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### (54) PANEL FRAME STRUCTURE FOR A LUGGAGE ARTICLE

(57) A panel frame structure for a luggage article (100) is provided. The luggage article (100) may include a fabric panel (140) having an outer periphery (210) and a pocket (212) having edges defining an inner periphery (218) defined inwardly from the outer periphery (210), and a frame (178) defining a closed loop corresponding

at least partially to the outer periphery (210) of the fabric panel (140). The frame (178) may be received within the pocket (212) unattached to the fabric panel (140) and outwardly biased against the inner periphery (218) of the pocket (212).

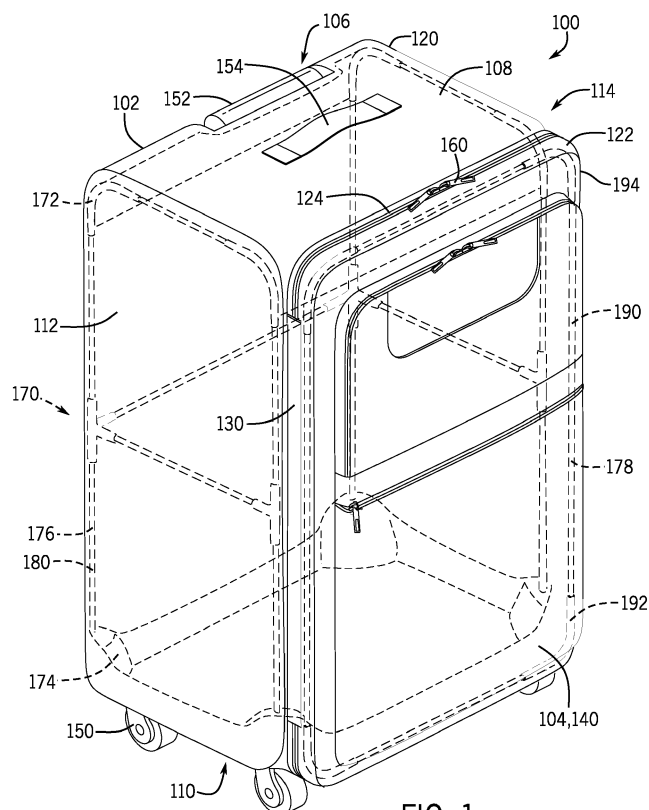


FIG. 1

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## Description

### TECHNICAL FIELD

**[0001]** The present disclosure relates generally to luggage articles, and more specifically to a panel frame structure for a luggage article.

### BACKGROUND

**[0002]** Some softside luggage cases include a frame structure or arrangement to support a luggage case housing. Traditional frame configurations, however, include frame structures that are fixed (e.g., stitched) to the luggage case. In some luggage cases, the structure attaching the frame structure to the luggage case housing presents visible indications of such attachment, such as piping or other visible binding on the exterior of the luggage case. Some luggage cases also include stitched closed sleeves with small openings at the ends thereof to receive frame members (e.g., rods) to secure the frame members to the panels of the luggage case. Such configurations may add unnecessary weight to the luggage case. Visible indications of the frame structure may also limit creativity in the aesthetic design of the luggage case.

**[0003]** It is therefore desirable to provide an improved luggage case, and more specifically an improved frame structure that addresses one or all of the above described problems and/or which more generally offers improvements or an alternative to existing arrangements.

**[0004]** Documents that may be related to the present disclosure include DE202010004883U1, EP2363037B1, EP2779861A1, EP2873342A1, FR2949950A1, GB2184940A, GB2440206B, GB2441580B, GB2477087A, US7896143B2, US7984797B2, US8727083B2, US2016235173A1, and US2017000232A1.

### SUMMARY

**[0005]** The present disclosure provides a panel frame structure for a luggage article, as described below and defined in the accompanying claims. The luggage article includes a fabric panel and a frame supporting the fabric panel. The fabric panel may include a pocket or void space arranged to receive the frame therein. As described below, the frame may be received within the pocket unattached to any portion of the luggage article such that the frame "floats" within the pocket. More specifically, the frame may be biased against an inner periphery of the pocket to hold the frame in place. In this manner, the frame may be secured in place without additional (or visible) elements. Additionally, the frame may tension the fabric of the pocket.

**[0006]** This arrangement of not fixing the frame to the panel by means of stitching or stitched closed pockets or otherwise simplifies the manufacturing steps and assembly of the luggage article. Moreover, the biasing of

the frame within the pocket, and forming the pocket of sufficient size to overlap the frame edges, sufficiently retains the frame within the panel, without the frame inadvertently falling out of the pocket and without such need for additional, more secure fixation as has been traditionally adopted with more fully stitched pockets.

**[0007]** Embodiments of the present disclosure may include a fabric panel and a frame supporting the fabric panel. The fabric panel may include an outer periphery and a pocket having edges defining an inner periphery defined inwardly from the outer periphery. The frame may define a closed loop corresponding at least partially to the outer periphery of the fabric panel. The frame may be received within the pocket unattached to the fabric panel and outwardly biased against the inner periphery of the pocket.

**[0008]** In some embodiments, the pocket may be defined inwardly around the inside of the fabric panel. The pocket may be located and open to the inside of the fabric panel. The fabric panel may include an exterior surface and an interior surface. The pocket may be defined on the interior surface of the fabric panel. The pocket may be a fabric pocket.

**[0009]** In some embodiments, the pocket may define an opening inwardly from the outer periphery of the fabric panel and through which the frame is received to position the frame within the pocket. The opening may extend around the entirety of the inner periphery of the pocket.

**[0010]** In some embodiments, the pocket may define a perimeter groove in which to receive the frame.

**[0011]** In some embodiments, the pocket may be defined by a fabric strip extending adjacent the outer periphery of the fabric panel, and preferably attached to the outer periphery of the fabric panel. The fabric strip may extend a distance inwardly from the outer periphery of the fabric panel. The fabric strip may include an inner perimeter edge with a perimeter smaller than the outer periphery of the fabric panel.

**[0012]** In some embodiments, the frame may be restrained by the pocket to outwardly tension the fabric panel.

**[0013]** In some embodiments, the frame may include interconnected elongate elements. The frame may include four elongate pulltrusions connected together by corner connectors. The elongate pulltrusions at each corner may be positioned at 90 degrees or greater than 90 degrees to each other.

**[0014]** In some embodiments, the fabric panel may include a front panel of the luggage article. The luggage article may include a base. The front panel may define a lid of the luggage article. The front panel may be hingedly connected to the base.

**[0015]** In some embodiments, the frame may be removable from the pocket and the fabric panel.

**[0016]** In some embodiments, the frame and the inner periphery of the pocket may be rectangular or square.

**[0017]** In some embodiments, the pocket may be defined by one or more inner panels with a slot opening

through which the frame is received.

**[0018]** In some embodiments, the luggage article may include a plurality of panels, each panel including a frame within a pocket.

**[0019]** Additional embodiments and features are set forth in part in the description that follows, and will become apparent to those skilled in the art upon examination of the specification or may be learned by the practice of the disclosed subject matter. A further understanding of the nature and advantages of the present disclosure may be realized by reference to the remaining portions of the specification and the drawings, which forms a part of this disclosure. One of skill in the art will understand that each of the various aspects and features of the disclosure may advantageously be used separately in some instances, or in combination with other aspects and features of the disclosure in other instances.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0020]** The description will be more fully understood with reference to the following figures in which components are not drawn to scale, which are presented as various embodiments of the present disclosure and should not be construed as a complete recitation of the scope of the disclosure, characterized in that:

FIG. 1 is an isometric view of a luggage article showing an internal frame structure in dash for illustration purposes;

FIG. 2 is an exploded isometric view of a frame of the frame structure;

FIG. 3 is a rear fragmentary isometric view of a fabric panel of the luggage article, with other portions of the luggage article removed for clarity, and showing the frame positioned above an opening in the fabric panel and ready for insertion into a pocket through the opening, and showing the frame inserted within the pocket (in dash);

FIG. 4 is a partial cut-away view of the fabric panel shown in Fig. 3 and showing the frame within the pocket and engaging an inner periphery thereof;

FIG. 5 is a fragmentary cross-sectional view of the frame within the pocket and taken along line 5-5 of FIG. 4;

FIG. 6 is a rear fragmentary isometric view of an additional embodiment of the fabric panel of the luggage article, and showing the frame engaging an inner periphery of the pocket formed by a channel structure or groove, with other portions of the luggage article removed for clarity; and

FIG. 7 is a fragmentary cross sectional view of the frame within the pocket and taken along line 7-7 of Fig. 6.

#### DETAILED DESCRIPTION

**[0021]** According to the present disclosure, a frame

structure is provided that is configured to support a fabric panel of a luggage article, such as the front panel of the luggage article. The frame structure includes a frame that is positioned within a pocket or void space defined by or within the fabric panel. As explained below, the frame "floats" within the pocket to provide structural support and/or shape to the fabric panel. More specifically, the frame is not fixedly attached to the pocket or to any other portion of the fabric panel during use. Rather, the frame engages and biases outwardly against an inner periphery of the pocket. In one embodiment, the bias provided by the frame may create a tension force in the material of the fabric panel.

**[0022]** According to an embodiment of the present disclosure, illustrated in FIG. 1, a luggage article 100 includes a housing 102 formed from a plurality of walls or panels (hereinafter "panels" for the sake of convenience without intent to limit) defining an internal storage volume in which to carry a user's belongings. In one embodiment, the luggage article 100 includes opposing front and rear panels 104, 106 and a plurality of side panels extending between the front and rear panels 104, 106. For example, the luggage article 100 may include opposing top and bottom panels 108, 110 and opposing left and right side panels 112, 114 that collectively define the housing 102 in combination with the front and rear panels 104, 106. The various panels may be configured or arranged to provide a desired size and shape of the housing 102. For example, the various panels may be sized and shaped such that the luggage article 100 is taller than it is wide, wider than it is deep, or the like.

**[0023]** With continued reference to FIG. 1, the luggage article 100 may include a base 120 and a lid 122 defined by a line of separation 124. The luggage article 100 may be transformable between different configurations, such as between a closed configuration and an open configuration, via relative movement between the lid 122 and the base 120. For example, the lid 122 may be hingedly attached to the base 120, such as by a hinge structure 130 or similar mechanism. In such embodiments, the lid 122 may be pivoted towards or away from the base 120 to close or open the luggage article 100, respectively. The lid 122, which may be referred to as a first luggage portion or section, may be defined by many combinations of panels. For example, the lid 122 may be defined by the front panel 104, either entirely or in part. In some embodiments, the lid 122 may be defined by the front panel 104 and at least portions of the top, bottom, left side, and/or right side panels 108, 110, 112, 114 such that the lid 122 includes sidewall portions. In like manner, the base 120, which may be referred to as a second luggage portion or section, may be defined by many combinations of remaining panels. For instance, the base 120 may be defined by the rear, top, bottom, left side, and right side panels 106, 108, 110, 112, 114. The hinge structure 130 may be a fabric strip, a piano hinge, a living hinge, spaced-apart discrete hinges, a zipper structure, an articulating joint made of elastomeric material, or the

like.

**[0024]** The luggage article 100 illustrated in FIG. 1 is an upright spinner case, such as a softside luggage case, but may be any type of luggage article 100, such as a purse, a bag, a container, a backpack, etc. In like manner, the housing 102 of the luggage article 100 may be formed at least partially from softside material, entirely from softside material, entirely from hardside material, or in a hybrid construction of softside material and hardside material. For example, at least one of the various panels may be formed from softside material with the remaining panels formed from any combination of softside material and hardside material. In one embodiment, the base 120 may be formed completely from hardside material, with the lid 122 formed at least partially from softside material. In this manner, the luggage article 100 may include at least one fabric panel 140. The fabric panel 140 may be any panel or combination of panels of the luggage article 100, such as the front panel 104, the left side panel 112, or the right side panel 114, or any combination thereof. As described more fully below, the fabric panel 140 is supported structurally separate from the rest of the luggage article 100. For instance, the fabric panel 140 may be associated with a frame assembly separate from any other structural element of the luggage article 100.

**[0025]** In some embodiments, the luggage article 100 may include one or more support members 150 to support the luggage article 100 against a support surface (e.g., against the ground). The support members 150, which may be a foot, a fixed wheel assembly, a spinner wheel assembly, or any combination thereof, may be positioned on any suitable panel, such as on the bottom panel 110. In some embodiments, the luggage article 100 may also include one or more carry handles and/or a retractable tow handle 152. For example, as shown in FIG. 1, the luggage article 100 may include a top carry handle 154 coupled to the top panel 108. With continued reference to FIG. 1, the retractable tow handle 152 may be extendable from the top panel 108 (such as from adjacent the intersection between the top and rear panels 108, 106) of the luggage article 100.

**[0026]** The luggage article 100 may include a closure mechanism 160 to selectively secure the lid 122 and the base 120 together. The closure mechanism 160 may be positioned along or adjacent the line of separation 124 between the lid 122 and the base 120 (such as along a periphery of the lid 122, etc.) to allow selective actuation for opening and closing of the luggage article 100. In an open configuration, the closure mechanism 160 is disengaged along substantially the entire length of the line of separation 124, thereby allowing the lid 122 and the base 120 to pivot relative to each other to any amount from partially open to fully open. In a closed configuration, the closure mechanism 160 is engaged along at least a portion of the length of the line of separation 124 to limit relative movement between the lid 122 and the base 120. The closure mechanism 160 may be any suitable closure device or system. For instance, the closure mechanism

160 may be a zip closure or attachment, though other types of closure devices are contemplated, including one or more latches spaced along the line of separation 124. In one embodiment, the zip attachment may extend along at least three edges of the lid 122, the hinge structure 130 being positioned on a remaining edge of the lid 122.

**[0027]** Continuing to refer to FIG. 1, the luggage article 100 includes a frame structure 170 supporting the housing 102. The frame structure 170, which may be positioned at least partially internal to the housing 102, may include various elements, either interconnected together, positioned separately from one another, or a combination of both. For example, the frame structure 170 may include a top pan structure 172, a bottom pan structure 174, and one or more panel frames, such as a pair of side panel frames 176 and a frame 178. The side panel frames 176 may be connected to and extend between the top and bottom pan structures 172, 174 to define a frame assembly 180 for the base 120. For example, the top pan structure 172, the bottom pan structure 174, and the pair of side panel frames 176 may be connected together to support the top panel 108, the bottom panel 110, and the opposing left and right side panels 112, 114 of the base 120, respectively. The frame 178, on the other hand, may be separate from any other element of the frame structure 170 to provide independent support of the lid 122. For instance, the frame 178 may be associated with the fabric panel 140 (e.g., the front panel 104) to support the fabric panel 140 irrespective and independent of the support provided to other portions of the housing 102. Though the figures illustrate the frame 178 associated with the front panel 104 of the luggage article 100, the frame 178 may independently support any fabric panel of a piece of luggage.

**[0028]** As noted briefly above, the housing 102 may cover at least a portion of the frame structure 170. For example, portions of the frame structure 170 (e.g., the top pan structure 172, the bottom pan structure 174, the side panel frames 176, and/or the frame 178) may be positioned within the housing 102 of the luggage article 100. In this manner, the frame structure 170 may be covered by the material of the housing 102, such as covered by softside material. In one embodiment, at least portions of the frame structure 170 may be received in a hem, a pocket, one or more discrete loops, or a groove defined within the housing 102, as described below. In these embodiments, the hem, pocket, loops, or groove may be positioned or secured along at least portions of the frame structure 170 to couple the frame structure 170 to the housing 102. In embodiments having a hybrid case construction, the frame structure 170 may be coupled to the hardside material and/or the softside material. For example, portions of the frame structure 170 (e.g., the top pan structure 172, the bottom structure, and/or the side panel frames 176) may be formed integrally with the hardside material defining a portion of at least one panel of the housing 102. In some embodiments, the frame structure 170 may be coupled to the hardside material via fasten-

ers, corresponding retention features, adhesive, or the like.

**[0029]** FIG. 2 is an exploded isometric view of the frame 178. As shown in FIGS. 1 and 2, the frame 178 includes interconnected elongate elements 190, which may define a closed loop in some embodiments. The elongate elements 190 may be connected together via corner connectors 192. In one embodiment, the frame 178 may include four elongate elements 190 connected together by four corner connectors 192, though other suitable configurations are contemplated. For example, the frame 178 may be characterized as substantially any permutation of elongate elements 190 and corner connectors 192. For instance, the frame 178 may be defined by any number of elongate elements 190 (e.g., one elongate element 190, two elongate elements 190, three elongate elements 190, four elongate elements 190, five elongate elements 190, etc.) and any number of corner connectors 192 (e.g., no corner connectors 192, one corner connector 192, two corner connectors 192, three corner connectors 192, four corner connectors 192, five corner connectors 192, etc.). Depending on the particular application, the frame 178 may include an equal number of elongate elements 190 and corner connectors 192, or may include a different number of elongate elements 190 compared to corner connectors 192 (e.g., more elongate elements 190 than corner connectors 192, less elongate elements 190 than corner connectors 192, etc.).

**[0030]** The frame 178 is sized to match a dimension of the fabric panel 140 to tension the fabric panel 140 and be retained therewith. For example, as detailed below, the frame 178 may be outwardly biased against a peripheral edge 194 of the fabric panel 140 to suitably tension the fabric panel 140 for use. In such embodiments, the frame 178 may engage at least a portion of the inside of the peripheral edge 194 of the fabric panel 140 and bias outwardly to create a tension force in the fabric panel 140. As described more fully below, the frame 178 may not be affixed to the fabric panel 140 other than by an outwardly or inwardly biased force against the fabric panel 140. As described herein, "inwardly" means within or generally towards the interior (e.g., the center) of the fabric panel 140, such as generally in the directions marked "D" in FIG. 2. In like manner, "outwardly" means generally away from the center of the fabric panel 140, such as generally opposite the directions marked "D" in FIG. 2. As used herein, "interior" means inner, within, or inside, such as within the internal storage volume of the housing 102 when the luggage article 100 is in the closed configuration. Similarly, "exterior" means situated on or relating to the outside of the housing 102 when the luggage article 100 is in the closed configuration. Additionally, the peripheral edge 194 may define a periphery or a peripheral portion of any area of the fabric panel 140, such as an entire frontal area of the fabric panel 140, a smaller limited area of the fabric panel 140, or the like.

**[0031]** In some embodiments, the frame 178 may be formed from planar strips, such that the elongate ele-

ments 190 and the corner connectors 192 are positioned within a common plane. As shown, the frame 178 may form a substantially rectangular shape with rounded corners, though the frame 178 may be formed in other suitable shapes, such as trapezoidal or circular, among others. The elongate elements 190, which may be elongate pulltrusions, rods, wires, or the like, may extend in a straight or a substantially straight line, may be curved along their lengths, or may include a combination of straight and curved segments. The elongate elements 190 may provide a lightweight characteristic to the frame 178. In addition, the elongate elements 190 may provide a composite structure of the frame 178 that is relatively strong for its weight. The elongate elements 190 may include a diameter ranging between about 2mm to about 10mm (preferably between about 3.5mm to about 6.5mm), though other dimensions are contemplated depending on the size, weight, and/or strength requirements of the frame 178.

**[0032]** The corner connectors 192 may be shaped to position adjacent elongate elements 190 at a desired angle to each other. For instance, the corner connectors 192 may be shaped such that the elongate elements 190 at each corner are positioned at or substantially at 90 degrees relative to each other. In some embodiments, the corner connectors 192 may be shaped such that the elongate elements 190 at each corner are positioned at an angle greater than 90 degrees to create an outward force on the material of the fabric panel 140 over the whole circumference of the fabric panel 140 and not just in the corners. For example, the elongate elements 190 at each corner may extend at about or greater than a 95 degree angle to each other to pretension the fabric panel 140 outwardly. Each corner connector may be curved and may be formed from the same or different material of the elongate elements 190. The curved characteristic of the corner connectors 192 may allow smooth positioning of the frame 178 relative to the fabric panel 140 and/or limit damage to the fabric panel 140, especially when compared to frame corners having sharp edges. As shown in FIG. 2, each corner connector 192 may have a main body 196 defining one or more recesses 198 to receive the elongate elements 190.

**[0033]** The elongate elements 190 may be connected to the corner connectors 192 in substantially any manner. For instance, the elongate elements 190 may include end regions 200 designed to be slid into or otherwise positioned within the recesses 198 defined in the corner connectors 192. This may allow simple and quick assembly of the frame 178. For instance, engagement of the elongate elements 190 within the recesses 198 may reduce or eliminate the need for mechanical fasteners (e.g., rivets or screws) for assembly. In one embodiment, the end regions 200 and/or the recesses 198 may be configured such that the end regions 200 are interference fit within the recesses 198. For instance, the end regions 200 of the elongate elements 190 may be sized annularly larger than the recesses 198 to frictionally engage the elongate

elements 190 within the recesses 198. In one embodiment, each recess 198 may define a gap in a sidewall of the main body 196 to allow resilient expansion of the recess 198 upon insertion of the elongate elements 190 therein. Additionally or alternatively, the elongate elements 190 (e.g., the end regions 200 of the elongate elements 190) may be formed from material or constructed in a manner permitting resilient deformation thereof to accommodate insertion of the elongate elements 190 within the recesses 198. The end regions 200 of the elongate elements 190 may be secured to the corner connectors 192 in other manners, such as via fasteners, heat or sonic welding, adhesive, or the like. In one embodiment, the elongate elements 190 may be formed integrally with the corner connectors 192, such as by the frame 178 being formed by a single wire or other loop.

**[0034]** The end regions 200 may have a circular or non-circular cross-section keyed to the profile shape of the recesses 198 of the corner connectors 192. A non-circular cross-section may limit twisting in the frame 178 by limiting rotation of the elongate elements 190 relative to the corner connectors 192. For example, a non-circular profile shape of the elongate elements 190 may limit rotation of the elongate elements 190 about their longitudinal axes, thereby limiting twisting or flexion of the frame 178 and the fabric panel 140 coupled thereto. The end regions 200 may have a teardrop, elliptical, polygonal, or other non-circular cross-section shape. In such embodiments, the recesses 198 defined in the corner connectors 192 may include a corresponding shape to matingly receive an end of the elongate elements 190 and limit rotation of the elongate elements 190 within the recesses 198.

**[0035]** The frame 178 may provide any desired aesthetic or functional property. For example, the frame 178 may be designed to be resiliently flexible or semi-rigid. In such embodiments, the frame 178 may resiliently deform or deflect during use, such as to absorb impacts to the luggage article 100 (e.g., to the fabric panel 140) and/or allow the frame 178 to be coupled to the fabric panel 140, as explained below. For example, the frame 178 may be designed to resist inward deformation or deflection. More specifically, as portions of the frame 178 are induced to deform or deflect inwardly (such as in the directions marked "D" in FIG. 2), the frame 178 may provide an outwardly directed biasing force resisting such deformation or deflection. The resistance to inward deformation or deflection may be provided by the material properties of the elongate elements 190, by the connection structure between the elongate elements 190 and the corner connectors 192, and/or by the relative positioning of the elongate elements 190 and the corner connectors 192. In one embodiment, the frame 178 may include one or more cross braces extending between two elongate elements 190 to limit inward deformation or deflection of the frame 178. For example, one or more cross braces may extend from a middle portion of one elongate element 190 to a middle portion of the elongate element

190 positioned at an opposite side of the frame 178.

**[0036]** The side panel frames 176 may be configured as desired. For example, each side panel frame 176 may include elongate members 204 interconnected together with one or more connectors 206, either fixedly or otherwise. In one embodiment, one or more of the elongate members 204 may be connected, either fixedly or removably, to the top pan structure 172 and/or to the bottom pan structure 174. The elongate members 204 may be connected to the connectors 206, the top pan structure 172, and/or the bottom pan structure 174 in any suitable manner, including a manner similar to that explained above with respect to the elongate elements 190 and the corner connectors 192. For instance, the elongate members 204 may be received at least partially within slots or cavities defined in the connectors 206, the top pan structure 172, and/or the bottom pan structure 174. In one embodiment, the side panel frames 176 may include one or more cross braces 208 connected to and extending between adjacent elongate members 204. The cross braces 208, which may add torsional and/or lateral rigidity to the side panel frames 176, may be positioned along the height of the luggage article 100 between the top pan structure 172 and the bottom pan structure 174.

**[0037]** FIG. 3 is an isometric view of the fabric panel 140, which may be the front panel 104. FIG. 6 is an isometric view of an additional embodiment of the fabric panel 140. Referring to FIGS. 3 and 6, the fabric panel 140 includes an outer periphery 210 defining the perimeter of the fabric panel 140. As shown, the closed loop defined by the frame 178 may correspond to the outer periphery 210 of the fabric panel 140. For example, the frame 178 may include the same or substantially the same shape and/or length as the outer periphery 210 of the fabric panel 140.

**[0038]** In one embodiment, the fabric panel 140 includes a pocket 212 defined inwardly from the outer periphery 210 of the fabric panel 140. Depending on the particular application, the pocket 212 may be an inside pocket or an outside pocket. For example, the pocket 212 may be located and open on the inside of the fabric panel 140. In these and other embodiments, the frame 178 is received within the pocket 212 to provide structural support for the fabric panel 140. In one embodiment, the frame may be removable from the pocket 212 and the fabric panel 140. In some traditional frame configurations, the fabric layers, zipper, and piping are joined fixed together with a visible stitching margin. This margin is then covered by a binding material. Although the binding material may be positioned inside some traditional luggage cases, such configurations may be considered as less finished. The construction of the present disclosure, however, allows the fabric panel 140 to be assembled with hidden seams as it can be turned inside out after the assembly stitching. Once the fabric panel 140 is turned inside out, the frame 178 may be inserted within the pocket 212 to tension the fabric panel 140. For example, once positioned within the pocket 212, the frame 178 is re-

strained within the pocket 212 and outer peripheral edges thereof to outwardly tension the fabric panel 140.

**[0039]** The pocket 212, which may be referred to as a peripheral pocket, may have substantially any shape or configuration. For example, the pocket 212 may be a fabric pocket, such as formed from one or more fabric sheets, panels, or strips. In one embodiment, illustrated in FIG. 3, the pocket 212 may be defined by two or more fabric sheets 214 at least partially attached (e.g., stitched) along or adjacent to the outer periphery 210 of the fabric panel 140, such as on the inside of the fabric panel 140. The fabric sheets 214 may, either collectively or individually, be considered an inner panel of the fabric panel 140. In such embodiments, the pocket 212 may be defined between the two or more fabric sheets 214 and an inner surface 216 of the fabric panel 140. The line of attachment of the fabric sheets 214 to the fabric panel 140 may define an inner periphery 218 of the pocket 212 for engagement of the frame 178 thereto, as described more fully below. As shown, the inner periphery 218 may be rectangular or square in shape. Depending on the particular application, the frame 178 may include a corresponding or dissimilar shape.

**[0040]** In the embodiments described herein, the pocket 212 may define an opening 220 through which the frame 178 is received to position the frame 178 within the pocket 212. For example, the two or more fabric sheets 214 may not be permanently or fixedly attached to one another to define a slit or slot opening 220 therebetween and through which the peripheral frame is received to position the peripheral frame within the pocket 212. The opening 220 may be defined inwardly from the outer periphery 210 of the fabric panel 140. For instance, the opening 220 may be defined at or adjacent the center of the fabric panel 140, within an upper portion of the fabric panel 140, within a lower portion of the fabric panel 140, or the like. In one embodiment, the opening 220 may extend around the entirety of the inner periphery 218 of the pocket 212. Depending on the particular application, the opening 220 may be selectively closed. For example, the opening 220 may be selectively closed by a zipper, hook and loop fasteners, snap fasteners, clips, or the like.

**[0041]** Once positioned within the pocket 212 (such as through the opening 220), the frame 178 may engage and bias outwardly against the inner periphery 218 of the pocket 212 (see FIGS. 4, 5, and 7). In one embodiment, the frame 178 may be slightly larger in size than the pocket 212 along at least one direction in order to bias outwardly against the inner periphery 218. In another embodiment, the frame 178 may be slightly smaller in size than the pocket 212 along at least one direction in order to bias inwardly against the inner periphery 218. In such embodiments, the outward bias of the frame 178 against the inner periphery 218 of the pocket 212 may create a tension force in the material of the fabric panel 140. The inner periphery 218 of the pocket 212 may be defined inwardly adjacent the outer periphery 210 of the fabric

panel 140.

**[0042]** In another embodiment, illustrated in FIGS. 6 and 7, the pocket 212 is much more open and may be defined by a fabric strip 230 extending adjacent the outer periphery 210 of the fabric panel 140. In this embodiment, the pocket 212 includes a peripheral gutter or channel extending around the outer periphery 210 of the fabric panel 140, as explained below. The fabric strip 230 may be a separate element attached to the fabric panel 140. Alternatively, the fabric strip 230 may be formed from the same material defining the fabric panel 140 but turned over as a seam. The fabric strip 230 may include an outer perimeter edge 232 and an inner perimeter edge 234. In such embodiments, the outer perimeter edge 232 may be attached (e.g., stitched) to the fabric panel 140, such as along or adjacent to the outer periphery 210 of the fabric panel 140. The inner perimeter edge 234 may be unattached to define the opening 220 between the inner perimeter edge 234 of the fabric strip 230 and the inner surface 216 of the fabric panel 140. For example, the fabric strip 230 (e.g., the inner perimeter edge 234) may extend a distance inwardly from the outer periphery 210 of the fabric panel 140 to define a perimeter groove 236 in which to receive the frame 178. Alternatively, the perimeter groove 236 may be defined by the fabric sheets 214. As shown in FIG. 7, the perimeter groove 236 (also referred to as a channel) may be defined by a bottom wall 238 and first and second sidewalls 240, 242 extending from the bottom wall 238. The first and second sidewalls 240, 242 may extend from the bottom wall 238 in a spaced apart relationship such that the opening 220 is defined between the first and second sidewalls 240, 242. In this manner, the perimeter groove 236 may be u-shaped to receive the frame 178 therein. In one embodiment, the perimeter groove 236 may be open to the inside or to the center of the luggage article 100. For example, the perimeter groove 236 may be open to the center of the fabric panel 140.

**[0043]** Depending on the particular application, the fabric strip 230 may define the first sidewall 240 of the perimeter groove 236, with the inner surface 216 of the fabric panel 140 defining at least a portion of the opposite second sidewall 242. Additionally or alternatively, the fabric strip 230 may curve around the frame 178 such that the fabric strip 230 defines at least portions of the bottom wall 238 and the first and second sidewalls 240, 242. For instance, as shown in FIG. 7, the second sidewall 242 of the perimeter groove 236 may be defined by portions of the fabric strip 230 and the inner surface 216 of the fabric panel 140 in combination. The bottom wall 238 of the perimeter groove 236 may define the inner periphery 218 of the pocket 212 against which the frame 178 engages and is biased against. To restrain the frame 178 within the perimeter groove 236, the inner perimeter edge 234 of the fabric strip 230 may have a perimeter smaller than the inner periphery 218 of the pocket 212 such that the fabric strip 230 extends a distance inwardly from the inner periphery 218. As such, the frame 178 may be restrained

within the perimeter groove 236 between the inner surface 216 of the fabric panel 140 and the fabric strip 230. The fabric strip 230 may define all of or a portion of both of the sidewalls of the groove 236.

**[0044]** The pocket 212 may be defined in other configurations. For example, the pocket may be defined by a U-shaped divider in the fabric panel 140. In such embodiments, the frame 178 may be held behind the gusset of the U-shaped divider. Though the above embodiments describe the pocket 212 defined between the inner surface 216 of the fabric panel 140 and one or more fabric sheets or strips attached to the outer periphery 210 of the fabric panel 140, the pocket 212 may be a dedicated pocket or void space defined in the fabric panel 140. For example, the pocket 212 may be defined within or between the layers of the lamina defining the fabric panel 140, within a zip pocket defined on the outer surface of the fabric panel 140, or similar.

**[0045]** FIG. 4 is a partial cut-away view of the fabric panel 140 of FIG. 3 and showing the frame 178 positioned within the pocket 212. FIG. 5 is a fragmentary cross-sectional view of FIG. 6 showing the frame 178 within the pocket 212. FIG. 7 is a fragmentary cross-sectional view of the fabric panel 140 of FIG. 6 and showing the frame 178 positioned within an additional pocket 212. Referring to FIGS. 4, 5, and 7, the frame 178 may be unattached to the fabric panel 140, to any other element of the frame structure 170, or to any other element of the luggage article 100 when positioned within the pocket 212. In other words, the frame 178 may not be affixed within the pocket 212 other than by an outwardly biased force against the pocket 212, such as against the inner periphery 218 of the pocket 212, to position the frame 178 relative to the fabric panel 140 as well as to outwardly tension the fabric panel 140. In this manner, the frame 178 may "float" within the pocket 212, wherein "floating" means not fixedly attached to the fabric panel 140 or to any other element of the luggage article, whether tensioned against the inner periphery 218 or not.

**[0046]** Referring to FIG. 5, to position the frame 178 within the pocket 212, at least a portion of the frame 178 may be inserted within the opening 220 (such as within the perimeter groove 236 or between the two or more fabric sheets 214) until the frame 178 at least partially abuts against at least a portion of the inner periphery 218 of the pocket 212. The remaining portion of the frame 178 may then be positioned against the inner periphery 218 of the pocket 212. For example, one of the fabric sheets 214 or portions of the fabric strip 230 may be pulled or otherwise positioned over the frame 178 such that the entirety of the frame 178 is positioned within the pocket 212 and against the inner periphery 218 of the pocket 212. More specifically, an upper fabric sheet 214 may be bent and pulled over the frame 178. In some embodiments, resilient deformation of the frame 178 (e.g., slight bending, twisting, etc.) may be required to position the frame 178 within the pocket 212. The frame 178 may be biased against the pocket 212 to limit relative

movement therebetween, such as via outward tension of the frame 178 against the inner periphery 218 of the pocket 212. Once positioned within the pocket 212, the frame 178 may maintain a shape of the fabric panel 140, such as to limit folding, collapsing, or other similar deformation of the fabric panel 140.

**[0047]** The luggage article 100 (e.g., the housing 102, the fabric panel 140, etc.) and/or the frame structure 170 (e.g., the frame 178) may be formed from a variety of materials and means. For example, the corner connectors 192 may be formed from a thermoplastic material (self-reinforced or fiber reinforced), ABS, polycarbonate, polypropylene, polystyrene, PVC, polyamide, and/or PTFE, among others. In some embodiments, the elongate elements 190 may be extruded from aluminum or other similar metal. In addition, the elongate elements 190 may be formed from fiber reinforced epoxy, resin, or other similar material. The corner connectors 192 as well as other portions of the frame structure 170 (e.g., the top and bottom pan structures 172, 174, etc.) may be formed or molded in any suitable manner, such as by plug molding, blow molding, injection molding, extrusion, casting, or the like. As noted above, the luggage article 100 may be formed from softside material and/or hardside material. The softside material may be nylon, canvas, polyester, leather, PVC, polypropylene, polyethylene, and/or PTFE, among others. The hardside material may be a thermoplastic material (self-reinforced or fiber reinforced), ABS, polycarbonate, polypropylene, polystyrene, PVC, polyamide, and/or PTFE, among others.

**[0048]** All relative and directional references (including: upper, lower, upward, downward, left, right, leftward, rightward, top, bottom, side, above, below, front, middle, back, vertical, horizontal, and so forth) are given by way of example to aid the reader's understanding of the particular embodiments described herein. They should not be read to be requirements or limitations, particularly as to the position, orientation, or use unless specifically set forth in the claims. Connection references (e.g., attached, coupled, connected, joined, and the like) are to be construed broadly and may include intermediate members between a connection of elements and relative movement between elements. As such, connection references do not necessarily infer that two elements are directly connected and in fixed relation to each other, unless specifically set forth in the claims.

**[0049]** Those skilled in the art will appreciate that the presently disclosed embodiments teach by way of example and not by limitation. Therefore, the matter contained in the above description or shown in the accompanying drawings should be interpreted as illustrative and not in a limiting sense. The following claims are intended to cover all generic and specific features described herein, as well as all statements of the scope of the present method and system, which, as a matter of language, might be said to fall there between.



**Claims**

1. A luggage article (100) comprising:
  - a fabric panel (140) having an outer periphery (210) and a pocket (212) having edges defining an inner periphery (218) defined inwardly from the outer periphery (210); and
  - a frame (178) defining a closed loop corresponding at least partially to the outer periphery (210) of the fabric panel (140);
  - wherein the frame (178) is received within the pocket (212) unattached to the fabric panel (140) and outwardly biased against the inner periphery (218) of the pocket (212).
2. The luggage article (100) of claim 1, wherein the pocket (212) defines an opening (220) inwardly from the outer periphery (210) of the fabric panel (140) and through which the frame (178) is received to position the frame (178) within the pocket (212).
3. The luggage article (100) of claim 2, wherein the opening (220) extends around the entirety of the inner periphery (218) of the pocket (212).
4. The luggage article (100) of any preceding claim, wherein the pocket (212) defines a perimeter groove (236) in which to receive the frame (178).
5. The luggage article (100) of any preceding claim, wherein the pocket (212) is defined by a fabric strip (230) extending adjacent the outer periphery (210) of the fabric panel (140), and preferably attached to the outer periphery (210) of the fabric panel (140).
6. The luggage article (100) of claim 5, wherein the fabric strip (230) extends a distance inwardly from the outer periphery (210) of the fabric panel (140) and includes an inner perimeter edge (234) with a perimeter smaller than the outer periphery (210) of the fabric panel (140).
7. The luggage article (100) of any preceding claim, wherein the frame (178) is restrained by the pocket (212) to outwardly tension the fabric panel (140).
8. The luggage article (100) of any preceding claim, wherein the frame (178) comprises interconnected elongate elements (190).
9. The luggage article (100) of claim 8, wherein the frame (178) comprises four elongate pulltrusions connected together by corner connectors (192), the elongate pulltrusions at each corner positioned at 90 degrees or greater than 90 degrees to each other.
10. The luggage article (100) of any preceding claim,

wherein the fabric panel (140) comprises a front panel (104) of the luggage article (100).

11. The luggage article (100) of claim 10, wherein:
  - the luggage article (100) includes a base (120);
  - the front panel (104) defines a lid (122) of the luggage article (100); and
  - the front panel (104) is hingedly connected to the base (120).
12. The luggage article (100) of any preceding claim, wherein the frame (178) is removable from the pocket (212) and the fabric panel (140).
13. The luggage article (100) of any preceding claim, wherein the frame (178) and the inner periphery (218) of the pocket (212) are rectangular or square.
14. The luggage article (100) of any preceding claim, wherein the pocket (212) is defined by one or more inner panels (214) with a slot opening (220) through which the frame (178) is received.
15. The luggage article (100) of any preceding claim, further comprising a plurality of panels (104, 112, 114), each panel (104, 112, 114) including a frame (178) within a pocket (212).

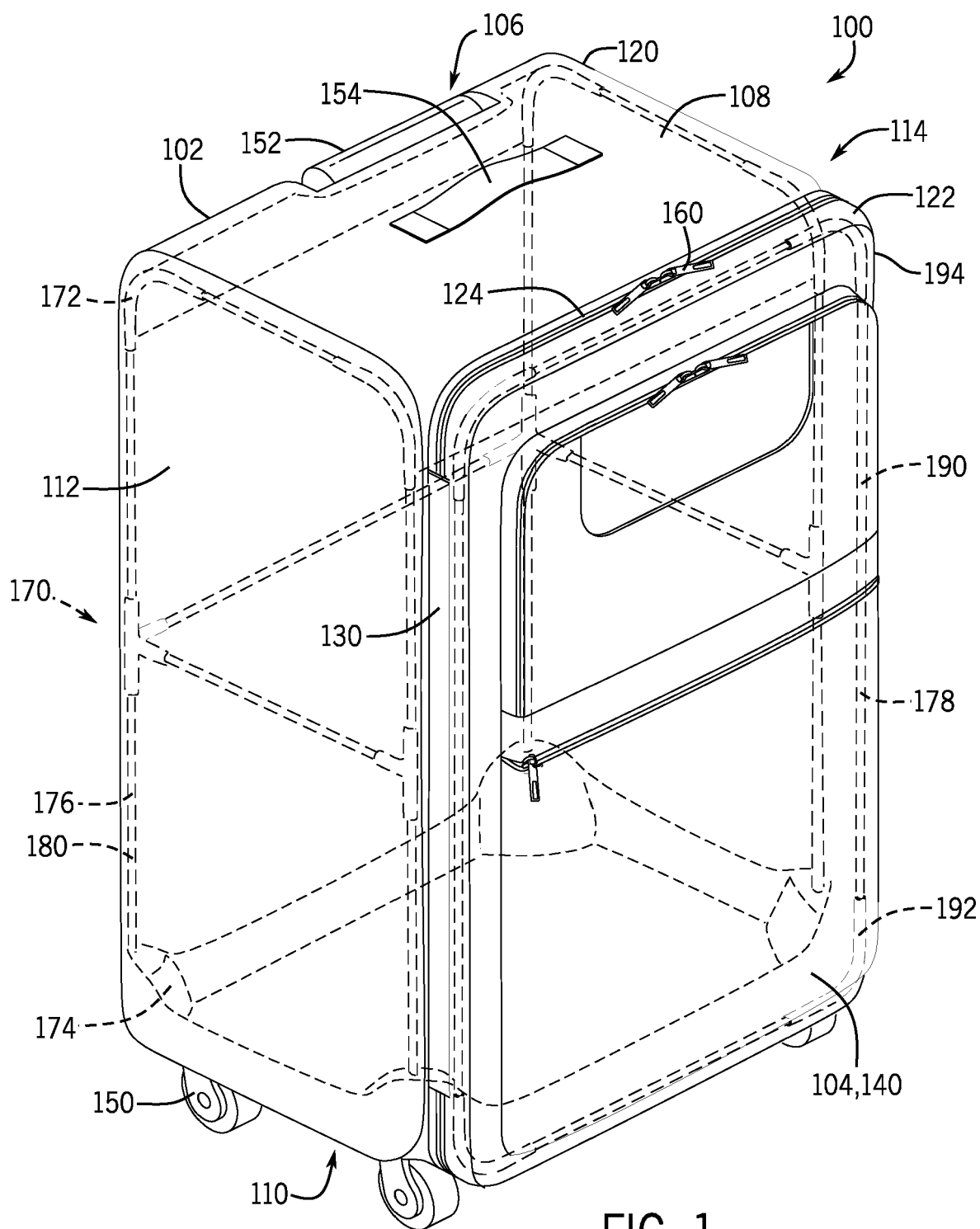
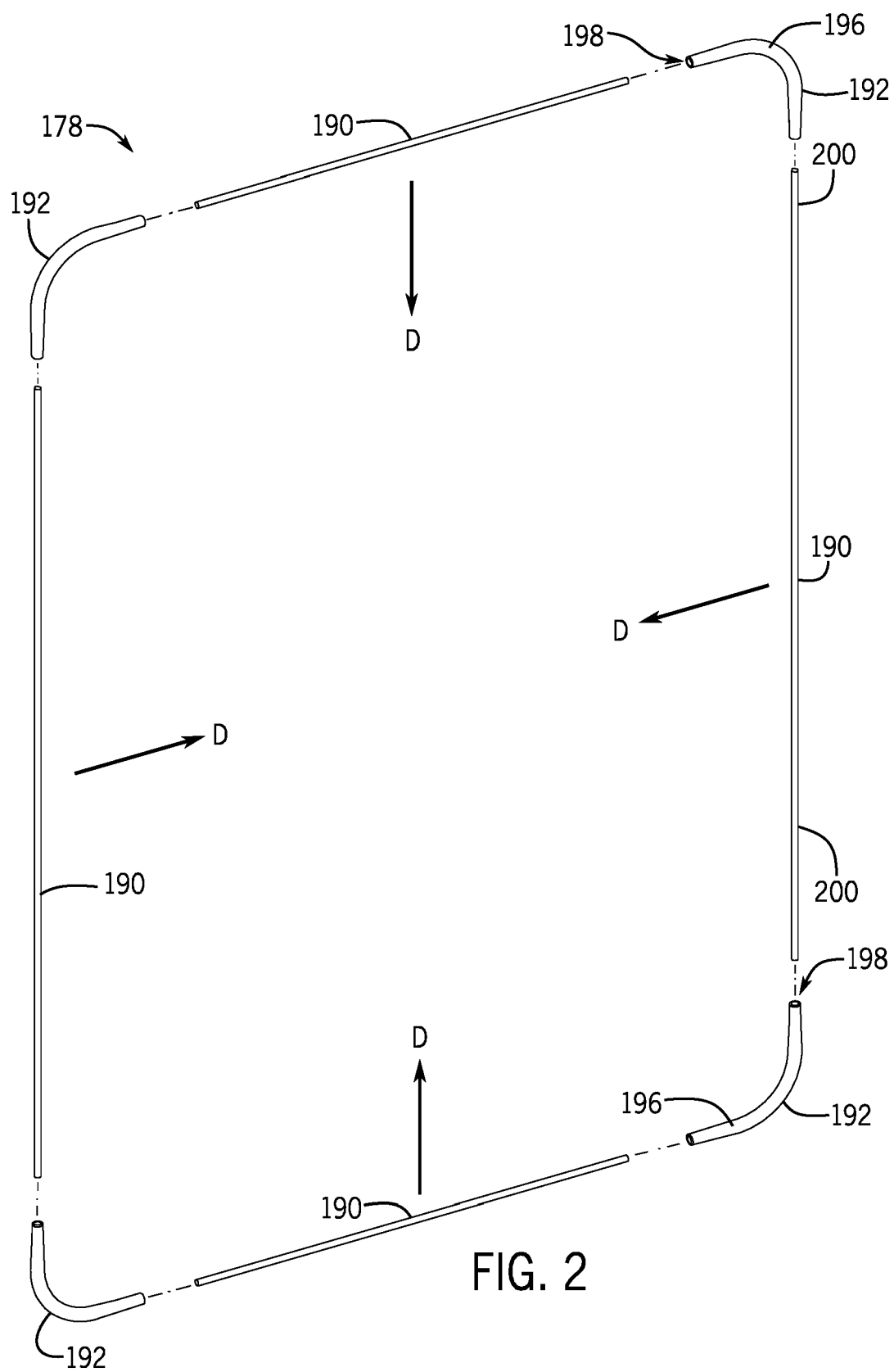


FIG. 1



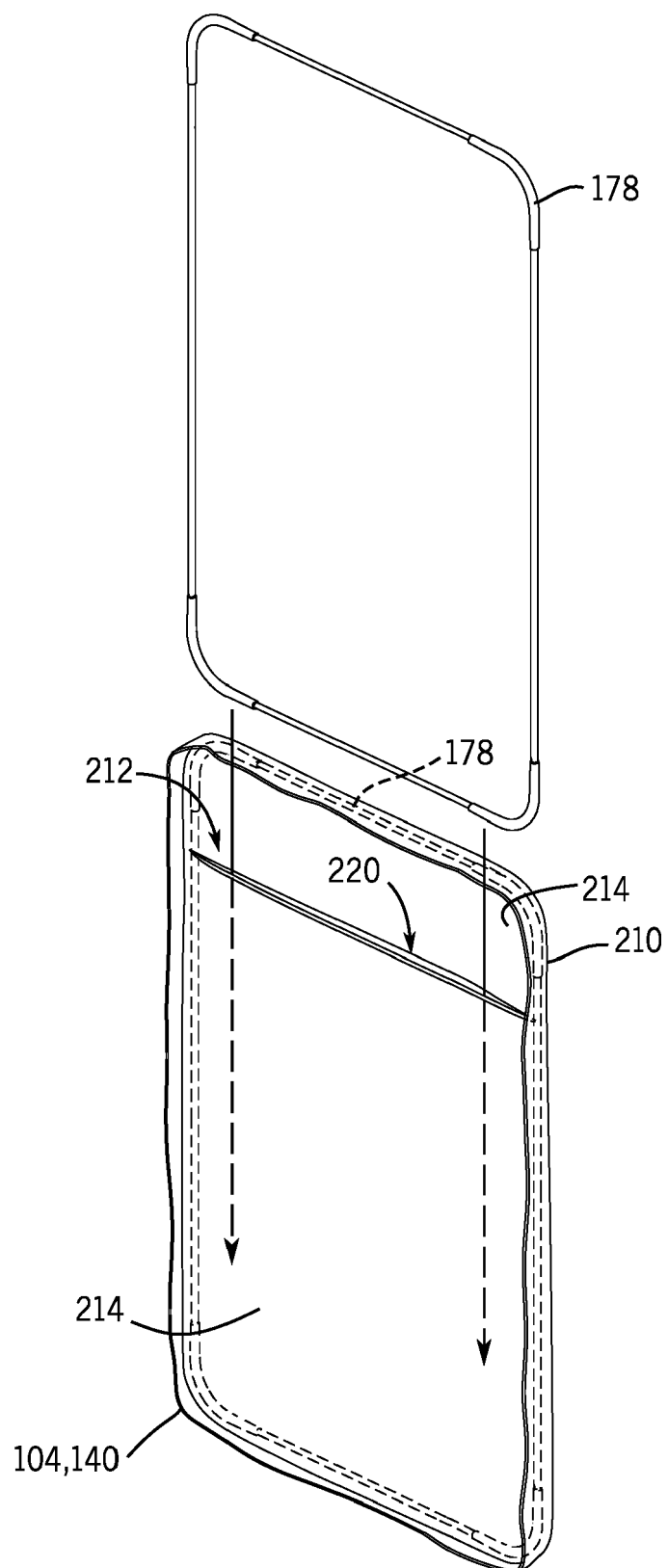


FIG. 3

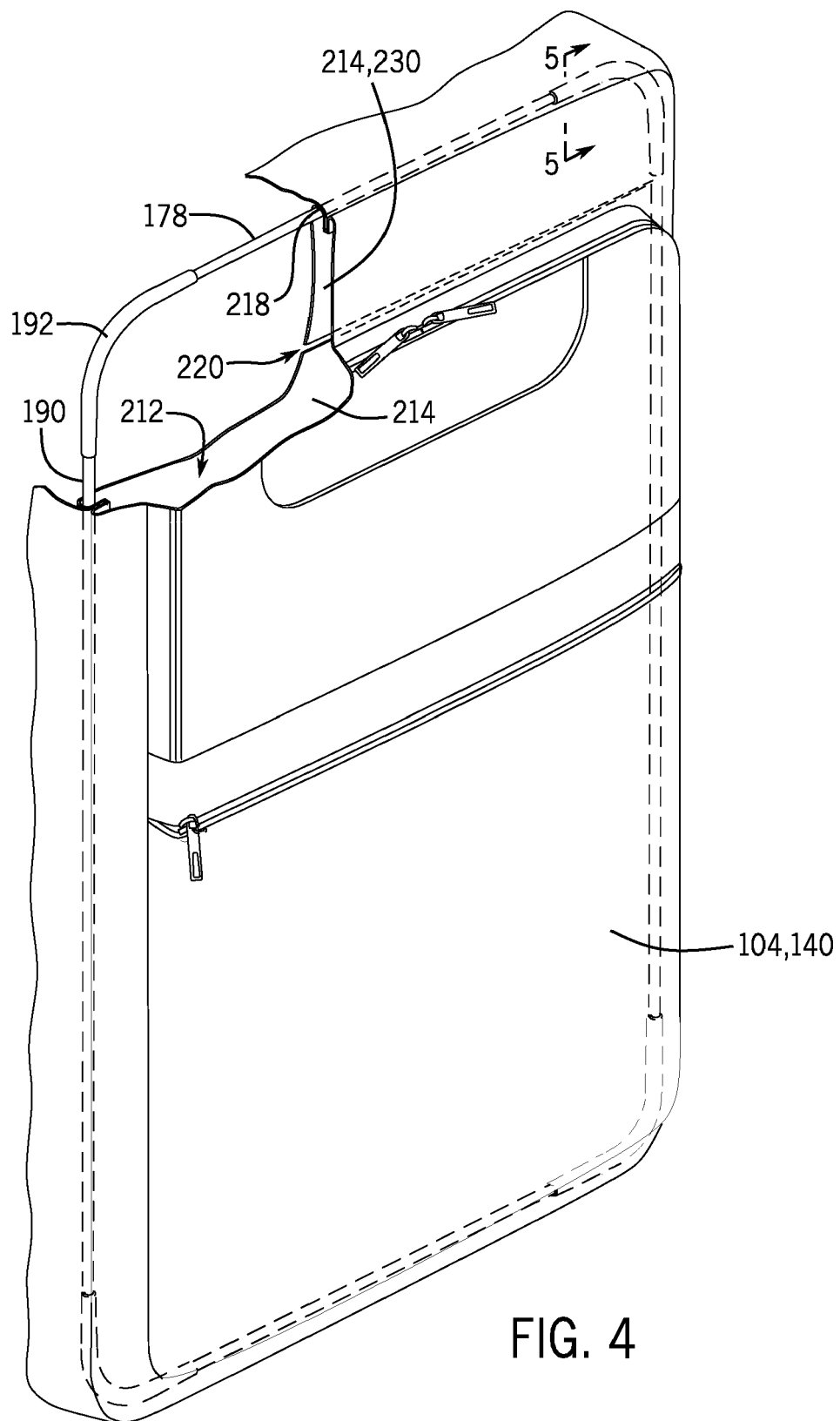


FIG. 4

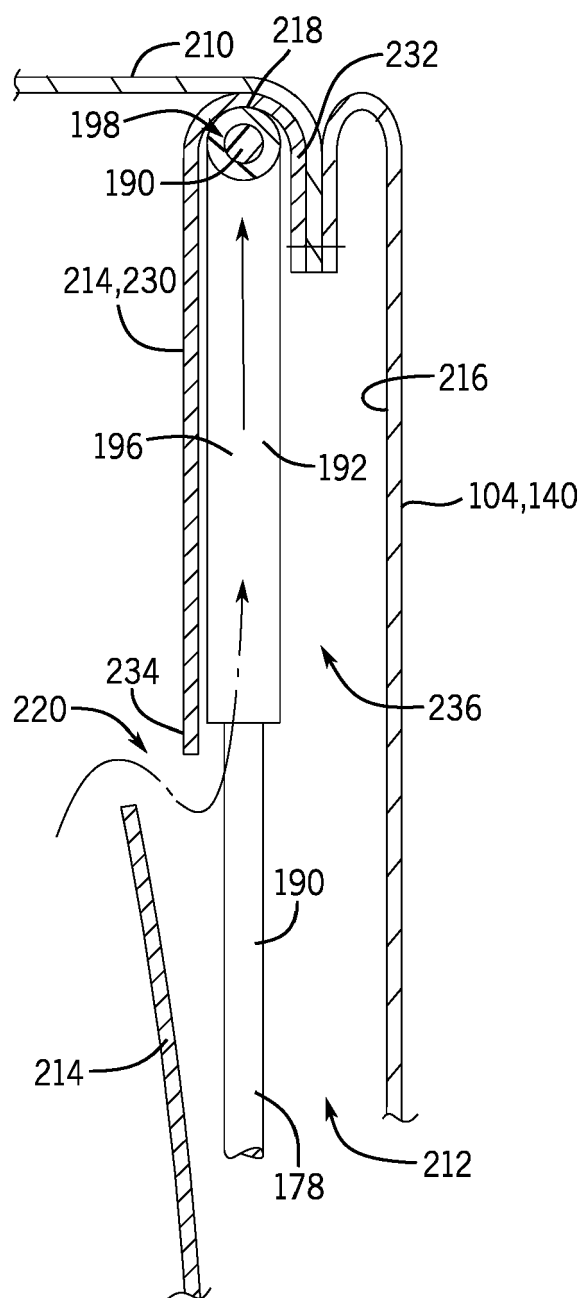
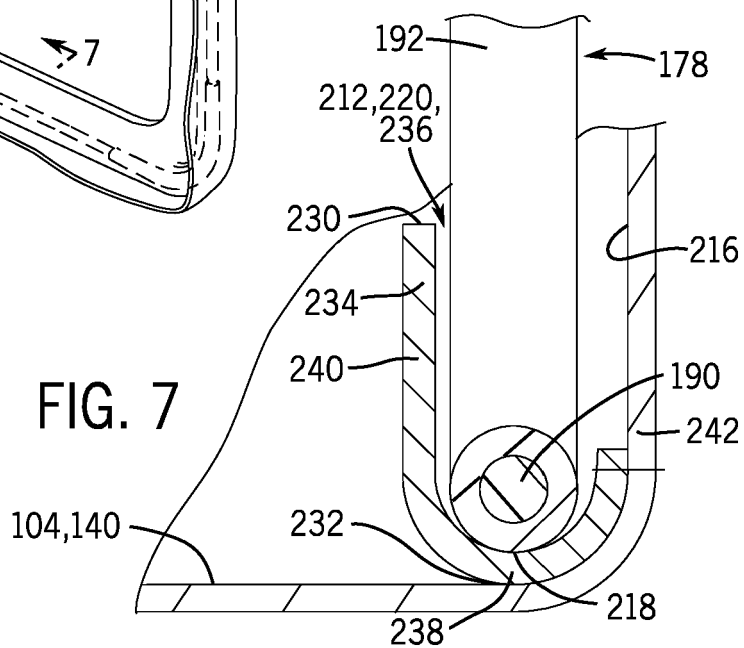
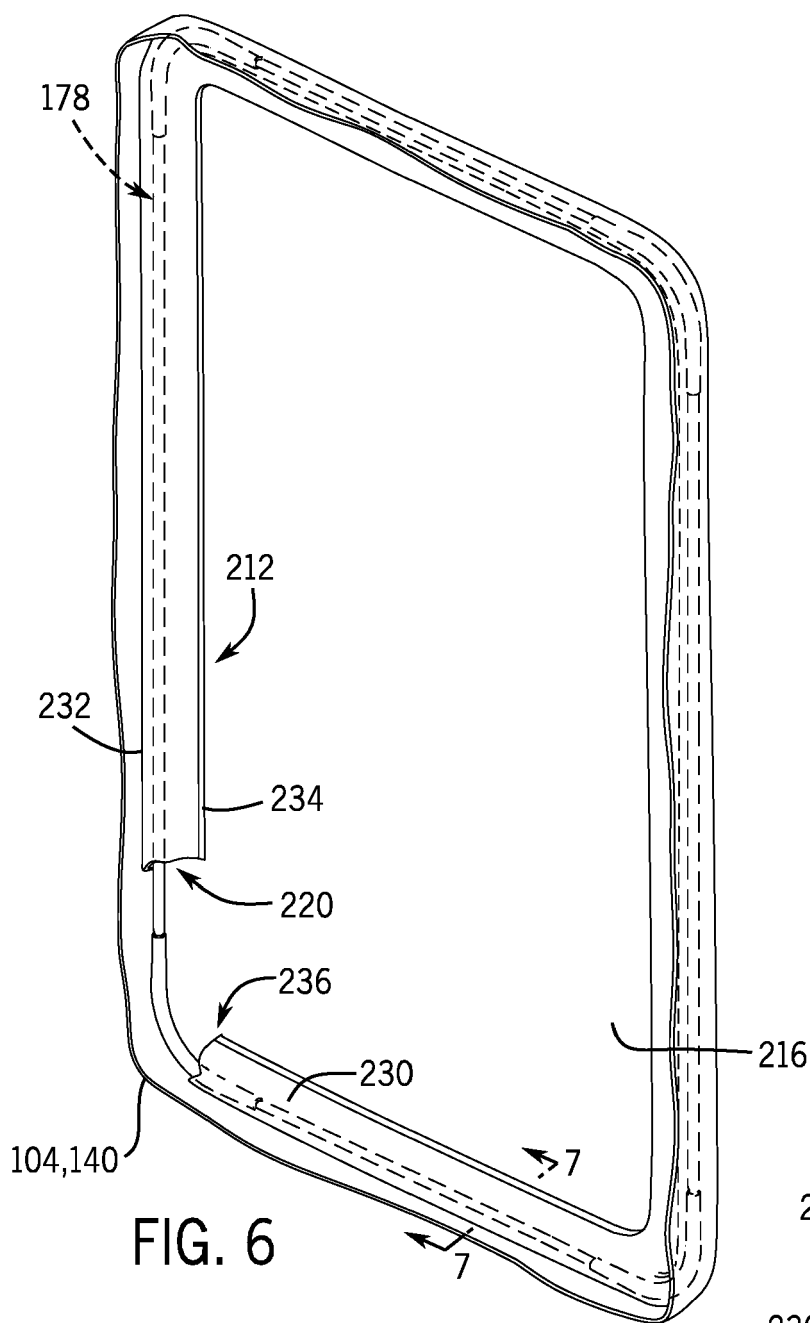


FIG. 5





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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                         |                                                          |                                           |
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| Place of search<br><b>The Hague</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                         | Date of completion of the search<br><b>11 April 2018</b> | Examiner<br><b>Oliveras, Mariana</b>      |
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