b; 732b; 842b is hingedly connected to the end flap 32b; 138b; 328b; 346b; 440b; 540b; 630b; 730b; 840b along a third fold line 35b; 143b; 243b; 351b; 445b; 545b; 631b; 731b; 845b. The second gusset panel is hingedly connected to the side panel 20; 120; 220; 322; 422/424; 522/524; 620; 720; 822/824 along a fourth fold line 39b; 149b; 249b; 347b; 449b; 549b; 633b; 733b; 849b. A severance line 70; 170; 270; 370; 470; 570; 670; 770; 870 extends between the first and fourth fold lines or between the second and third fold lines. The severance line intersects 70; 170; 270; 370; 470; 570; 670; 770; 870 with at least the third or fourth fold line at a first intersection P, P2 such that the first intersection P, P2 is disposed at a position closer to the first gusset panel 34b; 142b; 242b; 344b; 442b; 542b; 632b; 732b; 842b than a notional intersection V of the first and second fold lines.

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.

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

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

combination of a linear fold line and an arched or arcuate fold line which intersect at two points such that they define a half moon-shaped panel therebetween.

As used herein, the term "fold line" may refer to one of the following: a scored line, an embossed line, a debossed line, a line of perforations, a line of short slits, a line of half-cuts, a single half-cut, an interrupted cutline, a line of aligned slits, a line of scores and any combination of the aforesaid options.

It should be understood that hinged connections and fold lines can each include elements that are formed in the substrate of the blank including perforations, a line of perforations, a line of short slits, a line of half-cuts, a single half-cut, a cutline, an interrupted cutline, 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.

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

CLAIMS

1. A corner folding arrangement comprising

a first panel having a corner defined by an end edge and a side edge;

a second panel hingedly connected to the end edge of the first panel along a first fold line;

a third panel hingedly connected to the side edge of the first panel along a second fold line;

a fourth panel; and

a fifth panel hinged to the fourth panel, the fourth and fifth panel coupling the second panel to the third panel;

wherein the fourth panel is hingedly connected to the second panel along a third fold line and the fifth panel is hingedly connected to the third panel along a fourth fold line, and wherein a severance line extends between the first and fourth fold lines or between the second and third fold lines, in an unfolded blank form the severance line bypasses a notional intersection of the first and second fold lines such that the notional intersection is located on one side of the severance line spaced apart from the fourth and fifth panels.

2. A carton for packaging one or more articles comprising a plurality of panels forming walls of a tubular structure having an interior, the plurality of panels including:

a first panel having a corner defined by an end edge and a side edge;

a second panel hingedly connected to the end edge of the first panel along a first fold line;

a third panel hingedly connected to the side edge of the first panel along a second fold line;

a fourth panel; and

a fifth panel hinged to the fourth panel, the fourth and fifth panel coupling the second panel to the third panel, the fourth and fifth panels disposed in the interior of the carton;

wherein the fourth panel is hingedly connected to the second panel along a third fold line and the fifth panel is hingedly connected to the third panel along a fourth fold line, and wherein a severance line extends between the first and fourth fold lines or between the second and third fold lines, in an unfolded blank form the severance line bypasses a notional intersection of the first and second fold lines such that the notional intersection is located on one side of the severance line spaced apart from the fourth and fifth panels.

3. A carton for packaging one or more articles comprising a plurality of panels forming walls of a tubular structure having an interior, the carton comprising:

a first wall having an end edge and a side edge adjacent the end edge;

a second wall hingedly connected to the end edge of the first wall along a first fold line;

a third wall hingedly connected to the side edge of the first wall along a second fold line;

wherein a severance line extends at least between the first and second fold lines, the severance line being divergently arranged with respect to one of the first or second fold lines so as to define, at least in part, a projection integral with the first wall and extending outwardly from said one of the first or second fold lines.

4. A carton according to claim 3 wherein the carton comprises a pair of gusset panels hingedly connected to each other by a fifth fold line, the pair of gusset panels coupling the second panel to the third panel, the pair of gusset panels being disposed in the interior of the carton.

5. A carton according to claim 3 wherein the carton comprises a first gusset panel hingedly connected to a side edge of the second wall along a third fold line, a portion of the severance line extends at least between the first and third fold lines said portion of the severance line being divergently arranged with respect to the third fold line so as to define, at least in part, a projection integral with the second wall and extending outwardly from the third fold line.

6. A carton according to claim 3 wherein the carton comprises a second gusset panel hingedly connected to an end edge of the third wall along a fourth fold line, a portion of the severance line extends at least between the fourth and second fold lines said portion of the severance line being divergently arranged with respect to the fourth fold line so as to define, at least in part, a projection integral with the third wall and extending outwardly from the fourth fold line.

7. A blank for forming a carton, the blank comprising plurality of panels forming walls of a tubular structure defining an interior, the plurality of panels including:

a first panel having a corner defined by an end edge and a side edge;

a second panel hingedly connected to the end edge of the first panel along a first fold line;

a third panel hingedly connected to the side edge of the first panel along a second fold line; and

a fourth panel; and

a fifth panel hinged to the fourth panel, the fourth and fifth panel coupling the second panel to the third panel, the fourth and fifth panels disposed in the interior when the carton is erected;

wherein the fourth panel is hingedly connected to the second panel along a third fold line and the fifth panel is hingedly connected to the third panel along a fourth fold line, and wherein a severance line extends between the first and fourth fold lines or between the second and third fold lines, the severance line bypasses a notional intersection of the first and second fold lines such that the notional intersection is located on one side of the severance line spaced apart from the fourth and fifth panels.

8. A blank for forming a carton, the blank comprising:

a first panel having a corner defined by an end edge and a side edge;

an end flap hingedly connected to the end edge of the first panel along a first fold line for at least partially closing an end of the carton;

a side panel hingedly connected to the side edge of the first panel along a second fold line; and

a pair of first and second hinged gusset panels extending between the end flap and the side panel for placement under one of the end flap and the side panel when the carton is erected;

wherein the first gusset panel is hingedly connected to the end flap along a third fold line and the second gusset panel is hingedly connected to the side panel along a fourth fold line, and wherein a severance line extends between the first and fourth fold lines or between the second and third fold lines, the severance line bypasses a notional intersection of the first and second fold lines such that the notional intersection is located on one side of the severance line spaced apart from the first and second gusset panels.

9. A blank for forming a carton, the blank comprising:

a first panel having a corner defined by an end edge and a side edge;

an end flap hingedly connected to the end edge of the first panel along a first fold line for at least partially closing an end of the carton;

a side panel hingedly connected to the side edge of the first panel along a second fold line; and

a pair of first and second hinged gusset panels extending between the end flap and the side panel for placement under one of the end flap and the side panel when the carton is erected,

wherein the first gusset panel is hingedly connected to the end flap along a third fold line and the second gusset panel is hingedly connected to the side panel along a fourth fold line, and wherein a severance line extends between the first and fourth fold lines or between the second and third fold lines, the severance line intersects with at least the third or fourth fold line at a first intersection such that the first intersection is disposed at a position closer to the first gusset panel than a notional intersection of the first and second fold lines.

10. A blank according to either of claims 8 or 9 wherein the severance line is linear.

11. A blank according to either of claims 8 or 9 wherein the severance line is non-linear.

12. A blank according to either of claims 11 wherein the severance line is curvilinear.

13. A blank according to either of claims 11 wherein the severance line is arcuate.

14. A blank according to either of claims 11 wherein the severance line comprises at least two sections arranged divergently with respect to each other.

15. A blank according to either of claims 11 wherein the severance line comprises at least two contiguous sections arranged divergently with respect to each other.

16. A blank according to either of claims 8 or 9 wherein the end flap comprises one or more additional fold lines.

17. A blank according to either of claims 8 or 9 wherein the first panel comprises one or more additional fold lines.

18. A blank according to either of claims 8 or 9 wherein the severance line extends into the first panel.

19. A blank according to either of claims 8 or 9 wherein the severance line extends into the side panel.

20. A blank according to either of claims 8 or 9 wherein the severance line extends into the end flap.

21. A blank according to either of claims 8 or 9 wherein the severance line is convex when viewed from the first gusset panel.

22. A blank according to either of claims 8 or 9 wherein the severance line is concave when viewed from the first gusset panel.

23. A blank according to either of claims 8 or 9 wherein the second gusset panel forms an anchoring panel.

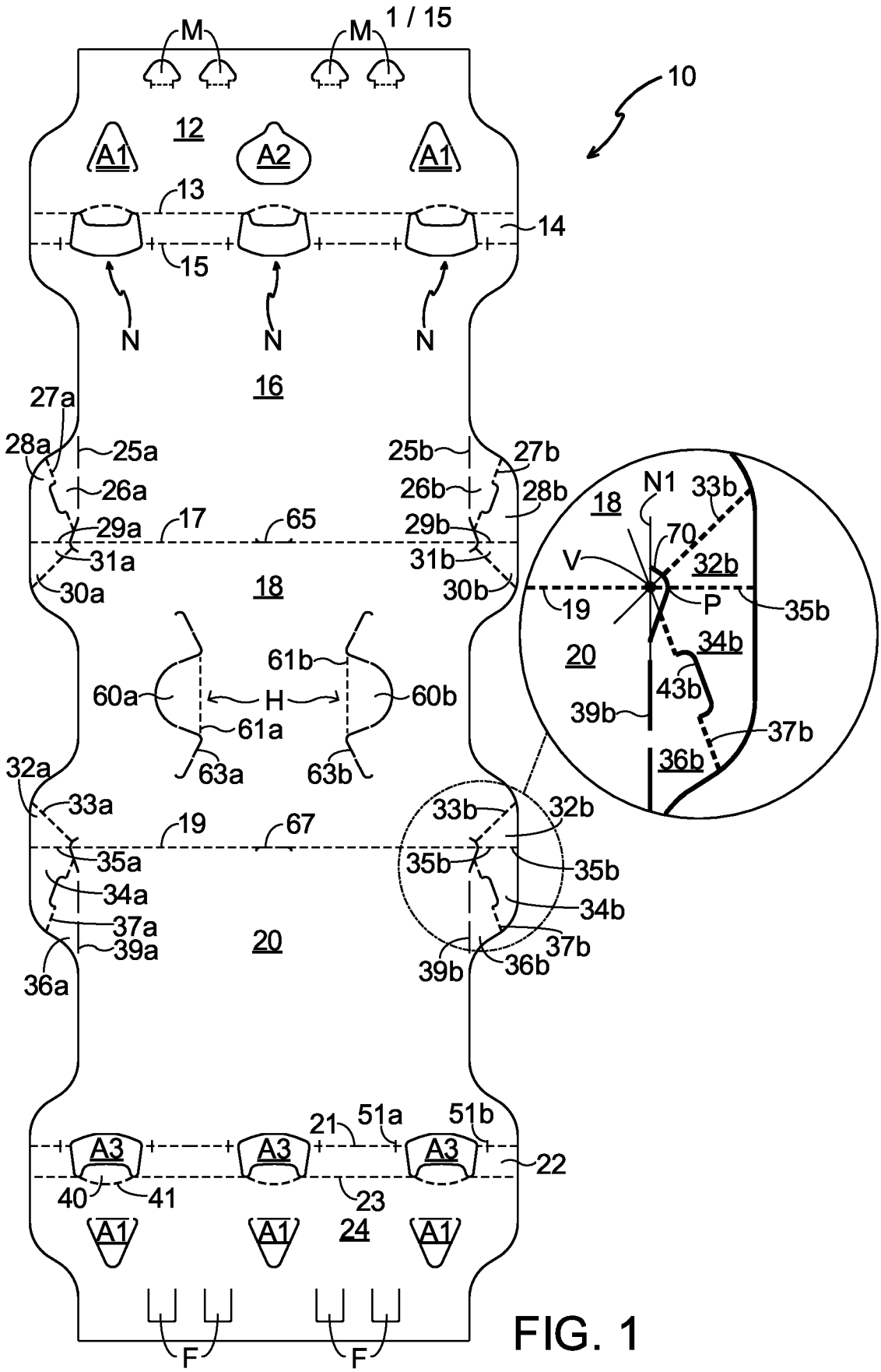

M
M
10
12
A1
A2
A1
13
14
15
N
N
N
16
27a
28a
25a
26a
29a
17
65
31a
30a
18
25b
27b
26b
28b
29b
31b
30b
61b
60a
H
60b
61a
63a
63b
32a
33a
19
67
35a
34a
37a
39a
36a
20
33b
32b
35b
35b
34b
37b
39b
36b
A3
A3
A3
21
51a
51b
22
40
41
23
24
A1
A1
A1
F
F
18
N1
33b
70
V
32b
19
P
35b
20
34b
43b
39b
37b
36b

FIG. 1

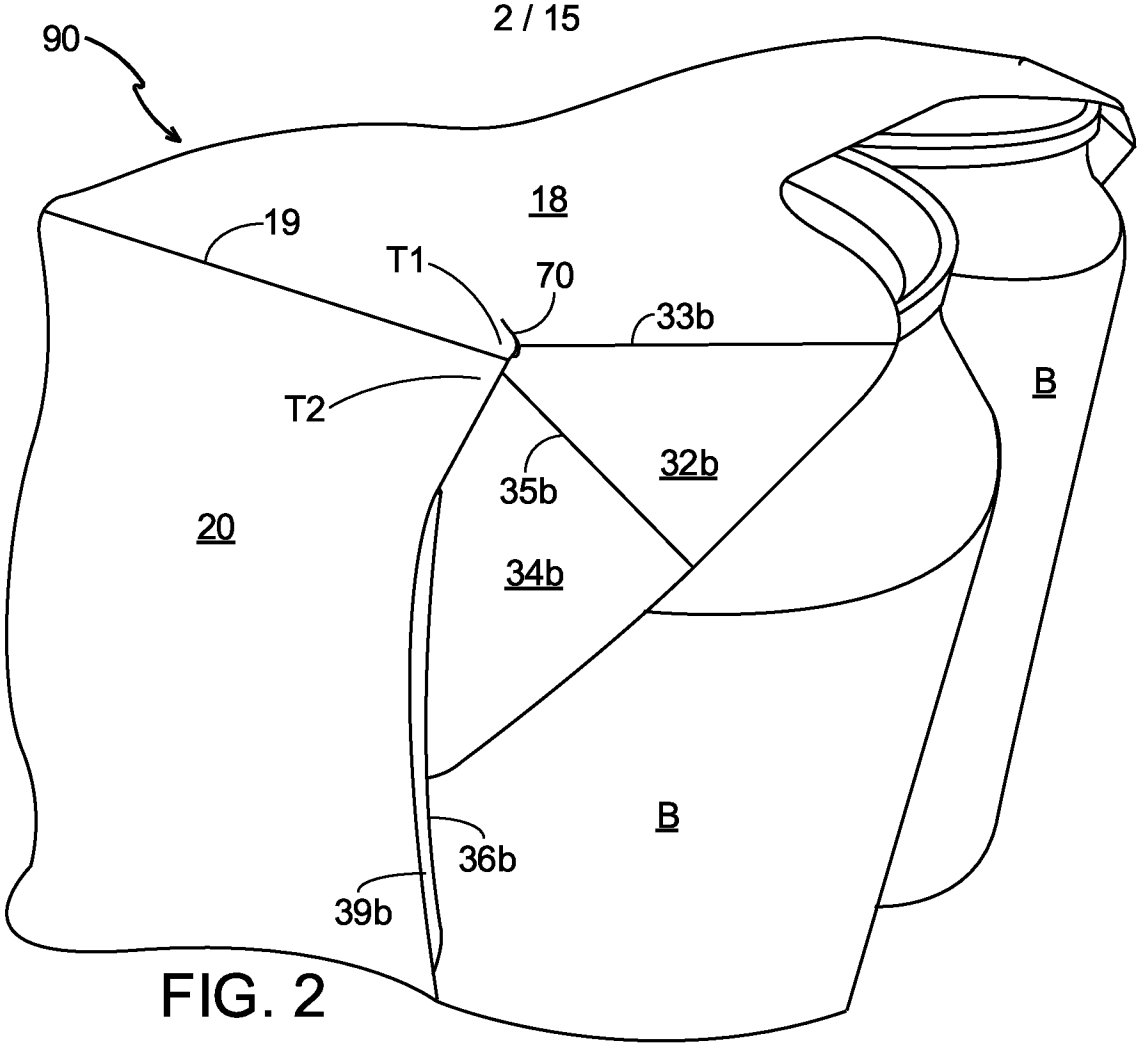

90
18
19
T1
70
33b
T2
B
32b
35b
20
34b
B
36b
39b

FIG. 2

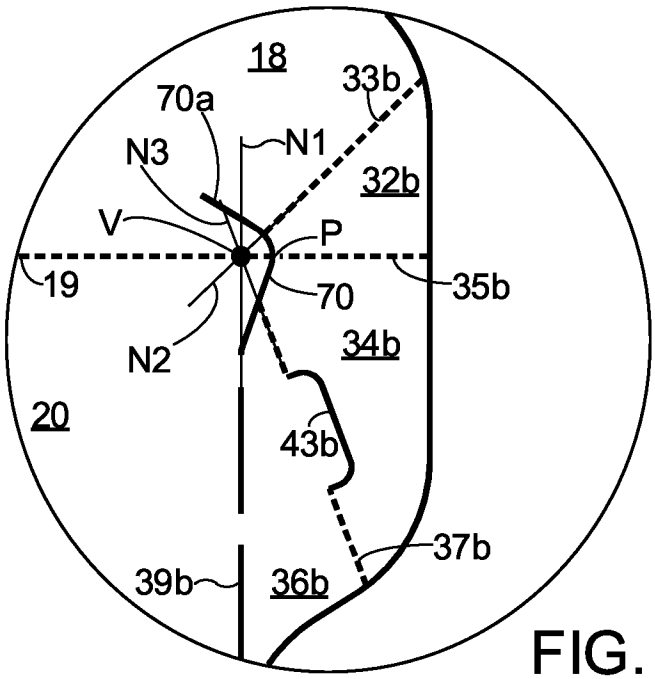

18
33b
70a
N1
N3
32b
V
P
19
70
35b
34b
N2
20
43b
37b
39b
36b

FIG. 16

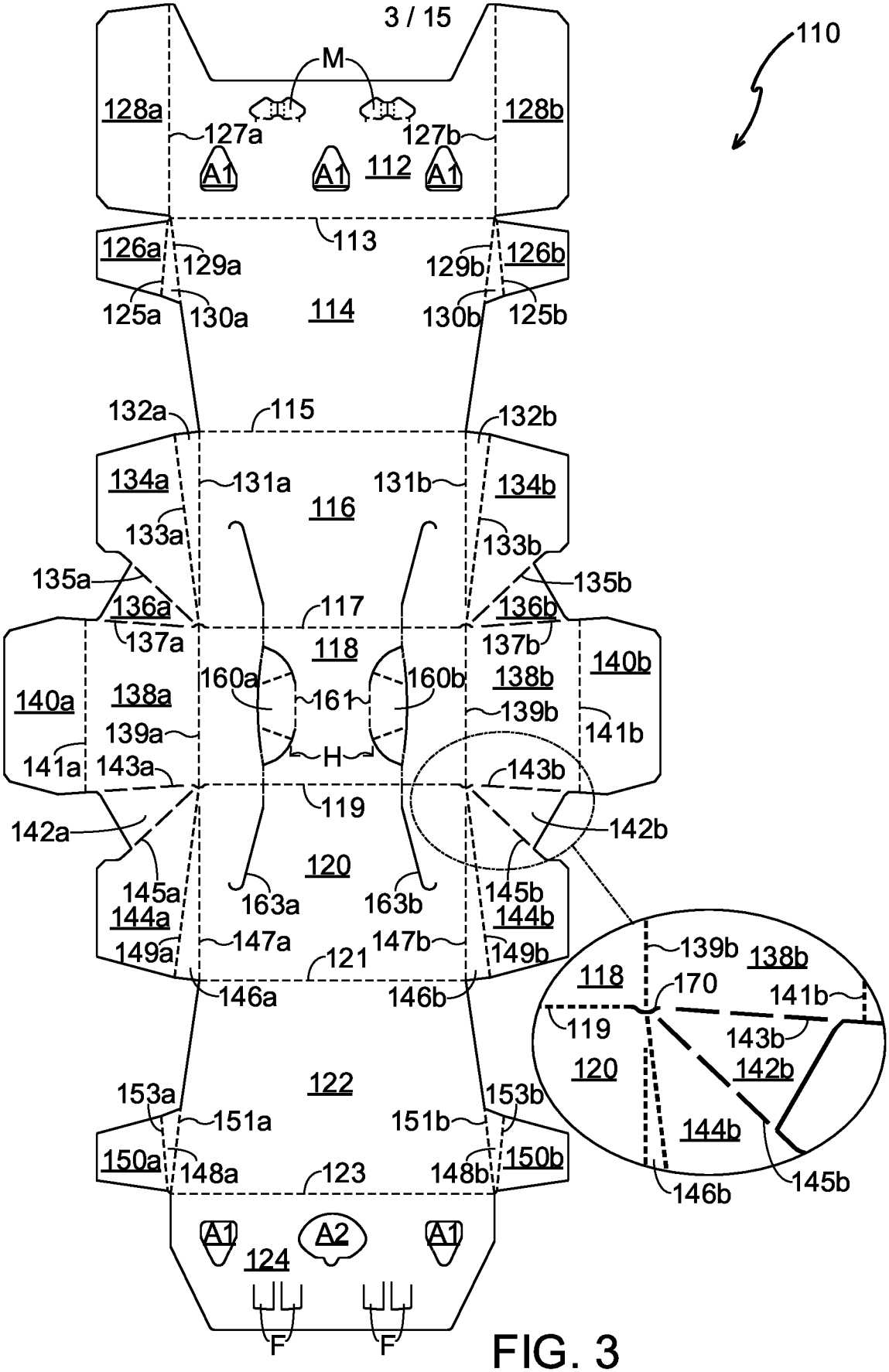

110
M
128a
128b
127a
127b
A1
A1
112
A1
113
126a
129a
129b
126b
125a
130a
114
130b
125b
132a
115
132b
134a
131a
131b
134b
116
133a
133b
135a
135b
136a
117
136b
137a
118
137b
140b
160a
160b
138b
140a
138a
161
139b
139a
141b
H
141a
143a
143b
119
142a
142b
120
145a
163a
163b
145b
144a
144b
149a
147a
147b
149b
121
146a
146b
122
153a
151a
151b
153b
150a
148a
123
148b
150b
A1
A2
A1
124
F
F
139b
138b
118
170
141b
119
143b
120
142b
144b
146b
145b

FIG. 3

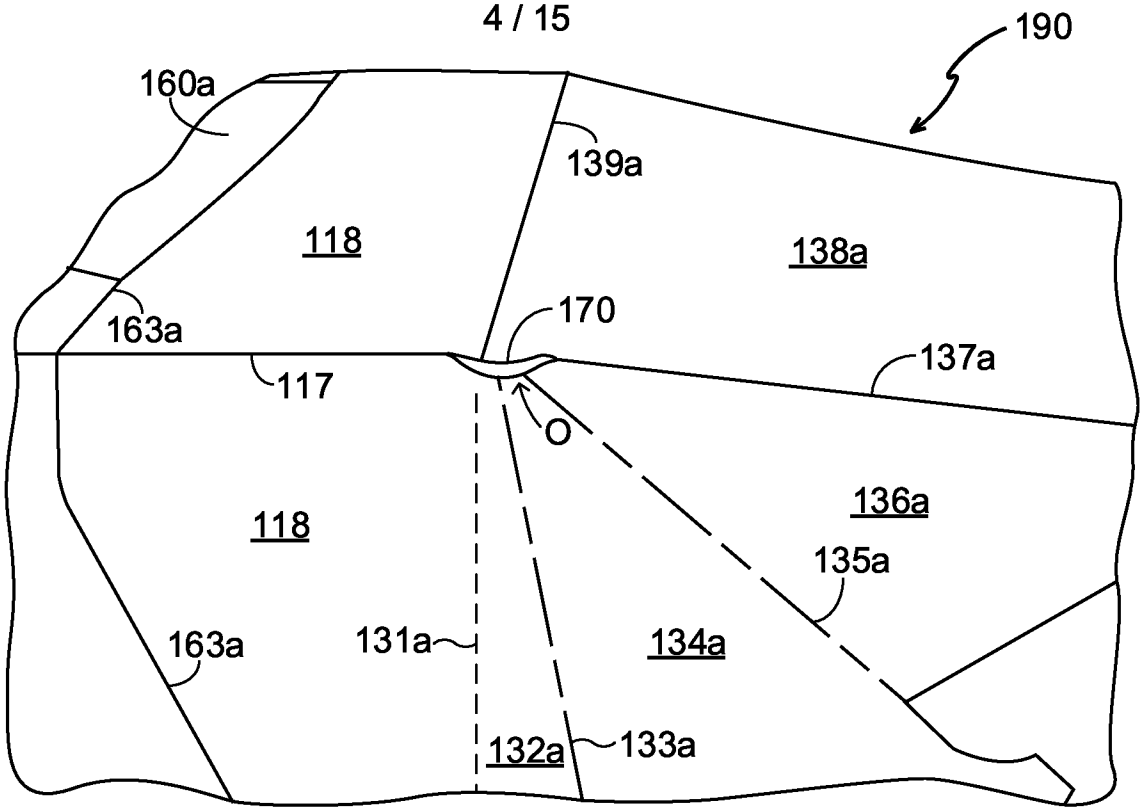

190
160a
139a
118
138a
163a
170
137a
117
O
118
136a
135a
163a
131a
134a
132a
133a

FIG. 4

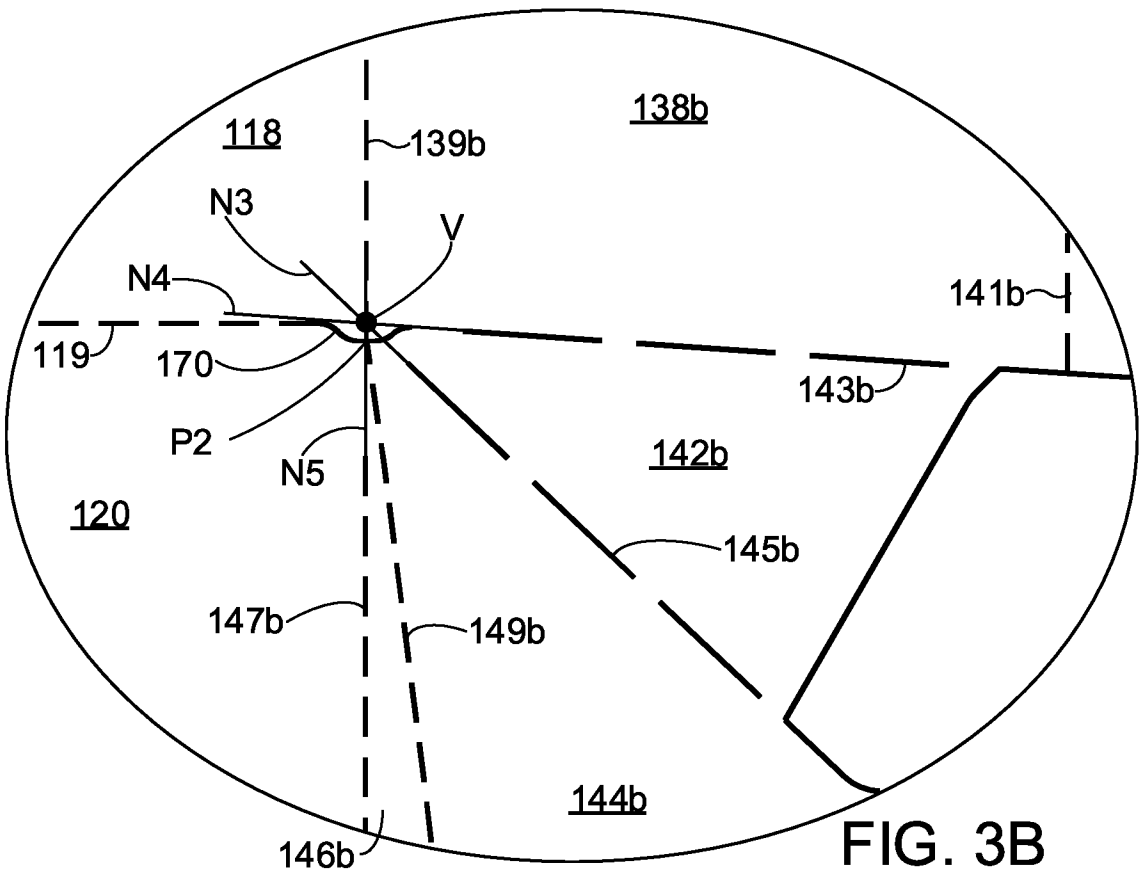

138b
118
139b
N3
V
N4
141b
119
170
143b
P2
N5
142b
120
145b
147b
149b
144b
146b

FIG. 3B

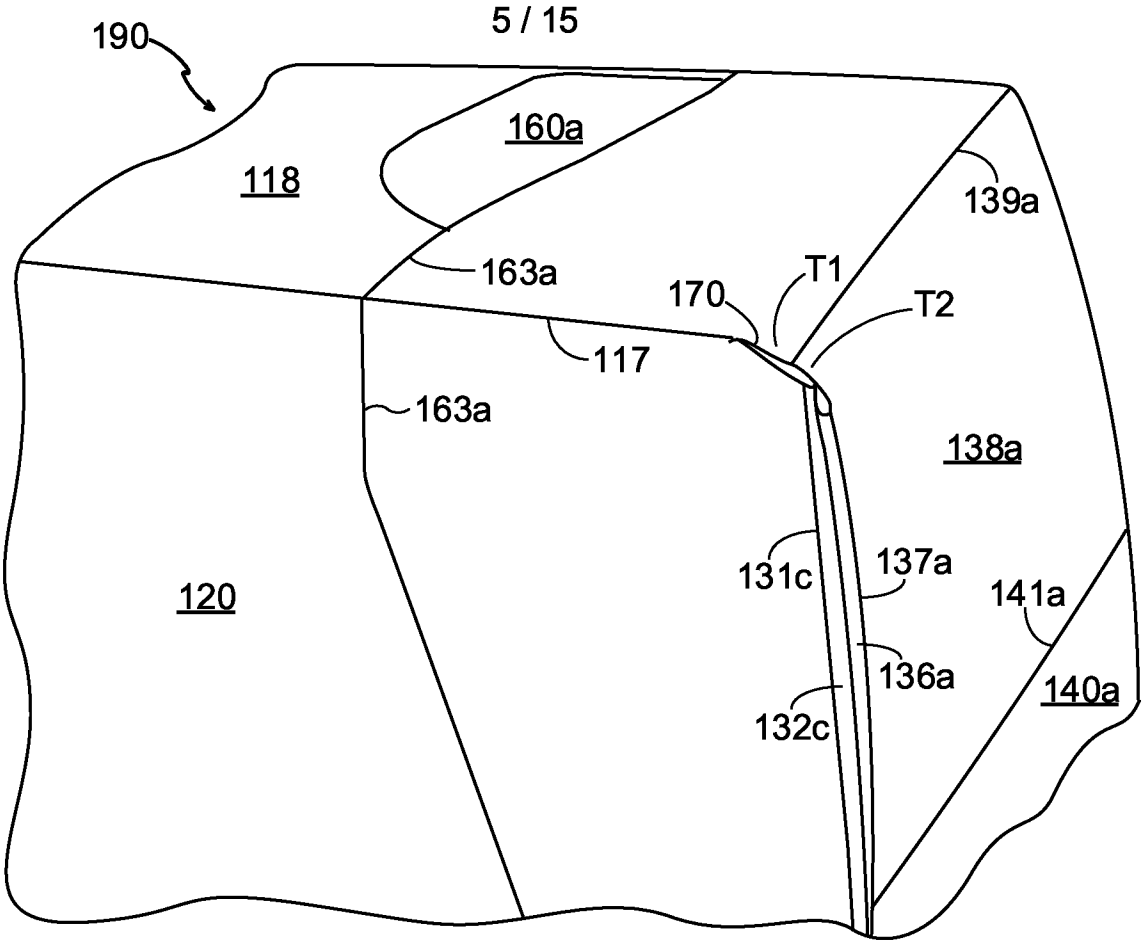

190
160a
118
139a
163a
T1
170
T2
117
163a
138a
131c
137a
141a
120
136a
140a
132c

FIG. 5

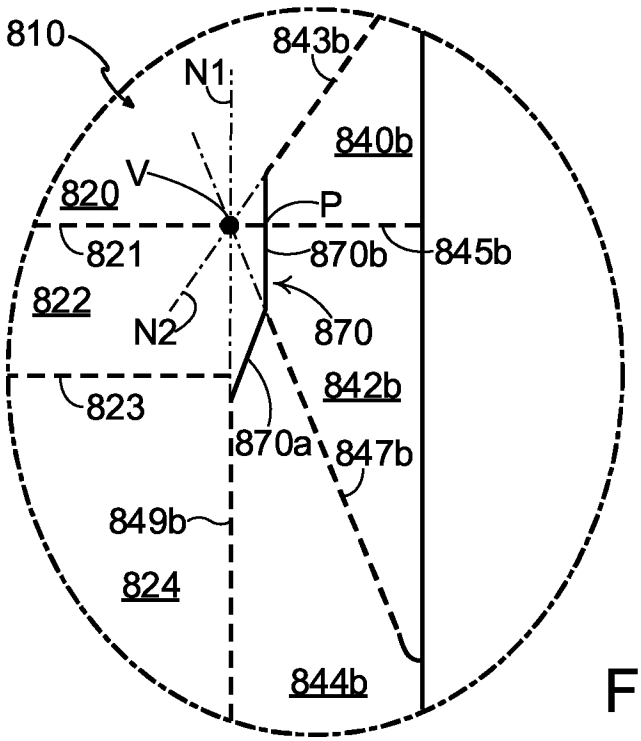

810
843b
N1
840b
V
820
P
821
870b
845b
822
N2
870
823
842b
870a
847b
849b
824
844b

FIG. 17

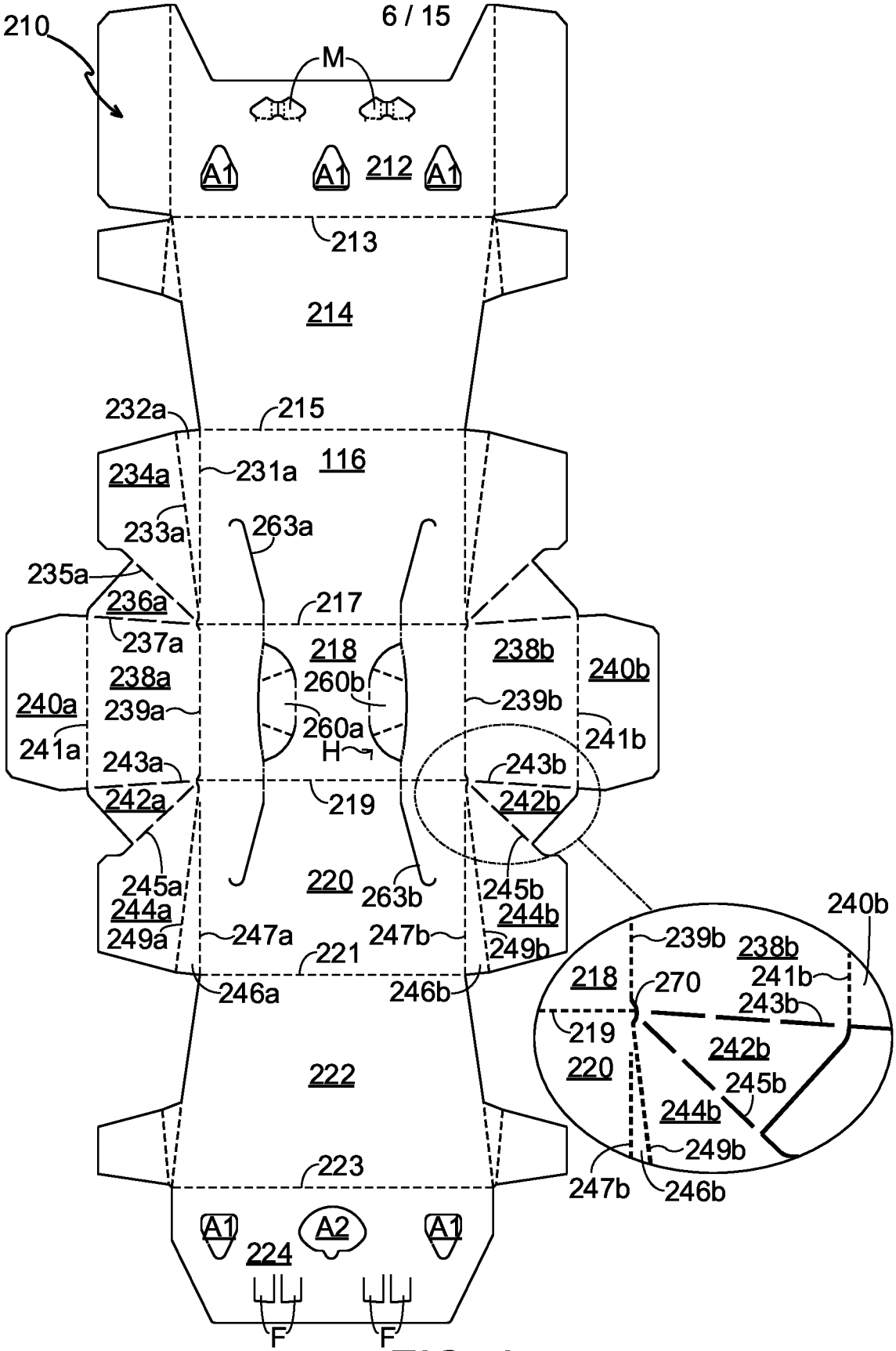

210
M
A1
A1
212
A1
213
214
232a
215
234a
231a
116
233a
263a
235a
236a
217
237a
218
238b
240b
238a
260b
239b
240a
239a
260a
241b
241a
243a
H
243b
242a
219
242b
245a
220
263b
245b
244a
244b
249a
247a
247b
249b
221
246a
246b
222
223
A1
A2
A1
224
F
F
240b
239b
238b
218
270
241b
243b
219
242b
220
245b
244b
249b
247b
246b

FIG. 6

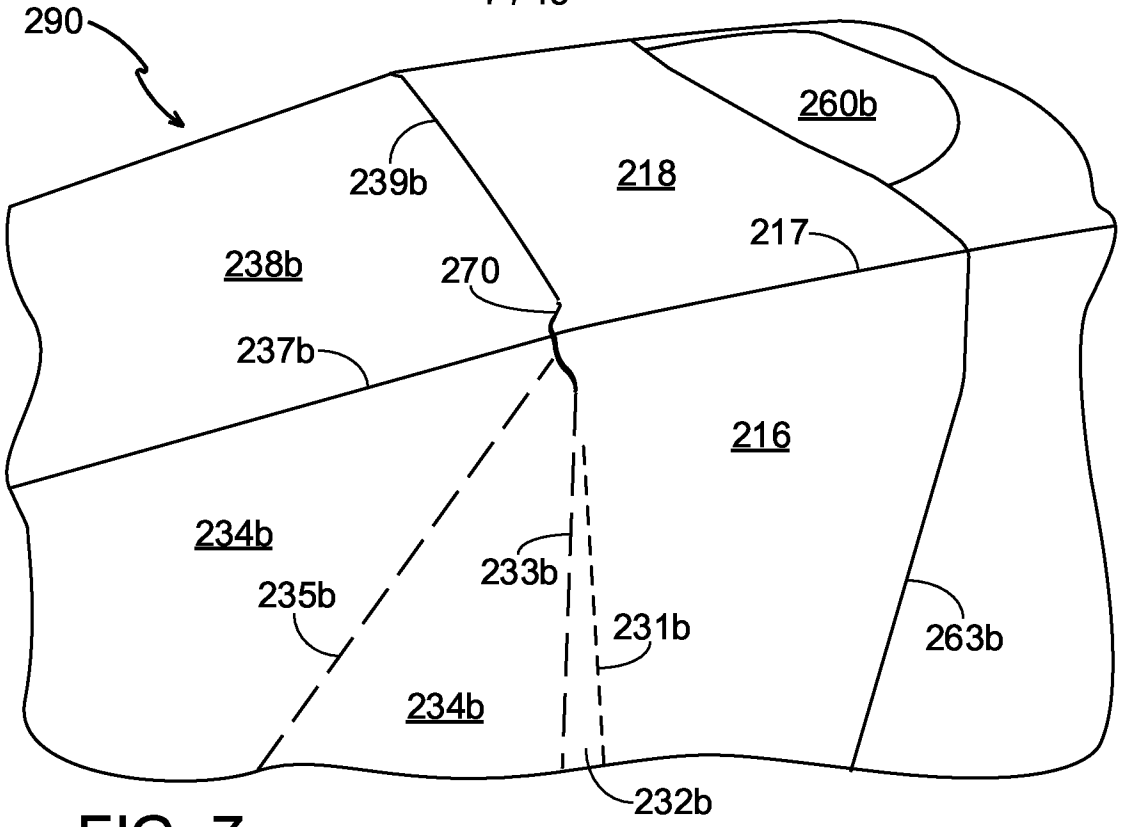

290
260b
239b
218
217
238b
270
237b
216
234b
233b
235b
231b
263b
234b
232b

FIG. 7

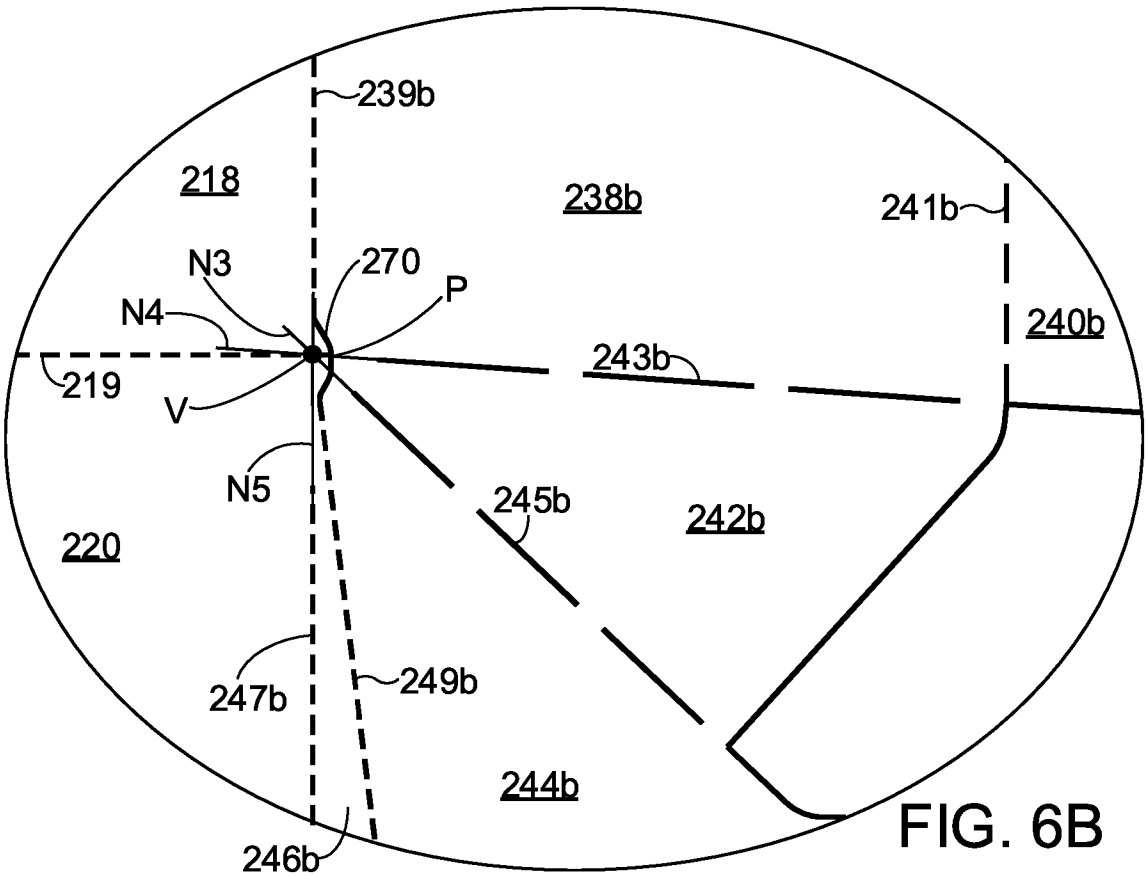

239b
218
238b
241b
N3
270
P
N4
240b
243b
219
V
N5
245b
242b
220
247b
249b
244b
246b

FIG. 6B

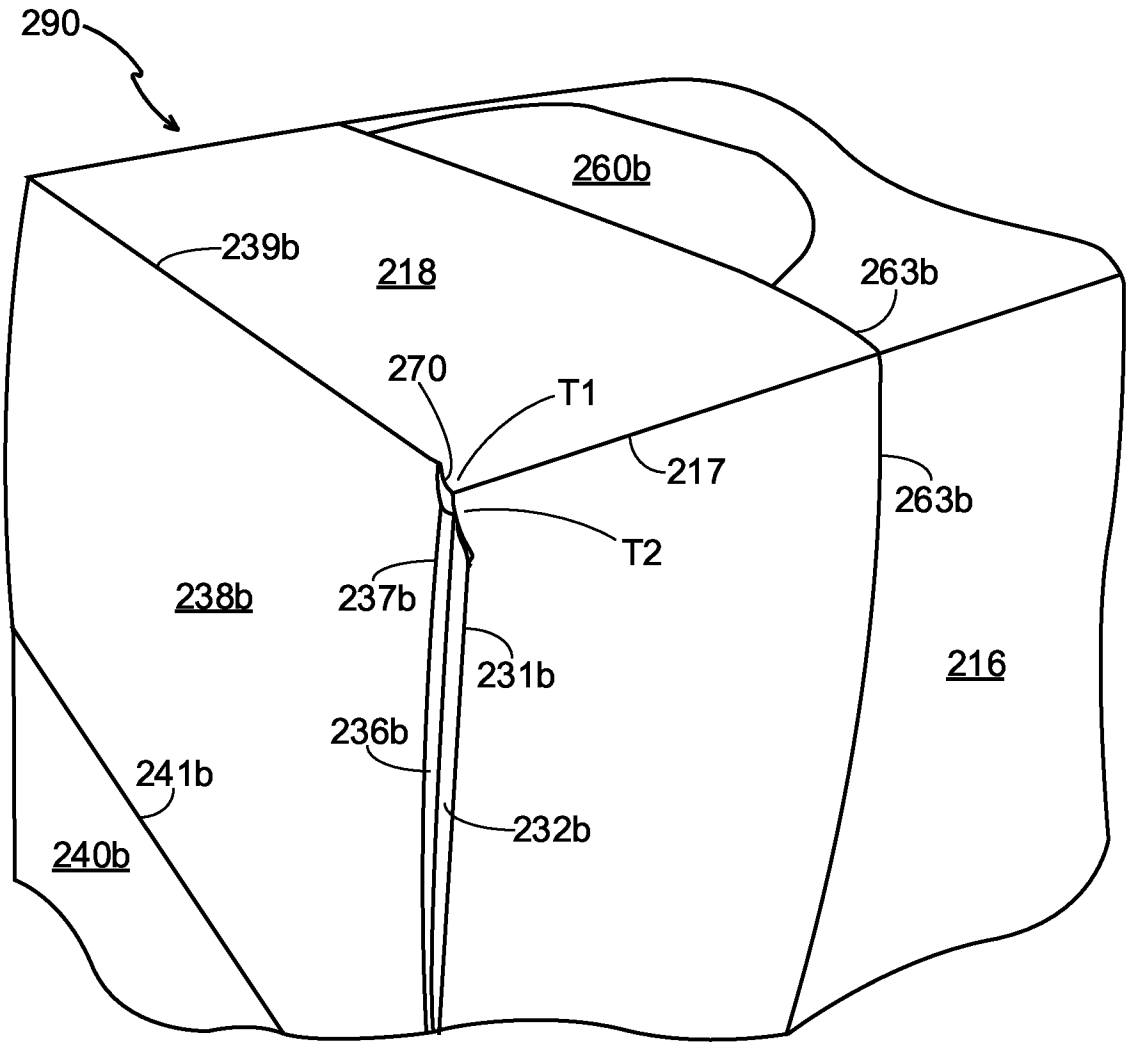

290
260b
239b
218
263b
270
T1
217
263b
T2
238b
237b
231b
216
236b
241b
232b
240b

FIG. 8

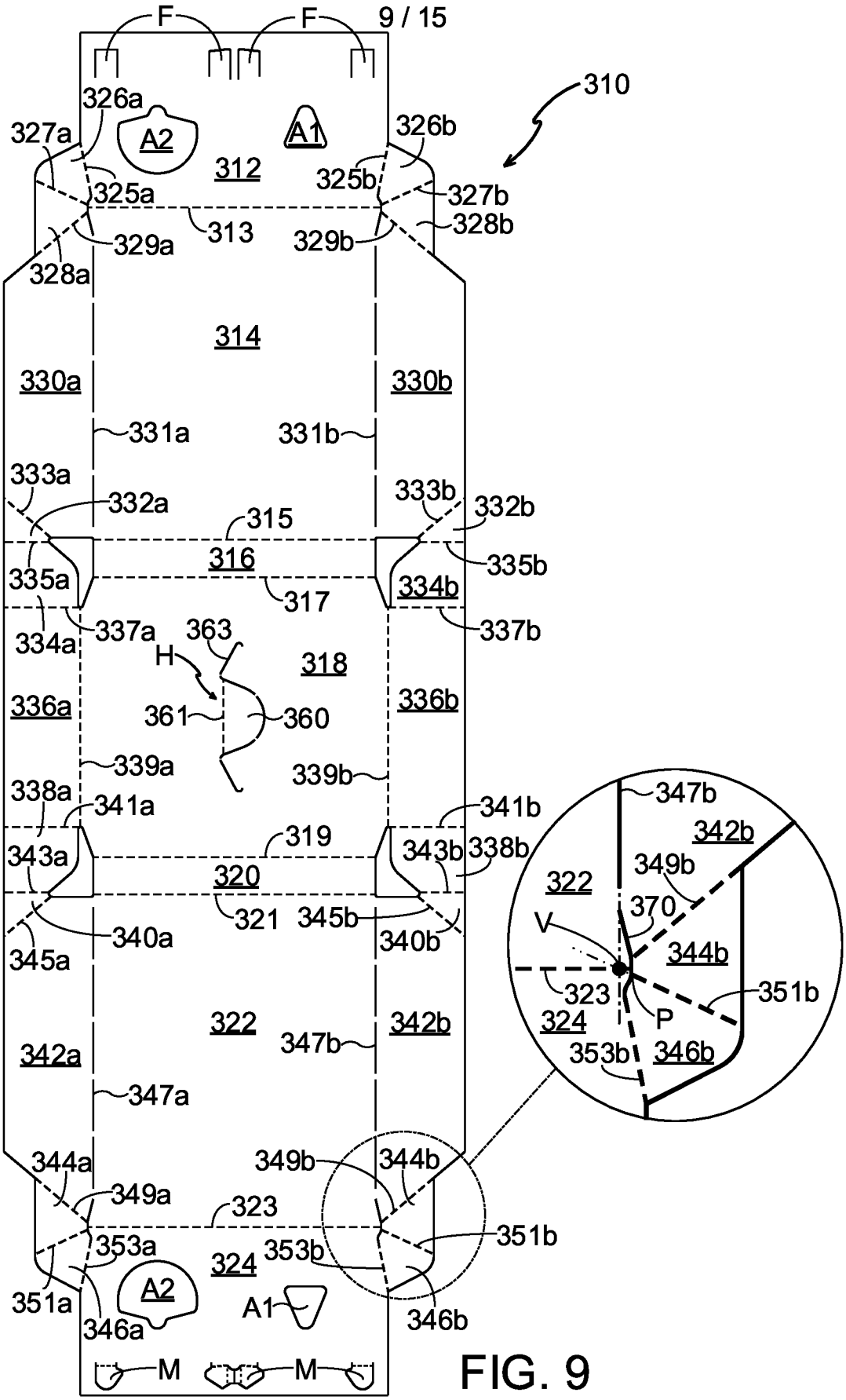

F
F
310
326a
A2
A1
326b
327a
312
325b
325a
327b
313
328b
329a
329b
328a
314
330a
330b
331a
331b
333a
333b
332a
332b
315
316
335b
335a
334b
317
337a
337b
334a
363
H
318
336a
336b
361
360
339a
339b
338a
341a
341b
319
343a
343b
338b
320
321
345b
340a
340b
345a
322
342b
347b
342a
347a
344a
349b
344b
349a
323
351b
353a
353b
324
351a
A2
A1
346a
346b
M
M
347b
342b
349b
322
370
V
344b
323
351b
P
324
353b
346b

FIG. 9

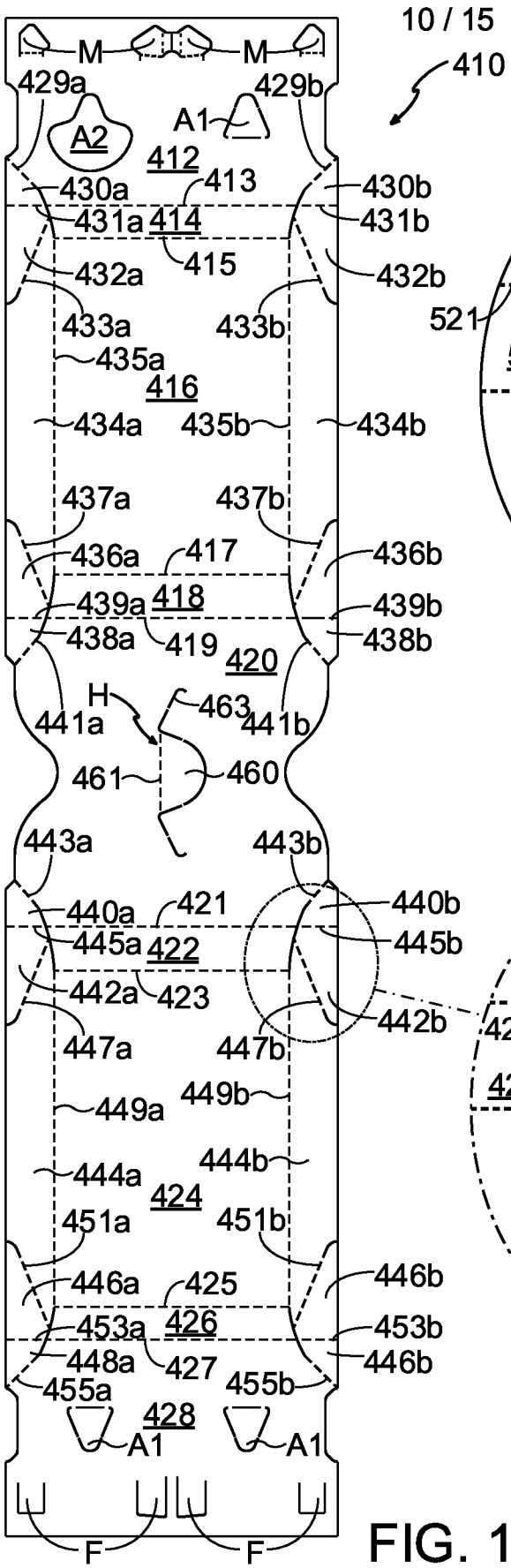


FIG. 10

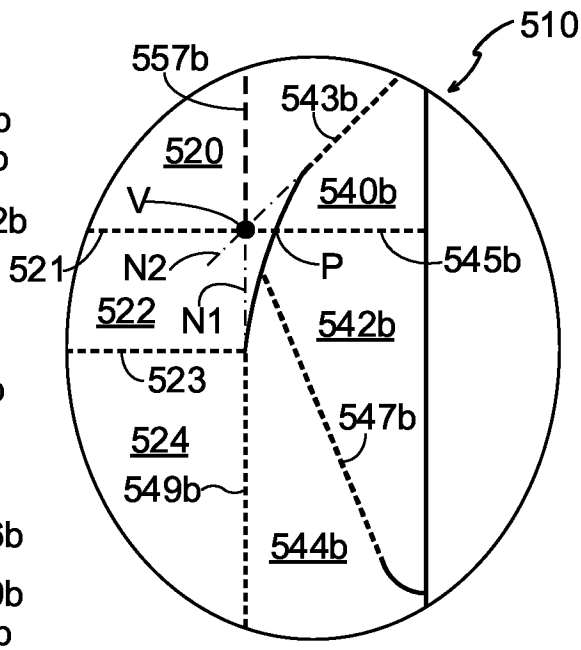


FIG. 10C

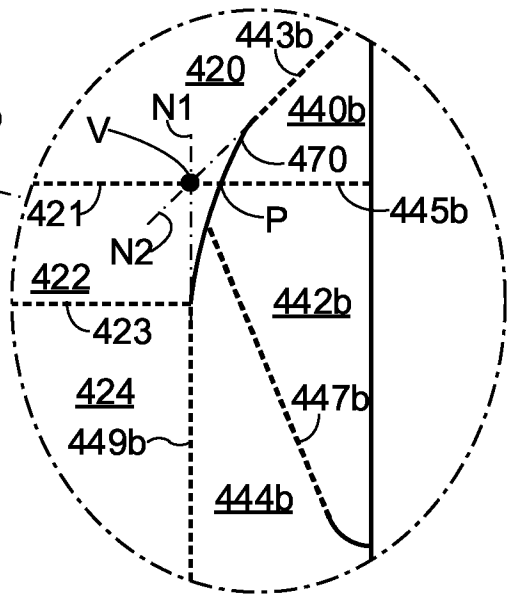


FIG. 10B

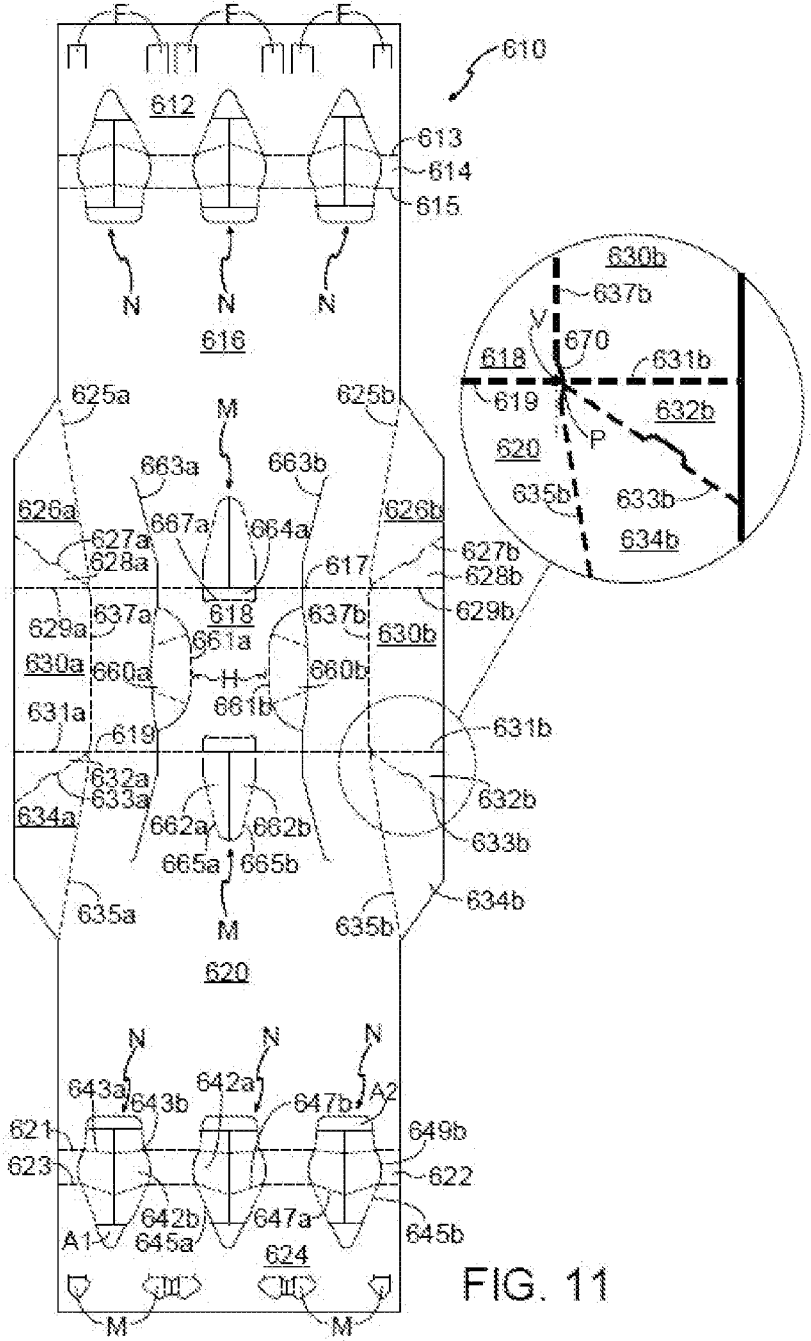

F
F
F
610
612
613
614
615
N
N
N
616
625a
625b
M
663a
663b
626a
626b
627a
628a
667a
664a
617
627b
628b
629b
629a
637a
618
637b
630b
661a
630a
660a
H
660b
631a
661b
619
631b
632a
633a
634a
662a
662b
632b
633b
665a
665b
635a
635b
634b
M
620
N
N
N
643a
643b
642a
647b
A2
621
649b
623
622
642b
647a
645b
A1
645a
624
M
M
630b
637b
Y
670
618
631b
619
632b
P
620
635b
633b
634b

FIG. 11

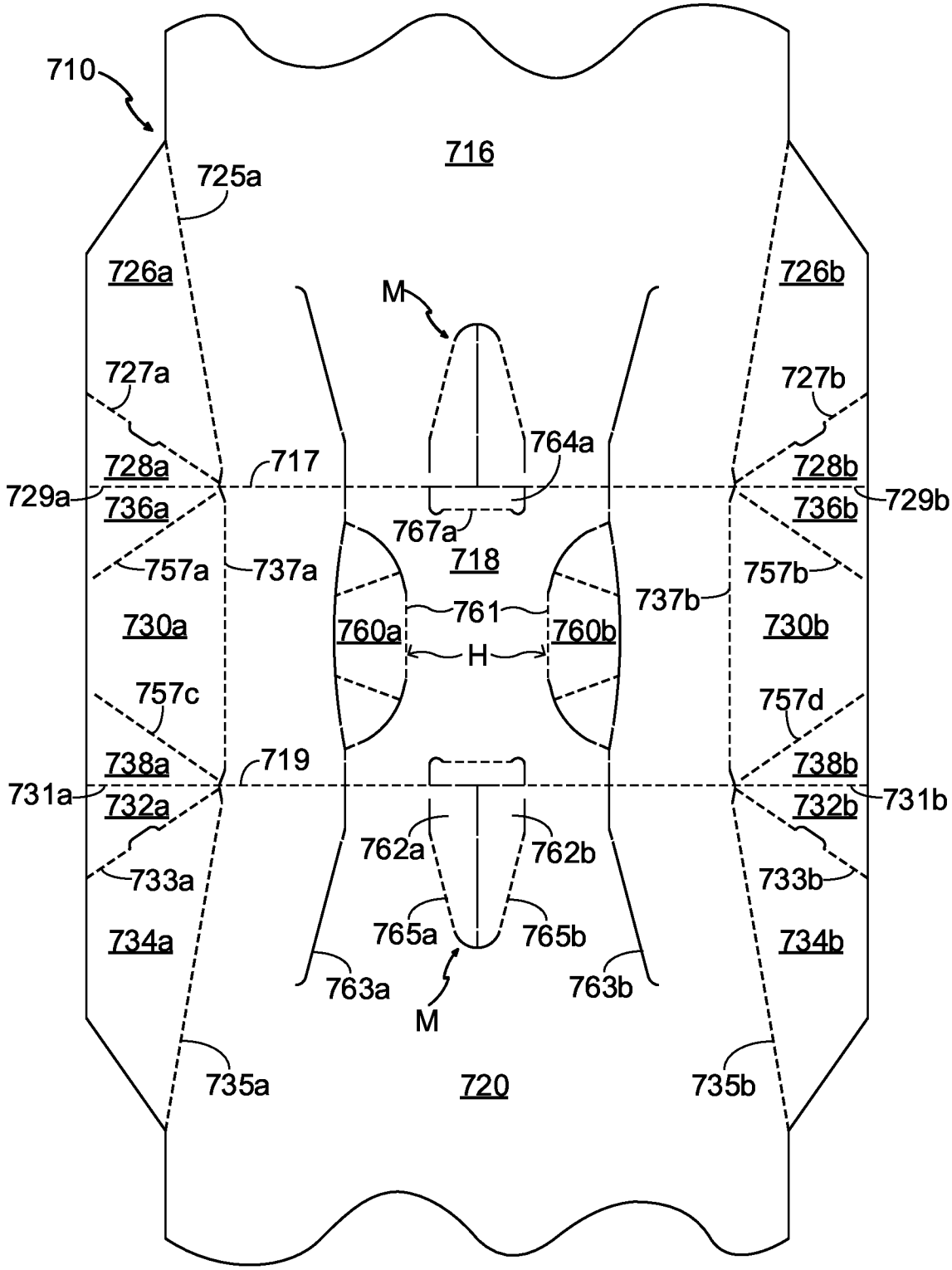

710
716
725a
726a
726b
M
727a
727b
764a
728a
717
728b
729a
736a
736b
729b
767a
718
757a
737a
757b
737b
761
730a
760a
760b
730b
H
757c
757d
738a
719
738b
731a
732a
732b
731b
762a
762b
733a
733b
765a
765b
734a
734b
763a
763b
M
735a
720
735b

FIG. 12

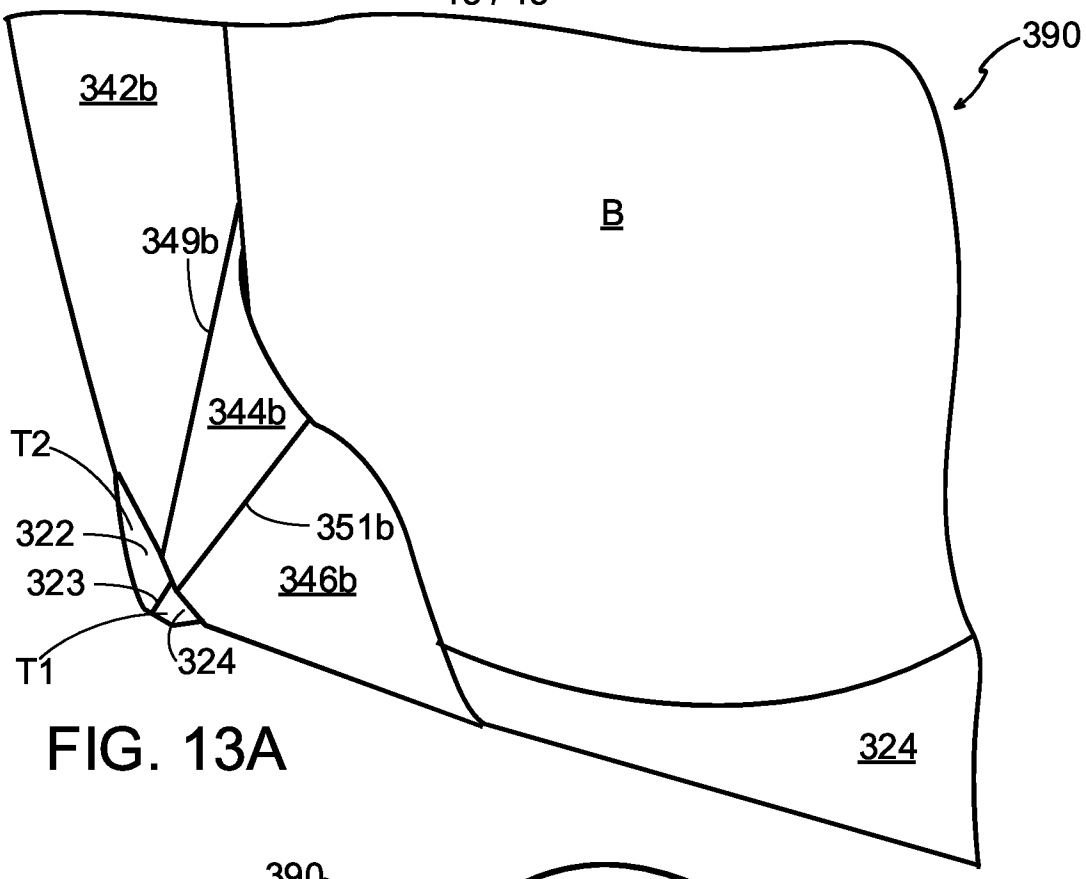


FIG. 13A

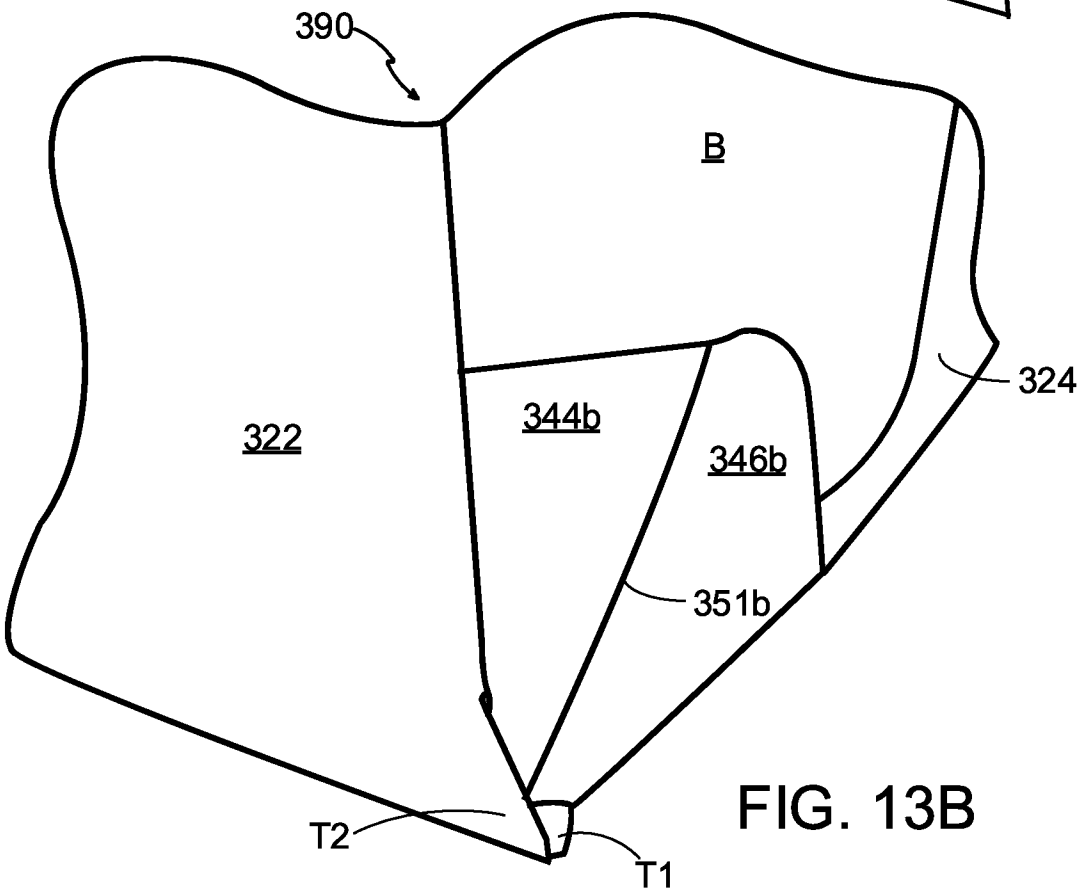


FIG. 13B

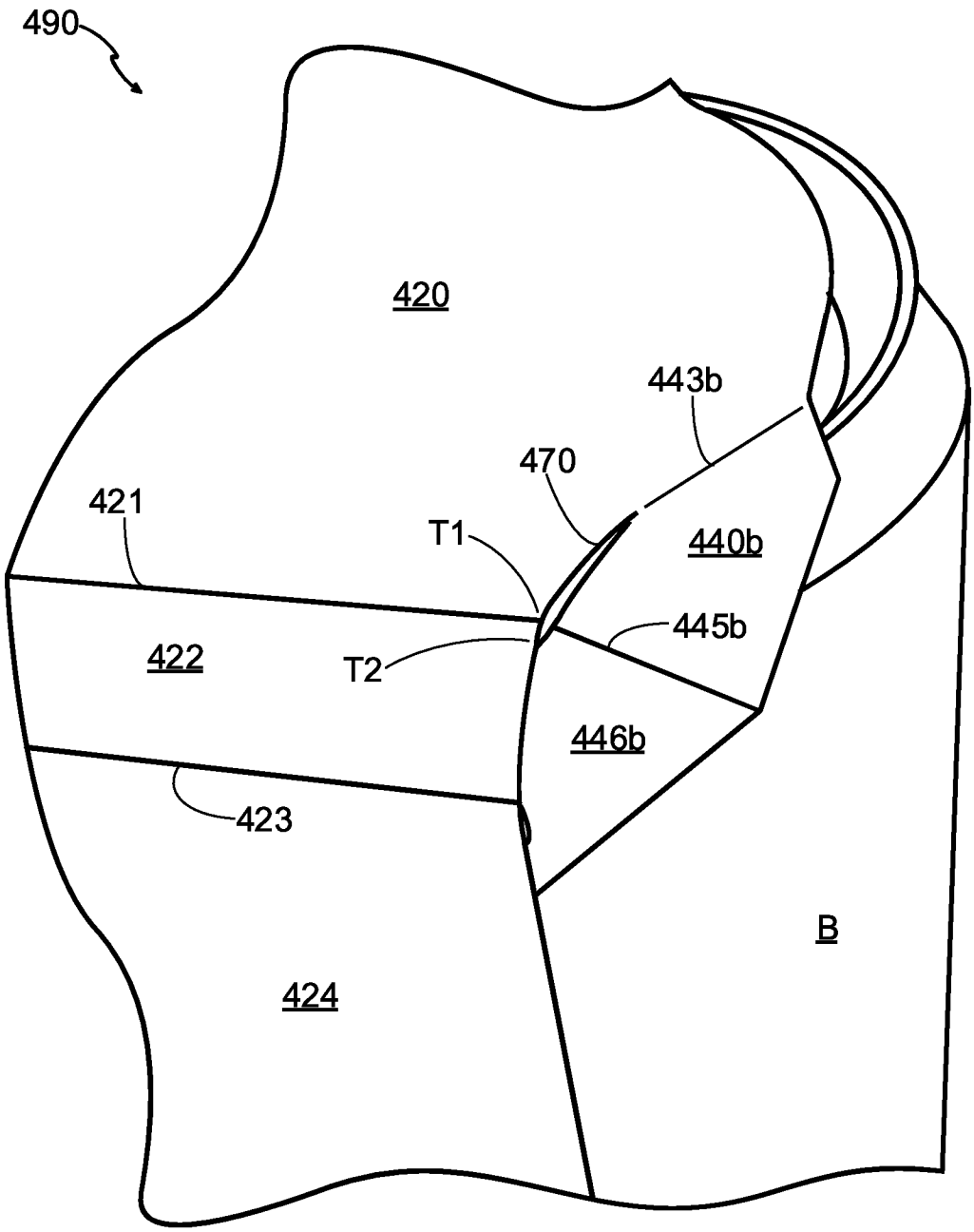


FIG. 14

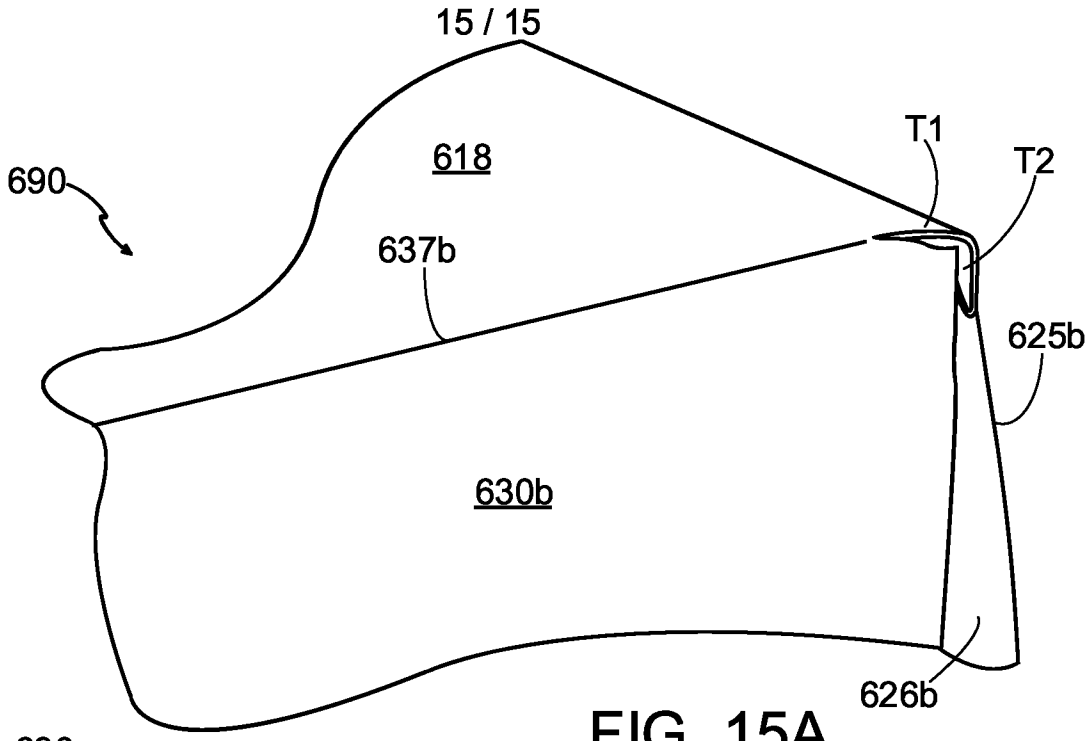


FIG. 15A

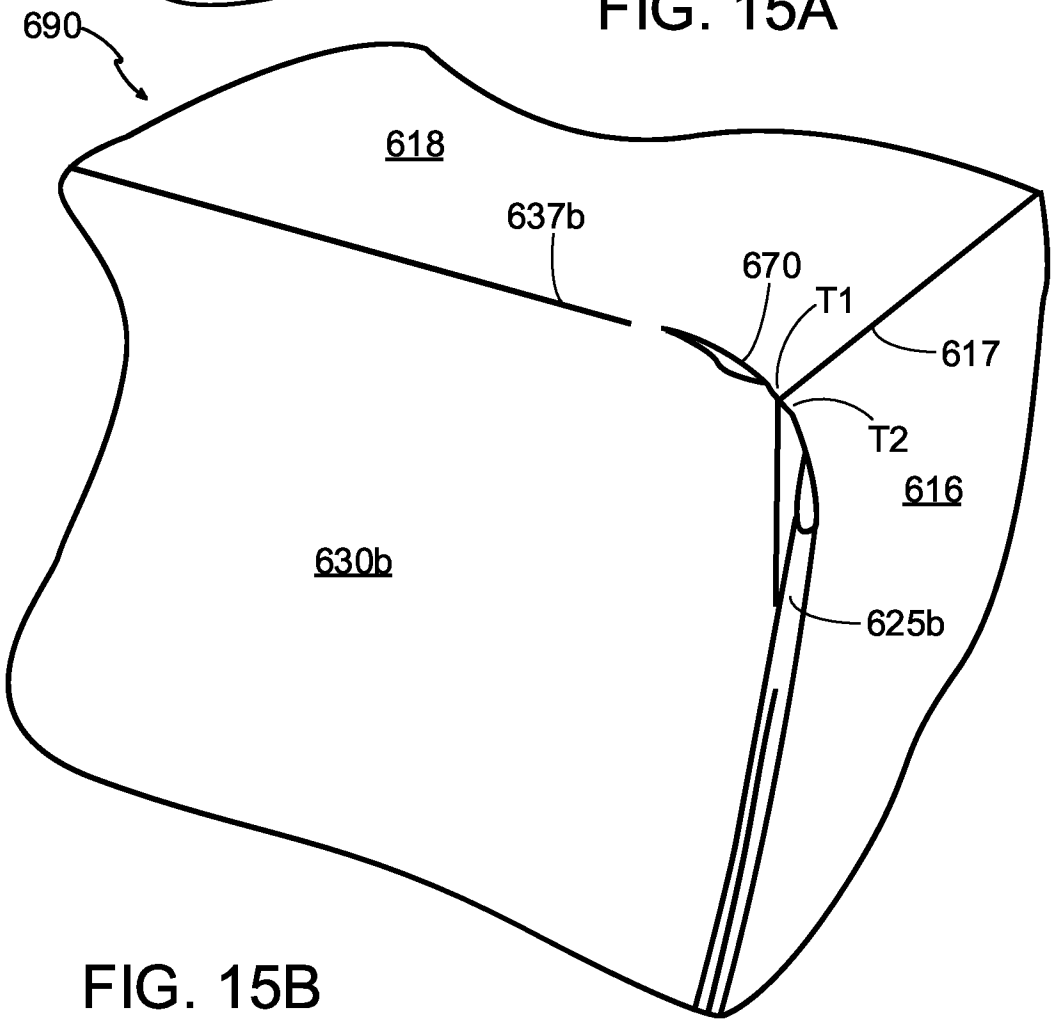


FIG. 15B