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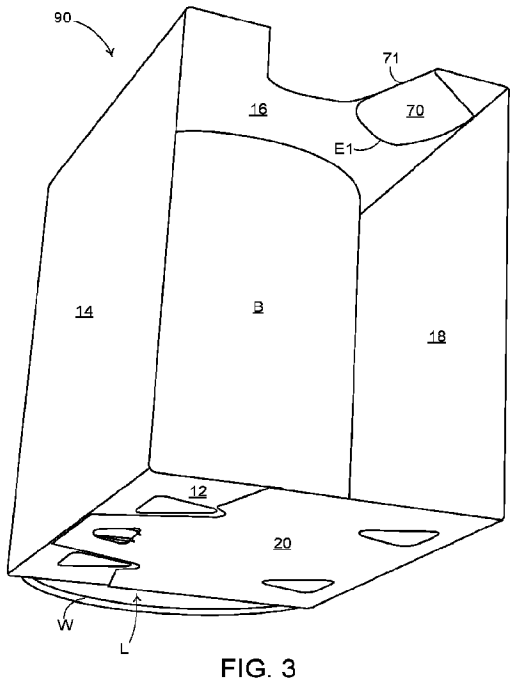


FIG. 3

(57) **Abrégé/Abstract:**
Aspects of the disclosure relate to a package, an article carrier for packaging a plurality of articles and to a blank for forming the article carrier. The article carrier comprises a plurality of panels forming a tubular structure for surrounding at least one article having a recess. The article carrier comprises an article retention device for engaging the recess of one of said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure. The article retention device comprises a flap hingedly connected to one of the plurality of panels.

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Abstract:

Aspects of the disclosure relate to a package, an article carrier for packaging a plurality of articles and to a blank for forming the article carrier. The article carrier comprises a plurality of panels forming a tubular structure for surrounding at least one article having a recess. The article carrier comprises an article retention device for engaging the recess of one of said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure. The article retention device comprises a flap hingedly connected to one of the plurality of panels.

ARTICLE CARRIER AND BLANK THEREFOR

TECHNICAL FIELD

The present invention relates to article carriers and to blanks for forming the same. More specifically, but not exclusively, the invention relates to a wraparound carrier having an article retention structure including an engagement device for securing an upper end of an article.

BACKGROUND

In the field of packaging it is known to provide cartons or article carriers 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 desirable that the articles held within a carton are securely held and protected during transportation.

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

SUMMARY

A first aspect of the invention provides an article carrier for packaging at least one article, each article may comprise having a recess, projection or upstand. The article carrier comprises a plurality of panels forming a tubular structure for surrounding at least one article. The article carrier comprises an article retention device for engaging said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure. The article retention device may engage a recess, projection or

upstand of one of said at least one article. The article retention device comprises a single engaging tab disposed at least in part in a cutaway or recess at an end edge of one of the plurality of panels. The tab is hinged to said one of the plurality of panels along an oblique edge of the cutaway or recess. The oblique edge is spaced apart from an adjacent side edge of said one of the plurality of panels.

Optionally, said one of the plurality of panels is a top panel.

Optionally, the flap is disposed in registry with the at least one article received in the carrier.

Optionally, the cutaway or recess is defined by the oblique edge, an opposed oblique edge and an intermediate edge extending between the oblique edges.

Optionally, the engaging tab comprises a first maximum width, and the cutaway or recess comprises a second maximum width, the first maximum width of the tab is greater than a half of the second maximum width of the cutaway or recess.

Optionally, the tab is disposed entirely within the cutaway or recess.

Optionally, the article retention device is located in a cutaway or recess defined in, or struck from, an end of said one of the plurality of panels and does not increase the footprint of the panel from which it is struck.

Optionally, the tab partially defines a recessed edge of said one of the plurality of panels.

Optionally, the tab is folded inwardly about a hinged connection to said one of the plurality of panels more than ninety degrees so as to be substantially in face-to-face relationship with the panel to which it is hinged.

Optionally, the article carrier is of the wrap-around type, comprising a composite wall formed from two panels secured together.

Optionally, the composite wall is a bottom wall of the tubular structure.

A second aspect of the invention provides an article carrier for packaging at least one article. The article carrier comprises a plurality of panels forming a tubular structure for surrounding at least one article. An article retention device is provided for engaging said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure. The plurality of panels includes a pair of overlapping panels forming a composite wall of the tubular structure. The article retention device comprises an engaging tab hinged to a free edge of one of the pair of overlapping panels along an oblique hinged connection. The free edge may oppose a hinged edge between one of the pair of overlapping panels and another one of the plurality of panels.

Optionally, the oblique hinged connection is angled to prevent the tab from interfering with a machine access opening when the tab is folded thereabout.

Optionally, the oblique hinged connection is a single oblique fold line.

Optionally, the article carrier is of the wrap-around type, comprising a composite wall formed from two panels secured together and composite wall is a bottom wall of the tubular structure.

Optionally, the tab is folded inwardly about a hinged connection to said one of the pair of overlapping panels more than ninety degrees so as to be substantially in face-to-face relationship with the panel to which it is hinged.

A third aspect of the invention provides an article carrier for packaging at least one article. The article carrier comprises a plurality of panels forming a tubular structure for surrounding at least one article and an article retention device for engaging said at least

one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure. The plurality of panels includes a pair of overlapping panels forming a composite wall of the tubular structure. The article retention device comprises an engaging tab hinged to a free edge of one of the pair of overlapping panels and having a recess along a free end edge thereof. The free edge of the tab opposes a hinged edge between the tab and said one of the pair of overlapping panels.

Optionally, the recess is positioned and sized such that it is brought into registration with at least a part of a machine access opening when the tab is held in its folded position.

Optionally, the article carrier is of the wrap-around type, comprising a composite wall formed from two panels secured together and composite wall is a bottom wall of the tubular structure.

Optionally, the tab is folded inwardly about a hinged connection to said one of the pair of overlapping panels more than ninety degrees so as to be substantially in face-to-face relationship with the panel to which it is hinged.

A fourth aspect of the invention provides a package comprising the combination of an article carrier and at least one article having a recess. The article carrier comprises a plurality of panels forming a tubular structure surrounding the at least one article and an article retention device engaging a recess of said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure. The article retention device comprises a single engaging tab disposed in, and defining, at least in part, a cutaway at an end edge of one of the plurality of panels. The tab is hinged, by a hinged connection, to said one of the plurality of panels along an oblique edge of the cutaway. The oblique edge is spaced apart from an adjacent side edge of said one of the plurality of panels. The tab is folded inwardly about the hinged connection more than ninety degrees so as to be substantially in face-to-face relationship with said one of the plurality of panels and in engagement with the recess in the article.

A fifth aspect of the invention provides a package comprising the combination of an article carrier and at least one article having a recess. The article carrier comprises a plurality of panels forming a tubular structure surrounding at least one article and an article retention device engaging said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure. The plurality of panels includes a pair of overlapping panels forming a composite wall of the tubular structure. The article retention device comprises an engaging tab hinged to a free edge of one of the pair of the pair of overlapping panels along an oblique hinged connection. The tab is folded inwardly about the oblique hinged connection more than ninety degrees so as to be substantially in face-to-face relationship with said one of the plurality of panels and in engagement with the recess in the article.

A sixth aspect of the invention provides a package comprising the combination of an article carrier and at least one article having a recess. The article carrier comprises a plurality of panels forming a tubular structure surrounding at least one article and an article retention device engaging said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure. The plurality of panels includes a pair of overlapping panels forming a composite wall of the tubular structure. The article retention device comprises an engaging tab hinged, by a hinged connection, to a free edge of one of the pair of overlapping panels. The engaging tab has a recess along its free end edge. The tab is folded inwardly about the hinged connection more than ninety degrees so as to be substantially in face-to-face relationship with said one of the plurality of panels and in engagement with the recess in the article.

A seventh aspect of the invention provides a blank for forming an article carrier. The blank comprises a plurality of panels for forming a tubular structure for surrounding at least one article and an article retention device for engaging said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure in a setup article carrier. The article retention device comprises a single engaging tab disposed at least in part in a recess at an end edge of one of the plurality of panels. The tab is hinged to said one of the plurality of panels along an oblique edge of the recess.

The oblique edge is spaced apart from an adjacent side edge of said one of the plurality of panels.

An eighth aspect of the invention provides a blank for forming an article carrier. The blank comprises a plurality of panels forming a tubular structure for surrounding at least one article and an article retention device for engaging the at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure in a setup article carrier. The article retention device comprises an engaging tab hinged to a free edge of one of the pair of overlapping panels along an oblique hinged connection.

A ninth aspect of the invention provides a blank for forming an article carrier. The blank comprises a plurality of panels forming a tubular structure for surrounding at least one article and an article retention device for engaging the at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure in a setup article carrier. The article retention device comprises an engaging tab hinged to a free edge of one of the pair of overlapping panels and having a recess along its free end edge.

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 an article carrier according to a first embodiment;

Figure 1B is a plan view from above of the blank of Figure 1 showing the position of articles relative to top and bottom panels thereof;

Figure 2 is a perspective view of an article carrier formed from the blank of Figure 1;

Figures 3 and 4 are perspective views of the article carrier of Figure 2 in which an article has been removed or omitted for illustrative purposes;

Figure 5 is a bottom view of the carton of Figure 2 in which the positions of internal features are shown by phantom lines;

Figure 6 is a plan view from above of a blank for forming an article carrier according to a second embodiment;

Figure 7 is a perspective view from below of an article carrier formed from the blank of Figure 6; and

Figure 8 is a bottom view of the carton of Figure 7 in which the positions of internal features are shown by phantom lines.

DETAILED DESCRIPTION OF EMBODIMENTS

Detailed descriptions of specific embodiments of the package, blanks and article carriers are disclosed herein. It will be understood that the disclosed embodiments are merely examples of the way in which certain aspects of the invention can be implemented and do not represent an exhaustive list of all of the ways the invention may be embodied. As used herein, the word "exemplary" is used expansively to refer to embodiments that serve as illustrations, specimens, models, or patterns. Indeed, it will be understood that the packages, blanks and article carriers described herein may be embodied in various and

alternative forms. The Figures are not necessarily to scale and some features may be exaggerated or minimised to show details of particular components. Well-known components, materials or methods are not necessarily described in great detail in order to avoid obscuring the present disclosure. Any specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the invention.

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, beverage or food cans, hereinafter referred to as articles B, as shown in Figure 2. The blank 10 can be assembled to form a secondary package for packaging at least one primary product container or package. An alternative blank 110 is shown in Figure 6 for forming a carton or carrier 190, as shown in Figure 7, 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 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. Other exemplary containers include bottles (for example metallic, glass or plastics bottles), cans (for example aluminium cans), tins, cups, pots, pouches, packets and the like.

The blanks 10; 110 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 90; 190 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 illustrated embodiments, the blanks 10; 110 are configured to form a carton or carrier 90; 190 for packaging an exemplary arrangement of exemplary articles B. In the embodiment illustrated in Figure 1 the arrangement is an m x n matrix or array, having two rows (m=1) and two columns (n=2); one row of two articles B is provided, and the articles B are 200g steel cans. In the embodiment illustrated in Figure 6 the arrangement is an m x n matrix or array, having two rows (m=1) and three columns (n=3); one row of three articles B is provided, and the articles B are 200g steel cans. Alternatively, the blanks 10; 110 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 for example, but not limited to, fully enclosed cartons or basket carriers, the articles B may be bottles or cans.

Turning to Figure 1, there is illustrated a blank 10 for forming an article carrier 90 of the wrap-around type (see Figure 2) according to an embodiment of the disclosure. The blank 10 comprises a plurality of main panels 12, 14, 16, 18, 20 for forming a tubular structure. The plurality of main panels 12, 14, 16, 18, 20 comprises: a first base panel 12, a first side panel 14, a top panel 16, a second side panel 18, and a second base panel 20. The

plurality of panels 12, 14, 16, 18, 20 may be arranged in a linear series hinged one to the next by corresponding fold lines 13, 15, 17, 19.

The blank 10 is foldable to form a package 90 as illustrated in Figures 2, 3 and 4. The first and second base panels 12, 20 are engageable with one another in an overlapping relationship to form a composite base wall 12/20 of the carton 90. The blank 10 may comprise a complementary locking mechanism for securing the second base panel 20 to the first base panel 12. The first base panel 12 may comprise at least one first part F of the complementary locking mechanism. The second base panel 20 may comprise at least one second part M of the complementary locking mechanism. In the illustrated embodiment, the first base panel 12 comprises a female tab F defining an opening in the first base panel 20. The second base panel 20 comprises a male tab M; and the opening in the first base panel 12 is configured to receive the male tab M. The female tab F is arranged to be displaced out of the first base panel 12 to form the opening and to bear against the male tab M when received therein. In some embodiments, the complementary locking mechanism M/F may be omitted; and the first and second base panels 12, 20 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, 20 may comprise at least one first aperture A1 (also referred to herein as a machine access opening). In the illustrated embodiment, each of the first and second base panels 12, 20 comprises two first apertures A1. The first apertures A1 may be employed to facilitate construction of the carton 90. A packaging machine component may engage with the first apertures A1 to enable the plurality of panels 12, 14, 16, 18, 20 to be tightened about a group of articles B. The first apertures A1 may also be employed to facilitate alignment of the first and second base panels 12, 20 with respect to each other or to align the first part F of the complementary locking mechanism with the second part M of the complementary locking mechanism.

The complementary locking mechanism illustrated and described is entirely optional.

The blank 10 comprises at least one first article retention device or upper article engagement structure for engaging an upper end of the articles B. The blank 10 illustrated in Figure 1 comprises two upper article engagement structures. The first article retention devices secure an endmost article B within the tubular structure formed by the plurality of main panels 12, 14, 16, 18, 20.

Each of the upper article engagement structures comprise a tab or flap 70 hingedly connected to the top panel 16. A first upper article engagement structure comprises a flap 70 hingedly connected to the top panel 16. The first upper article engagement structure is disposed proximate to a first end of the top panel 16. A second upper article engagement structure comprises a flap 70 hingedly connected to the top panel 16. The second upper article engagement structure is disposed proximate to a second end of the top panel 16.

The flap 70 of the first upper article engagement structure is struck from a first marginal end region of the top panel 16. A free edge portion of the flap 70 may be colinear with a first outer edge of the blank 10.

The flap 70 of the second upper article engagement structure is struck from a second marginal end region of the top panel 16. A free edge portion of the flap 70 may be colinear with a second outer edge of the blank 10.

The flaps 70 of the upper article engagement structures do not extend beyond the footprint of the top panel 16. The flaps 70 of the upper article engagement structures are contained entirely within the footprint of the top panel 16.

A cutaway or recess C is provided in the first end of the top panel 16, the flap 70 of the first upper article engagement structure comprises an engaging edge E1 defined by the cutaway C. The flap 70 of the first upper article engagement structure may be considered to define a part of the cutaway C and when folded out of the plane of the top panel 16 increase the size of the cutaway C.

The cutaway C is defined only in the top panel 16 and does not extend into the first and second side panel 14, 18.

The flap 70 of the first upper article engagement structure is hingedly connected to the top panel 16 by a hinged connection in the form of a fold line 71 which is obliquely oriented with respect to the fold line 17 hinging the top panel 16 to the second side panel 18.

A cutaway or recess C is provided in the second end of the top panel 16, the flap 70 of the second upper article engagement structure comprises an engaging edge E1 defined by the cutaway C. The flap 70 of the second upper article engagement structure can be considered to define a part the cutaway C and when folded out of the plane of the top panel 16 increase the size of the cutaway C. The cutaway C is defined only in the top panel 16 and does not extend into the first and second side panel 14, 18.

The flap 70 of the second upper article engagement structure is hingedly connected to the top panel 16 by a hinged connection in the form of a fold line 71 which is obliquely oriented with respect to the fold line 17 hinging the top panel 16 to the second side panel 18.

The hinged connection between flap 70 of the second upper article engagement structure and the top panel 16 is divergently oriented with respect to the hinged connection between flap 70 of the first upper article engagement structure and the top panel 16.

A cut extends from a first or inner end of each of the fold lines 71 to the respective cutaway C.

The blank 10 comprises at least one second article retention device or lower article engagement structure for engaging a lower or opposing end of the articles B. The blank 10 illustrated in Figure 1 comprises two lower article engagement structures. The first

article retention devices secure an endmost article B within the tubular structure formed by the plurality of main panels 12, 14, 16, 18, 20.

Each of the lower article engagement structures comprise a tab or flap 60 hingedly connected to the first base panel 12. The first base panel 12 is disposed internally of the second base panel 20 in a setup carrier 90. A first lower article engagement structure comprises a flap 60 hingedly connected to the first base panel 12. A second lower article engagement structure comprises a flap 60 hingedly connected to the first base panel 12. The first and second lower article engagement structures are disposed on opposing side of notional medial line bisecting the first base panel 12 in a transverse direction.

The flaps 60 of the first and second lower article engagement structures are hingedly connected to a side edge (also referred to herein as a free edge) of the first base panel 12 by a hinged connection in the form of a fold line 61. The side edge of the first base panel 12 opposes a hinged edge defined by the hinged connection between the first base panel 12 and the first side panel 14. The fold line 61 hinging the flap 60 of the first lower article engagement structure to the first base panel 12 is non-linearly oriented with respect to the fold line 61 hinging the flap 60 of the second lower article engagement structure to the first base panel 12.

The fold line 61 hinging the flap 60 of the first lower article engagement structure to the first base panel 12 and the fold line 61 hinging the flap 60 of the second lower article engagement structure to the first base panel 12 are arranged to converge towards the notional medial line bisecting the first base panel 12 in a transverse direction.

The fold line 61 hinging the flap 60 of the first lower article engagement structure to the first base panel 12 may be obliquely oriented with respect to the fold line 61 hinging the flap 60 of the second lower article engagement structure to the first base panel 12.

The fold line 61 hinging the flap 60 of the first lower article engagement structure to the first base panel 12 and the fold line 61 hinging the flap 60 of the second lower article

engagement structure to the first base panel 12 are each arranged to be obliquely oriented with respect to the fold line 13 hinging the first base panel 12 to the first side panel 14.

The second base panel 20 is dimensioned such that at least a portion -a medial portion in the illustrated embodiment- extends between the first and second side panels 14, 18. The illustrated embodiment comprises a medial tongue portion from which the second part M of the complementary locking mechanism is struck or defined within. Opposing edges of the tongue portion are defined by a respective recess R. The recesses R are configured and arranged such the second base panel 20 does not obstruct the first apertures A1 in the first base panel 12.

The flaps 60 of the first and second lower article engagement structures are arranged such that in a folded condition the flaps 60 do not obstruct the first apertures A1 in the first base panel 12, the folded position is indicated in Figure 1B by phantom (dot/dash) lines 60'.

The folded position of the flaps 70 of the first and second upper article engagement structures are indicated in Figure 1B by phantom -dot/dash- lines 70'. The position of the articles B is shown relative to the top panel 16 as indicated in Figure 1B by phantom (dot/dash) lines B'. The engaging edges E1 are arranged to be engageable with an inner surface of an upstanding wall or other suitable portion of the article B. The upper and lower ends of the articles B comprise a recess, rim, annular ridge or other feature with which the tabs 60, 70 are engageable.

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 two articles B are arranged in a 1 x 2 array. The top panel 16 of the blank 10 is disposed above the group of articles B to provide a top wall 16 of the carton 90.

The flaps 70 of the upper article engagement structures are folded into face-to-face relationship with the top panel 16.

The flaps 70 may be folded by a part of a packaging machine such as but not limited to a passive device such as a static guide or an active device such as a folding wheel or by a combination of active and passive devices.

In one example, the blank 10 is oriented transversely with respect to a conveyor, such that the flap 70 of the first upper article engagement structure leads (is downstream of) the flap 70 of the second upper article engagement structure.

The leading flap 70 may be folded by a static guide which retards movement of the flap 70 with respect to the blank 10 to effect folding of the flap 70.

The trailing (upstream) flap 70 may be folded by an active device which accelerates movement of the flap 70 with respect to the blank 10 to effect folding of the flap 70.

Once the flaps 70 of the article engagement structures are folded into face-to-face relationship with the top panel 16, the blank 10 is moved relative to the group of articles B so as to be disposed over upper ends of the articles B.

The flaps 70 may be received in a recess or void in the upper end T of the articles B.

The flaps 70 may be arranged to abut a portion of the articles B providing an abutment face W or be located in close proximity to the abutment face W so as to inhibit movement of the articles B with respect to the article carrier 90.

The first and second side panels 14, 18 are folded, with respect to the top panel 16, about fold lines 15, 17 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 first and second side panels 14, 18 form first and second side walls 14, 18 of the carton 90 respectively.

The flaps 60 of the lower article engagement structures are folded with respect to the first base panel 12 about their respective fold line 61 to be brought into face-to-face relationship with an inner surface of the first base panel 12.

The first base panel 12 is folded about the fold line 13 so as to be disposed adjacent to the base L of the group of articles B.

The flaps 60 may be received in a recess or void in the lower end L of the articles B, see Figures 3 and 5.

The flaps 60 may be arranged to abut a portion of the articles B providing an abutment face W or be located in close proximity to the abutment face W so as to inhibit movement of the articles B with respect to the article carrier 90.

The second base panel 20 is then folded about the fold line 19 so as to be in at least partial overlapping relationship with the first base panel 12.

The first and second base panels 12, 20 are secured together. The male tab M is displaced inwardly out of the plane of the second base panel 20. In so doing, the female tab F is displaced inwardly creating a corresponding opening in the first base panel 12. The male tab M is received in the opening so as to lock the first and second base panels 12, 20 together. In this way a tubular structure is formed about the group of articles B.

The assembled carton 90 is shown in Figures 2, 3 and 4.

The flaps 70 engage a rim, chime or upstanding wall W or other projection of the article B. When the articles B are cans the top wall T of the can may be countersunk, disposed below the upper end of the side wall or end seam of the article B. The top wall T of the can is connected to the side walls by a can chime or end seam.

The flaps 70 engage an internal surface or abutment face of the rim W. The flaps 70 may be disposed in the recess or void provided by a countersunk top wall T of the article B, as illustrated in Figure 4.

The flaps 70 remain in engagement with the articles B when the carrier 90 is transported, the flaps 70 may unfold, due to the inherent resilience or elasticity of the carrier substrate, upon upward displacement of the top panel 16 with respect to the group of articles B.

The flaps 60 engage a rim, chime or upstanding wall W or other projection of the article B. When the articles B are cans the base wall L of the can may be countersunk, disposed above the lower end of the side wall or end seam of the article B. The base wall L of the can is connected to the side walls by a can chime or end seam.

The flaps 60 engage an internal surface or abutment face of the rim W. The flaps 60 may be disposed in the recess or void provided by a countersunk lower wall L of the article B, as illustrated in Figures 3 and 5.

The flaps 60 remain in engagement with the articles B when the carrier 90 is transported, the flaps 60 may unfold, due to the inherent resilience or elasticity of the carrier substrate, upon upward displacement of the composite base panel 12/20 with respect to the group of articles B.

Figure 5 shows the position of the flaps 60 relative to the walls of the articles B, the first apertures A1, and the recesses R. The tabs 60 are configured to allow movement of the first apertures A1 in the first base panel 12 relative to the recesses R in the side edge of the second base panel 20. This allows the first base panel 12 to be moved relative to the

second base panel 20 to align them with respect to each other and allow the first and second parts F, M of the locking mechanism to be aligned with respect to each other.

The locking mechanism F/M is disposed between the first apertures A1 of the first base panel 12 and the recesses R of the second base panel 20.

The locking mechanism F/M is arranged to be disposed in vertical registry with a void in the carrier 90; the void being located between the side walls of the articles B and the first side panel 14 of the carrier 90.

The flaps 60 of the lower article engagement structures are disposed substantially or generally between the first apertures A1 of the first base panel 12 and the recesses R of the second base panel 20.

The locking mechanism F/M is disposed between substantially or generally between a flap 60 of a first one of the lower article engagement structures and a flap 60 of a second one of the lower article engagement structures.

The flaps 70 of the upper article engagement structures and the flaps 60 of the lower article engagement structures may encourage the pair of articles B towards each other and may bring the pair of articles B in to touching contact or close proximity so as to prevent or inhibit impacts with each other.

Referring now to Figures 6 and 7, there is shown an additional 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. The additional embodiment shares many common features with the first embodiment and therefore only the differences from the embodiment illustrated in Figures 1 to 5 will be described in detail

Figure 6 illustrates a blank 110 comprising a plurality of main panels 112, 114, 116, 118, 120 for forming a tubular structure. The plurality of main panels 112, 114, 116, 118, 120 comprises: a first base panel 112, a first side panel 114, a top panel 116, a second side panel 118, and a second base panel 120. The plurality of panels 112, 114, 116, 118, 120 may be arranged in a linear series hinged one to the next by corresponding fold lines 113, 115, 117, 119.

The blank 110 is foldable to form a package 190 as illustrated in Figures 2, 3 and 4. The first and second base panels 112, 120 are engageable with one another in an overlapping relationship to form a composite base wall 112/120 of the carton 190.

The blank 110 is configured to accommodate three articles B arranged in a linear row.

The first base panel 112 comprises a pair of female tabs F. The second base panel 120 comprises a pair of male tabs M. The second base panel 120 comprises a pair of tongue portions each defined, at least in part, by a pair of recesses R. A male tab M is struck from or defined in each of the tongue portions.

The first and second base panels 112, 120 each comprise three handling apertures A1 for alignment of the first base panel 112 with respect to the second base panel 120.

The top panel 116 comprises an upper article engagement structure at each end thereof. In the illustrated embodiment, each upper article engagement structure comprises a flap 170. The flap 170 comprises a free edge a portion of which provides an engaging edge E1. The engaging edge E1 may be arcuate or curvilinear. The free edge of the flap 170 may comprises a linear portion. The linear portion may be substantially parallel with a side edge of the blank 110 and may be offset (inset) with respect to said side edge of the blank 110. Insetting the edge of the flap 170 may provide a gap or space between the flap 170 and the second side panel 118 in a setup carrier 190 to accommodate a portion of an article B therebetween. The flaps 170 are hingedly connected to the top panel 116 by a hinged connection in the form of a fold line 171.

Fold lines 171 may be obliquely oriented with respect to the hinged connection between the top panel 116 and the second side panel 118.

Each fold line 171 defines an angle with respect to the fold line 117, the angle may be about 45°, (in the embodiment of Figure 1 each fold line 71 defined and angle of about 20° with respect to the fold line 17). In other embodiments, other angles in the range 0° to 90° may be employed, the angles may be greater than 0° and less than 90°.

Fold lines 171 may be divergently oriented with respect to the hinged connection between the top panel 116 and the second side panel 118.

Fold lines 171 may be divergently oriented with respect to each other.

The first base panel 112 comprises a pair of first lower article engagement structures substantially similar in construction to the lower article engagement structures of the previous embodiment, albeit spaced apart from each other by a greater distance.

The first base panel 112 comprises a second lower article engagement structure. The second lower article engagement structure comprises a flap 162 hingedly connected to a side edge of the first base panel 112, said side edge opposed the hinged edge defined by the fold line 113.

The flap 162 is disposed generally between the flaps 160 of the pair of first lower article engagement structures.

The flap 162 comprises a pair of second engaging edges E3, each second engaging edge E3 opposes a first engaging edge E2 of one of the flaps 160 of a respective one of the first lower article engagement structures.

The flap 162 is hingedly connected to the side edge of the first base panel 112 by a hinged connection in the form of a second fold line 163.

The second fold line 163 may be substantially parallel to the fold line 113 between the first base panel 112 and the first side panel 114.

The flap 162 may comprise a second recess R1 struck from a free edge opposing a hinged edge defined by the second fold line 163.

Optionally, the second base panel 120 comprises at least one second aperture A2, the illustrated embodiment comprises two second apertures A2.

The second apertures A2 are shaped so as to avoid exposure of the first base panel 112, particularly the flaps 160 therethrough. The second apertures A2 are shaped so as to partially surround a respective first or handling aperture A1. The second apertures A2 are spaced apart from said handling aperture A1 so as to prevent or inhibit tear propagation between the second apertures A2 and an adjacent handling aperture A1.

The present disclosure provides an article carrier 90; 190 for packaging at least one article B. The article carrier 90; 190 comprises a plurality of panels 12, 14, 16, 18, 20; 112, 114, 116, 118, 120 forming a tubular structure for surrounding at least one article B and an article retention device for engaging said at least one article B to prevent or inhibit dislodgement or unintentional egress of the article B from at least one of opposite open ends of the tubular structure. The article retention device comprises a single flap or tab 60, 70; 160, 170 hingedly connected to one of the plurality of panels 12, 14, 16, 18, 20; 112, 114, 116, 118, 120 said one of the plurality of panels 12, 14, 16, 18, 20; 112, 114, 116, 118, 120 may be a top panel 16; 116. The flap 60, 70; 160, 170 is disposed in registry with the at least one article B.

The engaging tab 70; 170 is disposed at least in part in a recess C at an end edge of a carton panel 16; 116. The tab 60, 70; 160, 170 is hinged along an oblique edge P1 of the

panel 12, 16; 112, 116 to which it is hinged. The tab 70; 170 is hinged along an oblique edge P1 of the recess C. The oblique edge P1 is spaced apart from the adjacent side edge 17; 117 of the carton panel 16; 116.

The recess C may be defined by the oblique edge P1, an opposed oblique edge P2 and an intermediate edge P3 extending between the oblique edges P1, P2.

The engaging tab 70; 170 comprises a maximum width W2. The recess C comprises a maximum width W1. The maximum width W2 of the tab 70; 170 may be greater than a half of the maximum width W1 of the recess C.

The tab 70; 170 may be disposed entirely within the recess C.

The present disclosure also provides an article carrier 90; 190 for packaging at least one article B. The article carrier 90; 190 comprises a plurality of panels 12, 14, 16, 18, 20; 112, 114, 116, 118, 120 forming a tubular structure for surrounding at least one article B and an article retention device for engaging said at least one article B to prevent or inhibit dislodgement or unintentional egress of the article B from at least one of opposite open ends of the tubular structure. The plurality of panels 12, 14, 16, 18, 20; 112, 114, 116, 118, 120 includes a pair of overlapping panels 12, 20; 112, 120 forming a composite wall 12/20; 112/120 of the tubular structure. The article retention device comprises an engaging tab 60; 160 hinged to the free edge of one of the pair of overlapping panels 12, 20; 112, 120 along an oblique hinged connection 61; 161 in the form of a fold line.

The oblique fold line 61; 161 may be angled to prevent the tab 60; 160 from interfering with a machine access opening A1 when the tab 60; 160 is folded about the oblique fold line 61; 161.;

The hinged connection 61; 161 may be a single oblique fold line.

The present disclosure also provides an article carrier 90; 190 for packaging at least one article B. The article carrier 90; 190 comprises a plurality of panels 12, 14, 16, 18, 20; 112, 114, 116, 118, 120 forming a tubular structure for surrounding at least one article B and an article retention device for engaging said at least one article B to prevent or inhibit dislodgement or unintentional egress of the article B from at least one of opposite open ends of the tubular structure. The plurality of panels 12, 14, 16, 18, 20; 112, 114, 116, 118, 120 includes a pair of overlapping panels 12, 20; 112, 120 forming a composite wall 12/20; 112/120 of the tubular structure. The article retention device comprises an engaging tab 162 hinged to the free edge of one of the pair of overlapping panels 12, 20; 112, 120 and having a recess R1 along its free end edge.

The recess R1 may be positioned and sized such that it is brought into registration with at least a part of a machine access opening A1 when the tab 162 is in its folded position.

The article retention device may be located in a recess C defined in, or struck from, an end of one of the plurality of panels 12, 14, 16, 18, 20; 112, 114, 116, 118, 120. In this way, the retention device does not increase the footprint of the top panel 16; 116 or blank 10; 110.

The top panel 16; 116 comprises at least one recessed edge to which article retention device is hingedly connected.

In some embodiments the flap 70; 170 partially defines the at least one recessed edge of the top panel 16; 116. That is to say the flap 70; 170 does not fill or complete the recessed end edge in an unfolded condition.

The flaps 60, 70; 160, 170 are folded inwardly about a hinged connection to the carton panel 12, 16; 112, 116 more than 90 degrees so as to be substantially in face-to-face relationship with the panel 12, 16; 112, 116 to which it is hinged.

The article carrier 90; 190 may be of the wrap-around type, comprising a composite wall 12/20; 112/120 formed from two panels 12, 20; 112, 120 secured together. The composite wall 12/20; 112/120 may be a bottom wall of the tubular structure.

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. The illustrated embodiments show cartons or blanks for forming an article carrier of the wraparound style; in other embodiments, the article carrier may take an alternative format or styles and may employ one or more of the features of the present disclosure.

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. An article carrier for packaging at least one article, the article carrier comprising a plurality of panels forming a tubular structure for surrounding at least one article and an article retention device for engaging said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure, the article retention device comprising a single engaging tab disposed at least in part in a recess at an end edge of one of the plurality of panels, wherein the engaging tab is hinged to said one of the plurality of panels along an oblique edge of the recess, and wherein the oblique edge is spaced apart from an adjacent side edge of said one of the plurality of panels.

2. An article carrier according to claim 1, wherein said one of the plurality of panels is a top panel.

3. An article carrier according to claim 1, wherein the engaging tab is disposed in registry with the at least one article received in the carrier.

4. An article carrier according to claim 1, wherein the recess is defined by the oblique edge, an opposed oblique edge and an intermediate edge extending between the oblique edges.

5. An article carrier according to claim 1, wherein the engaging tab comprises a first maximum width, and the recess comprises a second maximum width, the first maximum width of the engaging tab is greater than a half of the second maximum width of the recess.

6. An article carrier according to claim 1, wherein the engaging tab is disposed entirely within the recess.

7. An article carrier according to claim 1, wherein the article retention device is located in a recess defined in an end of said one of the plurality of panels and does not increase the footprint of the panel from which it is struck.

8. An article carrier according to claim 1, wherein engaging tab partially defines a recess edge of said one of the plurality of panels.

9. An article carrier according to claim 1, wherein the engaging tab is folded inwardly about a hinged connection to said one of the plurality of panels more than ninety degrees so as to be substantially in face-to-face relationship with the panel to which it is hinged.

10. An article carrier according to claim 1, wherein the article carrier is of the wrap-around type, comprising a composite wall formed from two panels secured together.

11. An article carrier according to claim 1, wherein the composite wall is a bottom wall of the tubular structure.

12. An article carrier for packaging at least one article, the article carrier comprising a plurality of panels forming a tubular structure for surrounding at least one article and an article retention device for engaging said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure, the plurality of panels including a pair of overlapping panels forming a composite wall of the tubular structure, wherein the article retention device comprises an engaging tab hinged to a free edge of one of the pair of overlapping panels along an oblique hinged connection.

13. An article carrier according to claim 12, wherein the oblique hinged connection is angled to prevent the engaging tab from interfering with a machine access opening when the engaging tab is folded thereabout.

5

14. An article carrier according to claim 12, wherein the oblique hinged connection is a single oblique fold line.

15. An article carrier according to claim 12, wherein the article carrier is of the wrap-around type, comprising a composite wall formed from two panels secured together and composite wall is a bottom wall of the tubular structure.

16. An article carrier according to claim 12, wherein the engaging tab is folded inwardly about a hinged connection to said one of the pair of overlapping panels more than ninety degrees so as to be substantially in face-to-face relationship with the panel to which it is hinged.

17. An article carrier for packaging at least one article, the article carrier comprising a plurality of panels forming a tubular structure for surrounding at least one article and an article retention device for engaging said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure, the plurality of panels including a pair of overlapping panels forming a composite wall of the tubular structure, the article retention device comprising an engaging tab hinged to a free edge of one of the pair of overlapping panels and having a recess along its free end edge.

18. An article carrier according to claim 17, wherein the recess is positioned and sized such that it is brought into registration with at least a part of a machine access opening when the engaging tab is held in its folded position.

19. An article carrier according to claim 17, wherein the article carrier is of the wrap-around type, comprising a composite wall formed from two panels secured together and composite wall is a bottom wall of the tubular structure.

20. An article carrier according to claim 17, wherein the engaging tab is folded inwardly about a hinged connection to said one of the pair of overlapping panels more than

ninety degrees so as to be substantially in face-to-face relationship with the panel to which it is hinged.

21. A package comprising the combination of an article carrier and at least one article having a recess, the article carrier comprising a plurality of panels forming a tubular structure surrounding the at least one article and an article retention device engaging a recess of said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure, the article retention device comprising a single engaging tab disposed in, and defining, at least in part, a cutaway at an end edge of one of the plurality of panels, wherein the engaging tab is hinged, by a hinged connection, to said one of the plurality of panels along an oblique edge of the cutaway, and wherein the oblique edge is spaced apart from an adjacent side edge of said one of the plurality of panels, the engaging tab being folded inwardly about the hinged connection more than ninety degrees so as to be substantially in face to face relationship with said one of the plurality of panels and in engagement with the recess in the article.

22. A package comprising the combination of an article carrier and at least one article having a recess, the article carrier comprising a plurality of panels forming a tubular structure surrounding at least one article and an article retention device engaging said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure, the plurality of panels including a pair of overlapping panels forming a composite wall of the tubular structure, the article retention device comprising an engaging tab hinged to a free edge of one of the pair of the pair of overlapping panels along an oblique hinged connection, the engaging tab being folded inwardly about the oblique hinged connection more than ninety degrees so as to be substantially in face to face relationship with said one of the plurality of panels and in engagement with the recess in the article.

23. A package comprising the combination of an article carrier and at least one article having a recess, the article carrier comprising a plurality of panels forming a tubular structure surrounding at least one article and an article retention device engaging said

at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure, the plurality of panels including a pair of overlapping panels forming a composite wall of the tubular structure, the article retention device comprising an engaging tab hinged, by a hinged connection, to a free edge of one of the pair of overlapping panels and having a recess along its free end edge, the engaging tab being folded inwardly about the hinged connection more than ninety degrees so as to be substantially in face to face relationship with said one of the plurality of panels and in engagement with the recess in the article.

24. A blank for forming an article carrier, the blank comprising a plurality of panels for forming a tubular structure for surrounding at least one article and an article retention device for engaging said at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure in a setup article carrier, the article retention device comprising a single engaging tab disposed at least in part in a recess at an end edge of one of the plurality of panels, wherein the engaging tab is hinged to said one of the plurality of panels along an oblique edge of the recess, and wherein the oblique edge is spaced apart from an adjacent side edge of said one of the plurality of panels.

25. A blank for forming an article carrier, the blank comprising a plurality of panels forming a tubular structure for surrounding at least one article and an article retention device for engaging the at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure in a setup article carrier, the article retention device comprising an engaging tab hinged to a free edge of one of the pair of overlapping panels along an oblique hinged connection.

26. A blank for forming an article carrier, the blank comprising a plurality of panels forming a tubular structure for surrounding at least one article and an article retention device for engaging the at least one article to inhibit dislodgement of the article from at least one of opposite open ends of the tubular structure in a setup article carrier, the article retention device comprising an engaging tab hinged to a free edge of one of the pair of overlapping panels and having a recess along its free end edge.

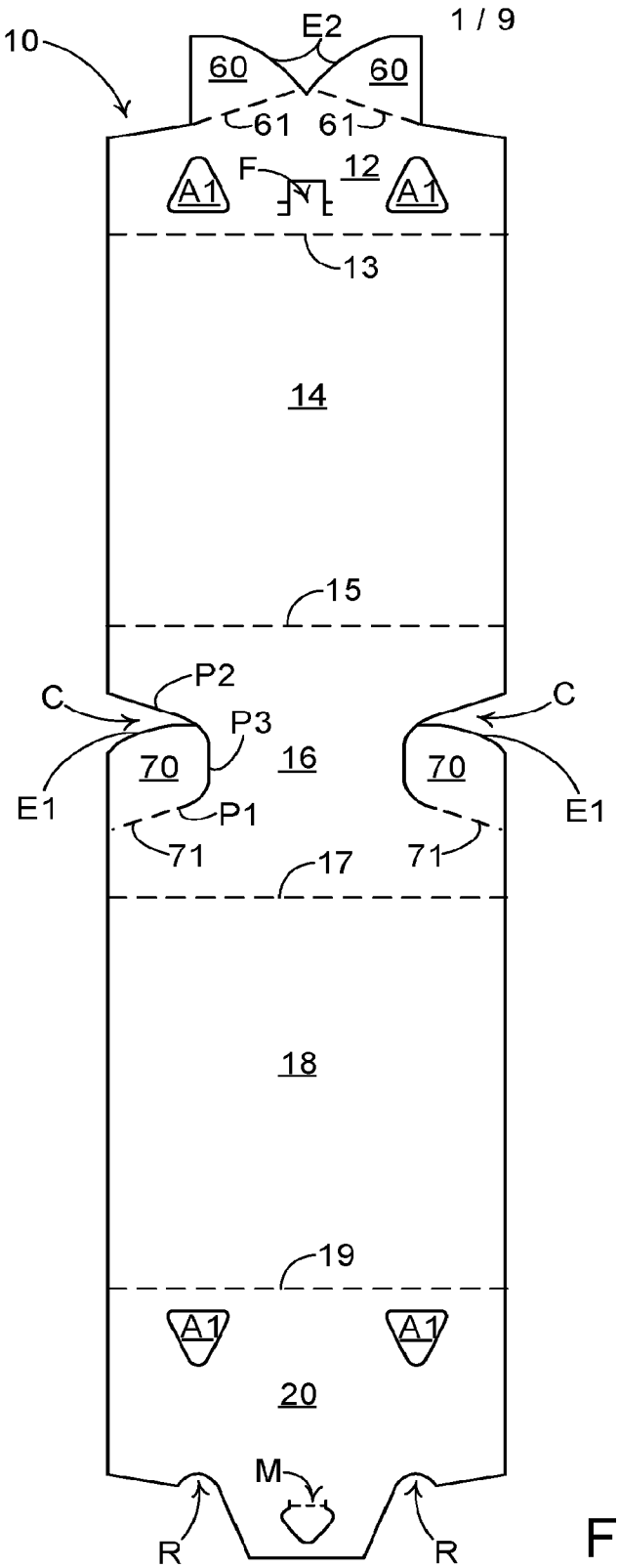

10
E2
60
60
61
61
A1
F
12
A1
13
14
15
C
P2
P3
C
70
16
70
E1
P1
E1
71
71
17
18
19
A1
A1
20
M
R
R

FIG. 1

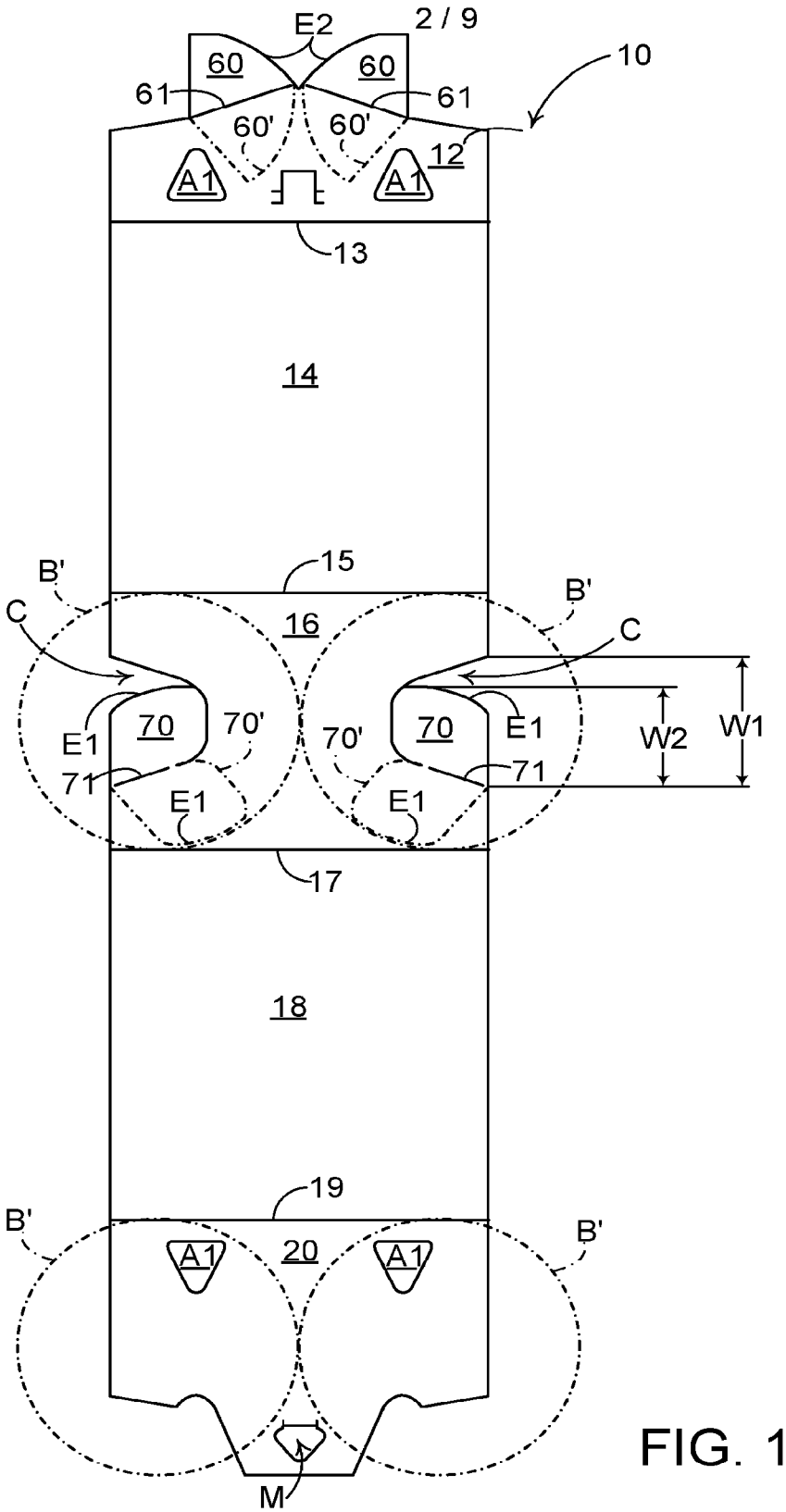

E2
60
60
61
61
60'
60'
10
12
A1
A1
13
14
15
B'
B'
C
C
16
70
70'
70'
70
E1
E1
71
71
E1
E1
W2
W1
17
18
19
B'
B'
A1
20
A1
M

FIG. 1B

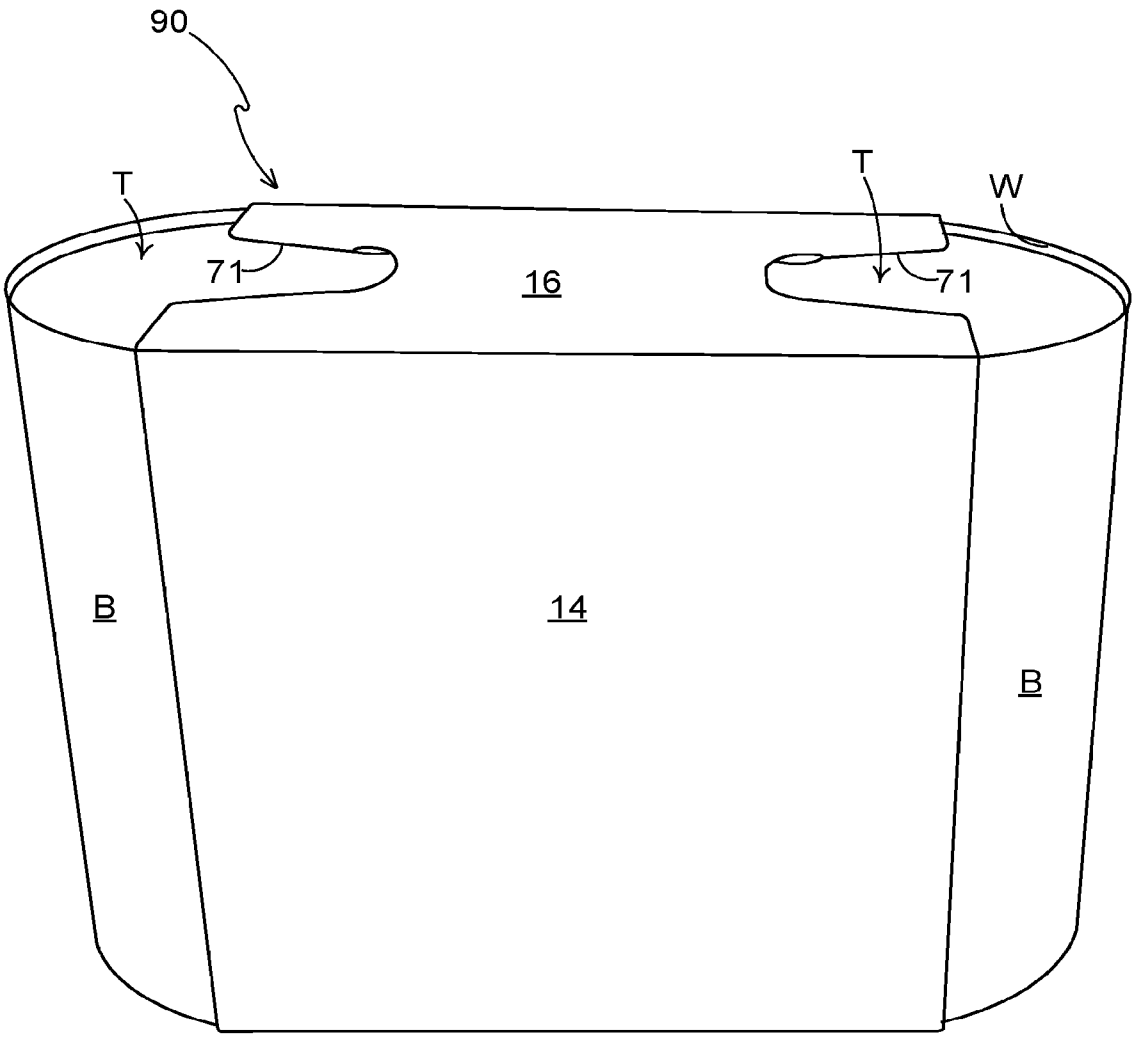


FIG. 2

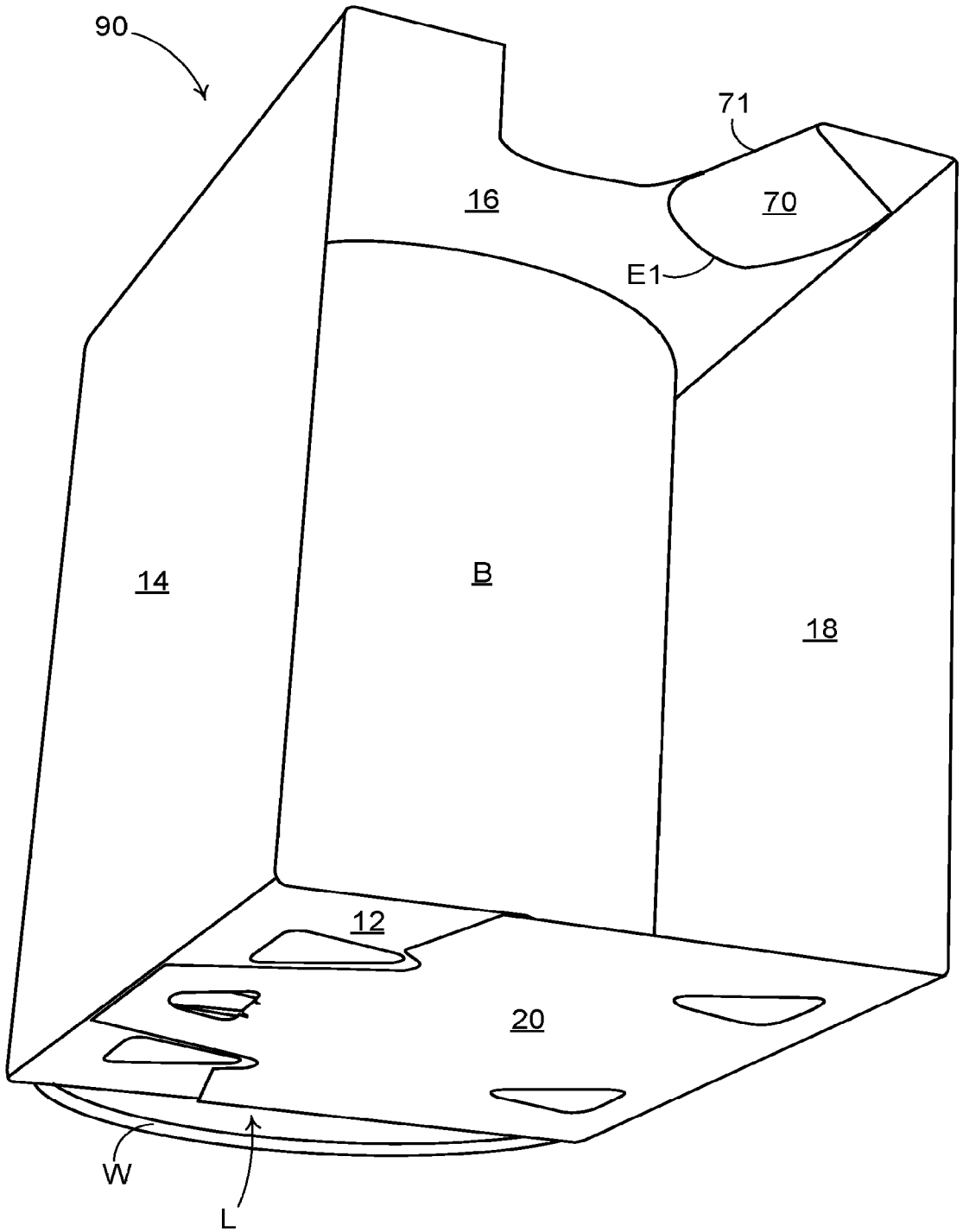


FIG. 3

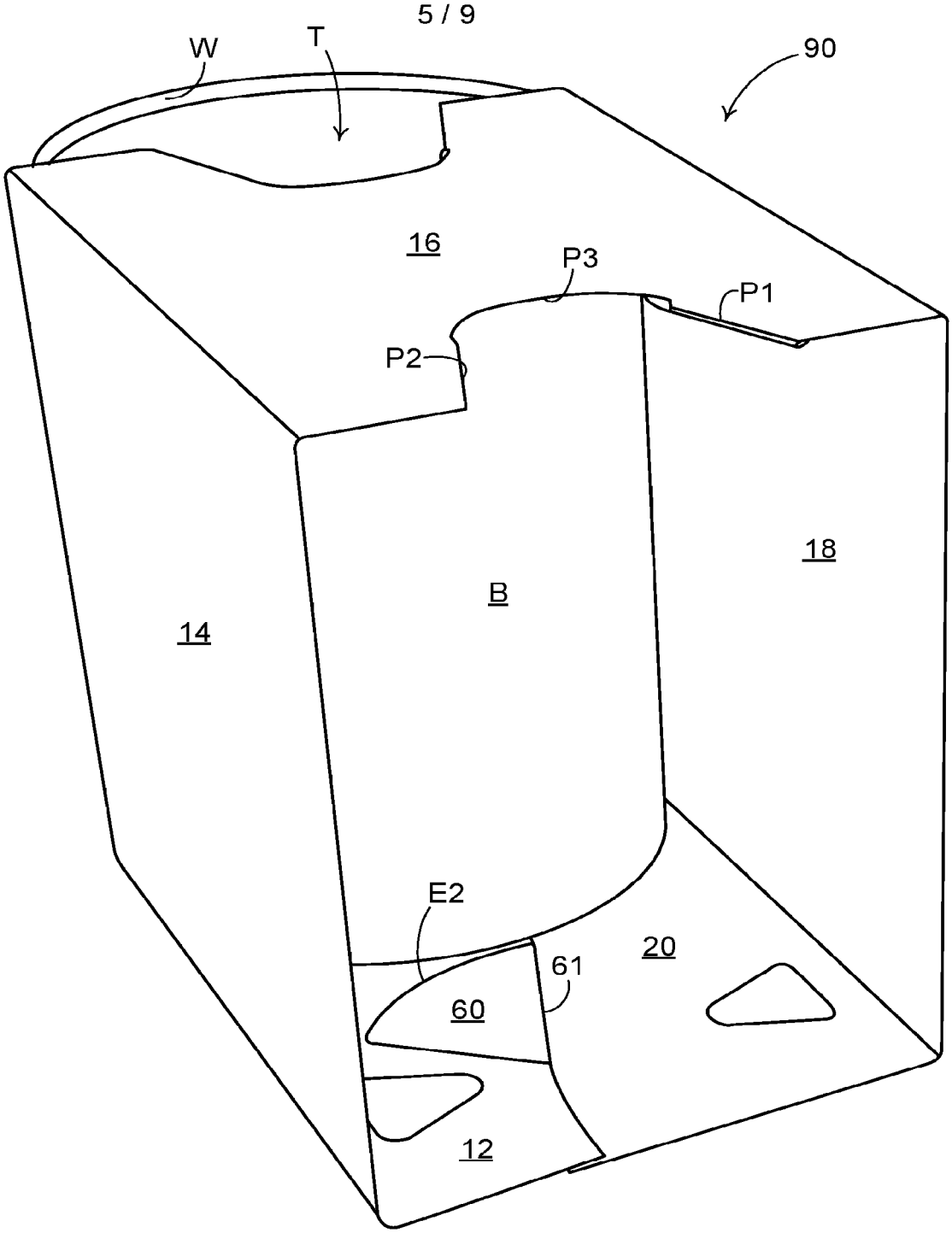


FIG. 4

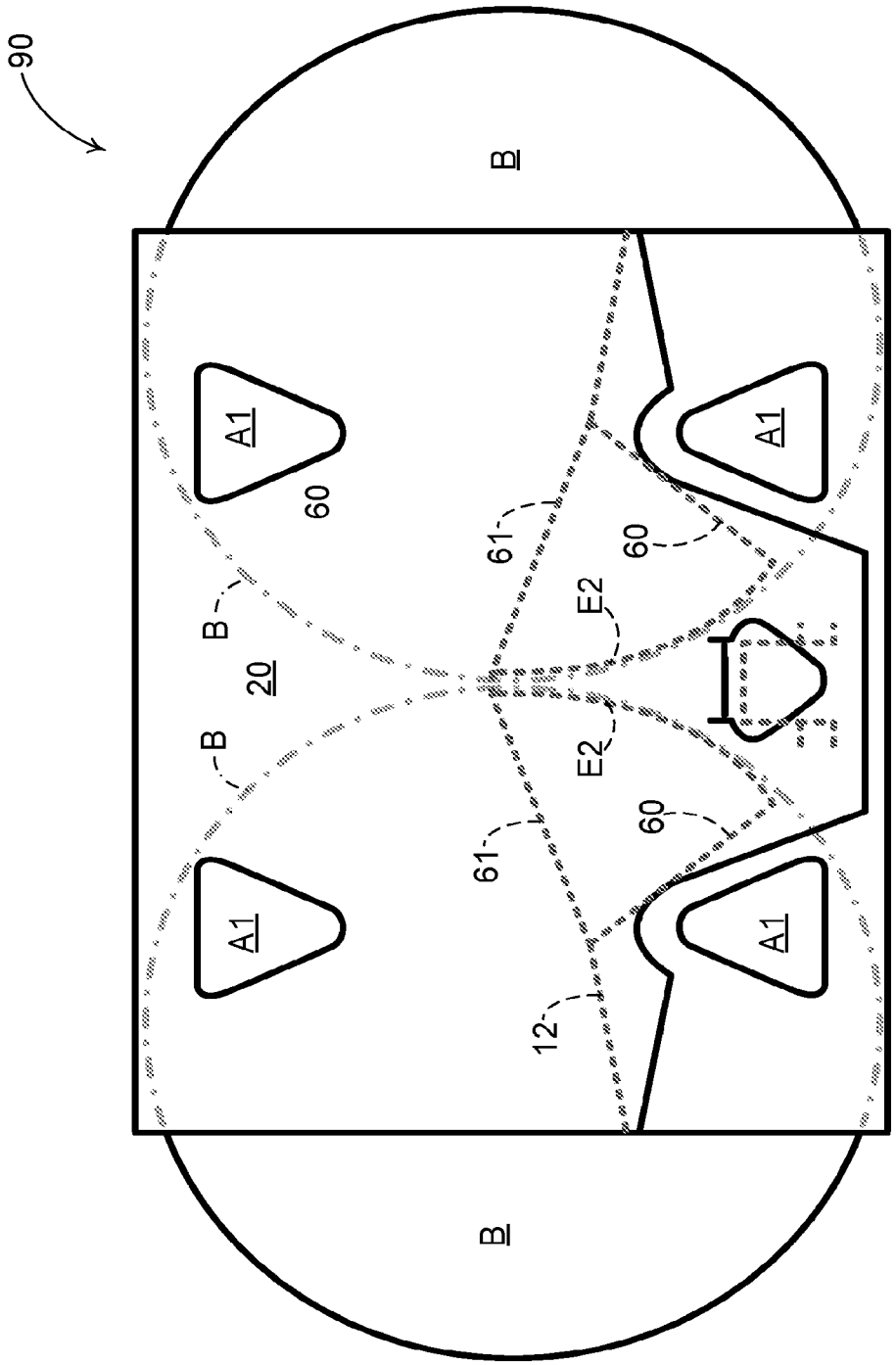


FIG. 5

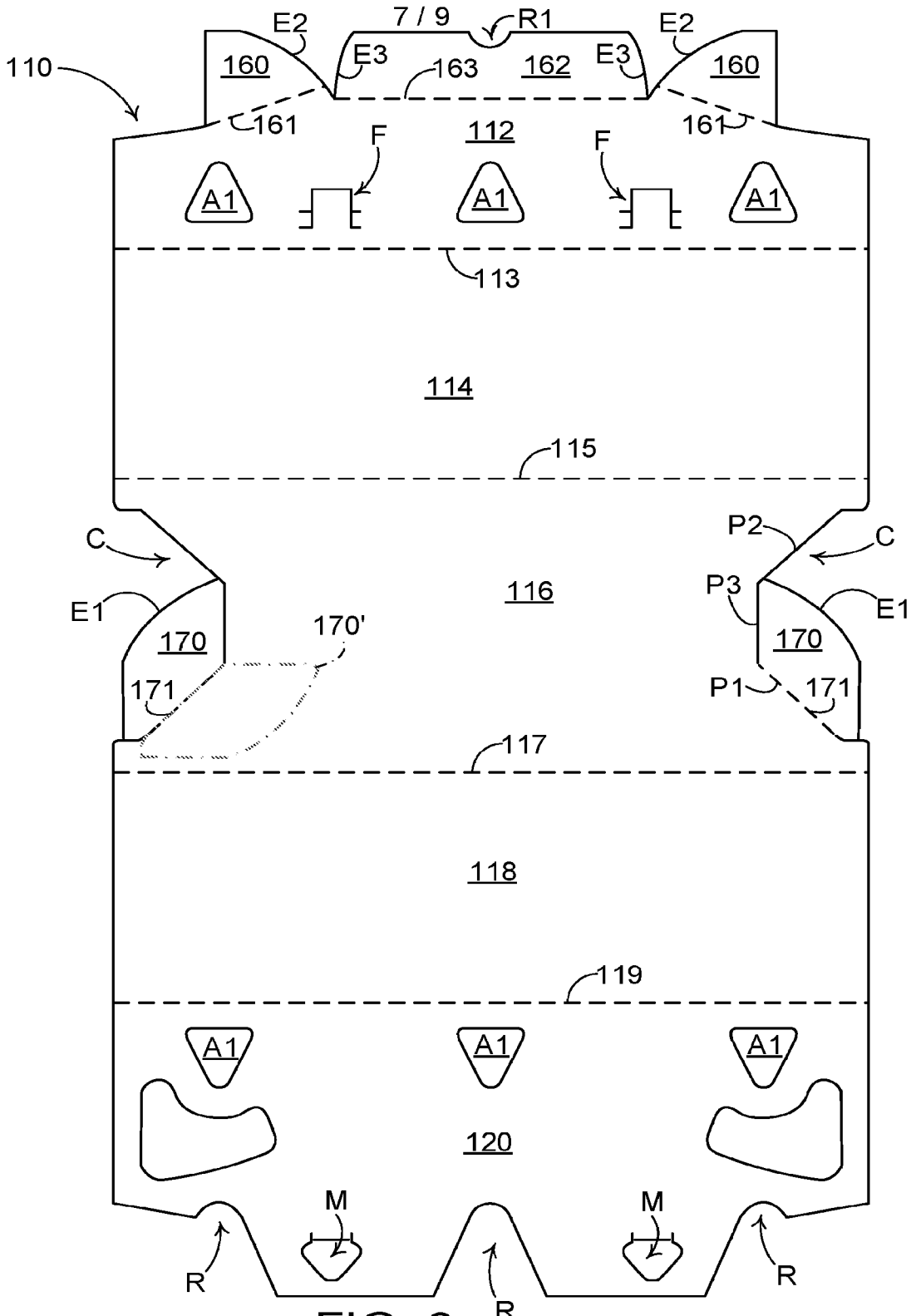

110
E2
160
E3
163
R1
162
E3
E2
160
161
161
F
112
F
A1
A1
A1
113
114
115
C
P2
C
E1
116
P3
E1
170
170'
170
171
P1
171
117
118
119
A1
A1
A1
120
M
M
R
R
R

FIG. 6

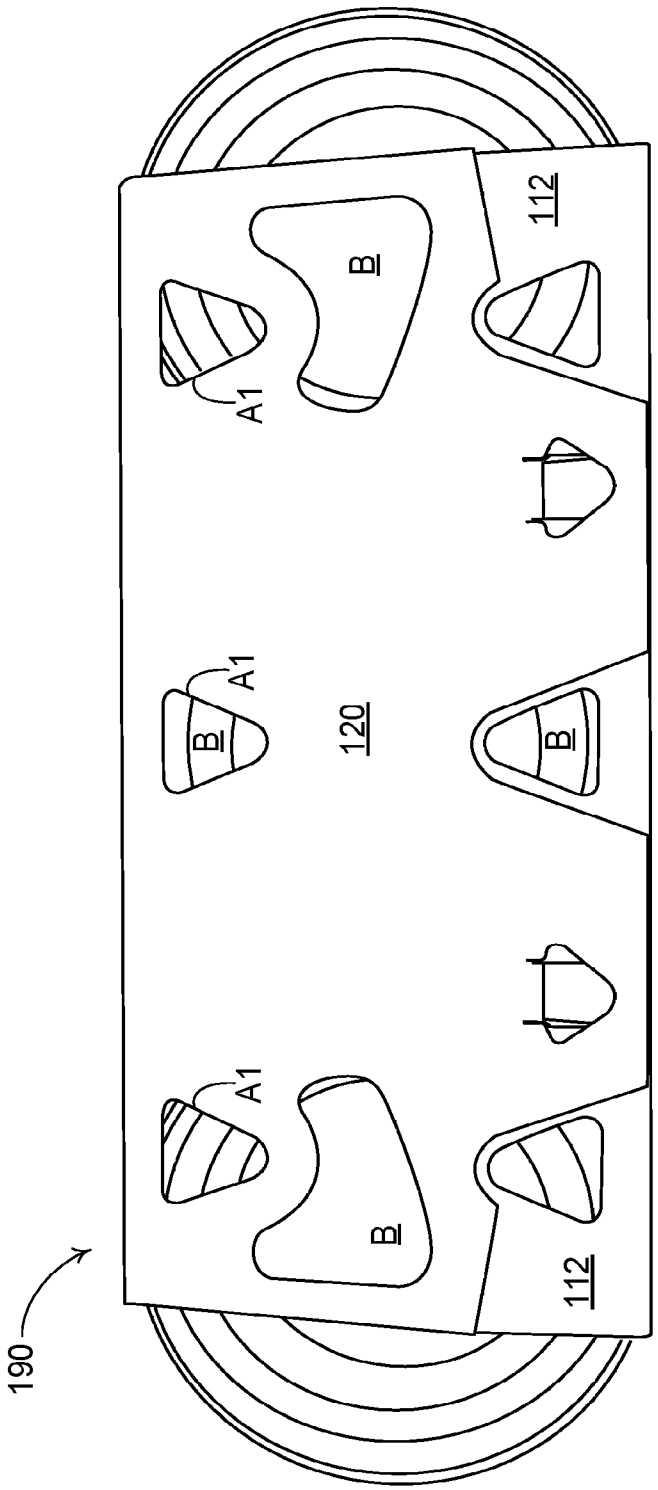


FIG. 7

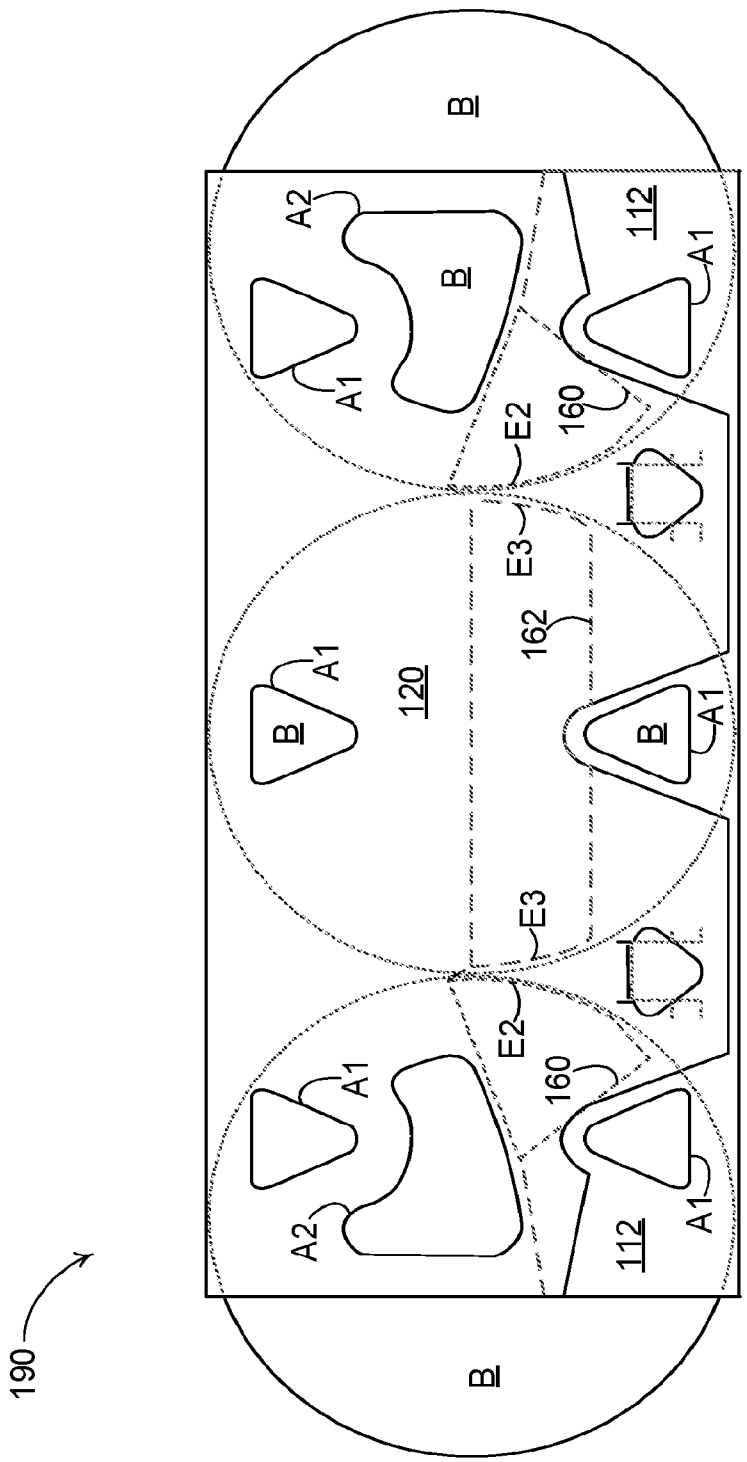

190
B
A2
A1
B
112
A1
E2
160
E3
162
120
B
A1
B
A1
E3
E2
160
A1
A2
112
A1
B

FIG. 8

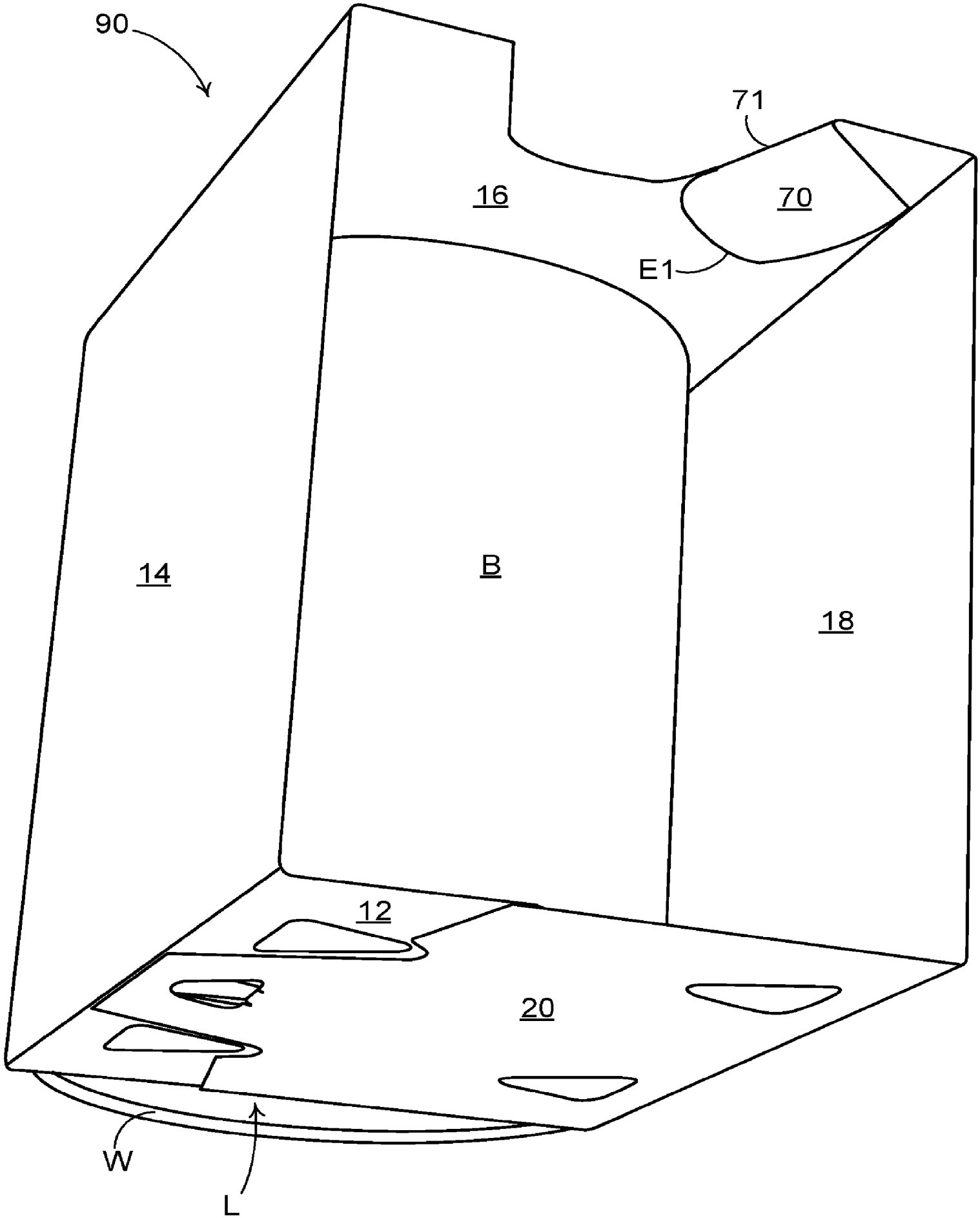


FIG. 3