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(54) **LUGGAGE CASE WITH A CLOSURE ASSEMBLY**

(57) In one example of the present disclosure, a luggage case (100, 1000) is disclosed. The luggage case (100, 1000) includes at least one shell (118, 120, 1118, 1120) defining a rim (132, 134, 1132), a zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202), an engagement structure (400, 1400) selectively coupling the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) and the shell (118, 120, 1118, 1120), the engagement structure (400, 1400) including an integrally formed track (190, 300, 1300) defining a gap (330, 1330), and a retention feature (216, 1216) selectively received in the gap (330, 1330) and extending from the gap (330, 1330) in a direction transverse to the track (190, 300, 1300), and wherein one of the at least one shell (118, 120, 1118, 1120) or the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) includes the track (190, 300, 1300) and another of the at least one shell (118, 120, 1118, 1120) or the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) includes the retention feature (216, 1216).

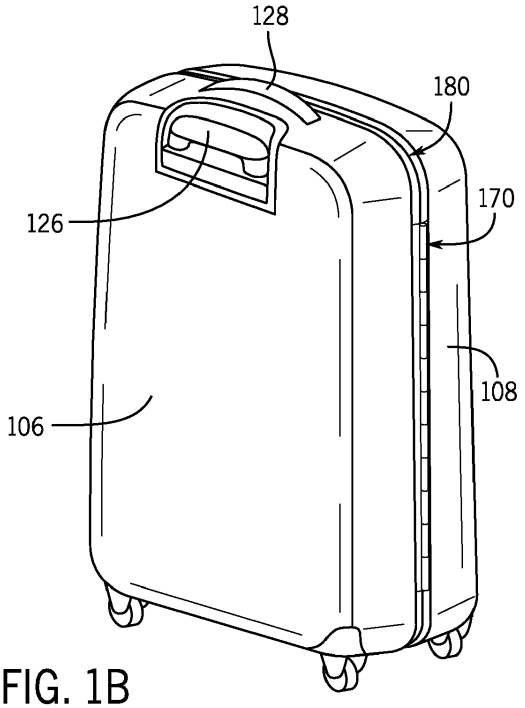

FIG. 1B

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Description

BACKGROUND OF THE INVENTION

[0001] This invention relates generally to a luggage case having a closure assembly, and more specifically to mounting and attaching a closure assembly to a luggage case.

[0002] Existing luggage cases commonly include a zipper or other closure assembly to selectively connect two shells of the case. To attach the closure assembly to the shells commonly requires a skilled person to properly align the closure assembly and the shell and manually attach the closure assembly to the shell, such as by stitching. As a result, attaching closure assemblies to luggage cases is often a time and cost intensive aspect of manufacturing luggage cases.

[0003] Accordingly, there is a need for a more cost effective solution for attaching a closure assembly to a luggage case.

BRIEF SUMMARY OF THE INVENTION

[0004] In one example of the present disclosure, a luggage case is disclosed. The luggage case includes at least one shell defining a rim, a zipper strip, an engagement structure selectively coupling the zipper strip and the shell, the engagement structure including an integrally formed track defining a gap, and a retention feature selectively received in the gap and extending from the gap in a direction transverse to the track, and wherein one of the shell or the zipper strip includes the integrally formed track and another of the shell or the zipper strip includes the retention feature.

[0005] In some examples of the luggage case, the selective coupling of the track and retention feature assists in aligning the closure assembly and shell during assembly.

[0006] In some examples of the luggage case, closure assembly is selectively removable from the shell.

[0007] In some examples of the luggage case, the shell includes the retention feature, the retention feature integrally formed along a portion of the rim and the zipper strip includes the integrally formed track along a portion of an edge of the zipper strip, wherein the track defines the gap to receive the retention feature.

[0008] In some examples of the luggage case, a portion of the shell is internally received by the zipper strip.

[0009] In some examples of the luggage case, the shell includes the integrally formed track, the integrally formed track extending along a portion of the rim of the shell and the zipper strip includes the retention feature, the retention feature extending along a portion of an edge of the zipper strip.

[0010] In some examples of the luggage case, the shell is injection molded.

[0011] In some examples of the luggage case, the shell is injection molded and the track is integrally molded to the shell.

[0012] In some examples of the luggage case, a portion of the zipper strip is internally received by the shell.

[0013] In some examples of the luggage case, the retention feature is slidably received by the track.

[0014] In some examples of the luggage case, the track includes a first flange extending from the shell, a second flange extending from the shell and spaced apart from the first flange to form the gap.

[0015] In some examples of the luggage case, the first flange is continuous or discontinuous.

[0016] Discontinuous may mean the first flange includes separately defined and spaced-apart portions, or the first flange extends at a varying distance from the shell.

[0017] In some examples of the luggage case, the second flange is continuous or discontinuous.

[0018] Discontinuous may mean the second flange includes separately defined and spaced apart portions, or the second flange extends at a varying distance from the shell.

[0019] In some examples of the luggage case, the first flange and the second flange are discontinuous and a number of the first flange and the second flange define leading edges to direct the zipper strip along the track.

[0020] In some examples of the luggage case, the leading edges direct an inserted retention feature to the gap. Accordingly, the curved edges may assist in coupling the track and retention feature.

[0021] In some examples of the luggage case, the first and second flanges are positioned around a corner region. Additionally or independently the first and second flanges are offset from one another.

[0022] In some examples of the luggage case, the retention feature includes a lobe along a portion of an edge of the zipper strip, the lobe having a width dimension greater than the width of the gap, a neck adjacent the lobe, and the gap receives the neck with the lobe engaging an inner surface of the first flange or the second flange to retain the zipper strip in the track.

[0023] In some examples of the luggage case, the lobe having a greater width dimension than the gap prevents the lobe from removal in a direction transverse to the track.

[0024] In some examples of the luggage case, the lobe extends along opposite sides of the zipper strip.

[0025] In some examples of the luggage case, the lobe extends outwardly from opposite sides of the zipper strip to form a T-shape, the lope extending along at least a portion of the length of the zipper strip.

[0026] In some examples of the luggage case, wherein the lobe is continuous or is discontinuous.

[0027] Discontinuous may mean the lobe includes separately defined and spaced apart portions, or the lobe extends at a varying thickness along the edge.

[0028] In some examples of the luggage case, the retention feature includes a rib extending along a portion of a length of the zipper strip spaced from the lobe by the

neck, the neck positioned between the rib and the lobe, and the rib having a width dimension greater than the width dimension of the gap, and the gap receives the neck with the rib on an outer side of the track.

[0029] In some examples of the luggage case, the rib having a greater width dimension than the gap positions the lobe at a desired depth in the track.

[0030] In some examples of the luggage case, the rib forms a "T" shape. Additionally, the rib extends outwardly from an internal facing side, or an external facing side of the zipper strip. Additionally or alternatively, the rib extends outwardly from the zipper strip.

[0031] In some examples of the luggage case, the rib is symmetrical or an in others the rib is not symmetrical.

[0032] In some examples of the luggage case, the rib is continuous or discontinuous.

[0033] Discontinuous may mean the rib includes separately defined and spaced apart portions, or the rib extends at a varying thickness along the edge.

[0034] In some examples of the luggage case, the track includes at least one brace member extending between the shell and the second flange.

[0035] In some examples of the luggage case, the second flange is supported by at least one brace member extending from the shell and defining a cutout to receive the lobe of the zipper strip.

[0036] In some examples of the luggage case, the at least one brace member extends in a direction orthogonal to the shell.

[0037] In some examples of the luggage case, the brace member defines a connection between the shell and the second flange.

[0038] In some examples of the luggage case, the at least one brace member has a thin finlike shape.

[0039] In some examples of the luggage case, a guide flange (1327) is formed on a portion of the at least one brace member defining the cutout.

[0040] In some examples of the luggage case, the shell includes a bearing flange extending from the shell and spaced from the track and the at least one brace member extends between the flange and the bearing flange.

[0041] In some examples of the luggage case, the bearing flange defines a connection between the shell and the second flange.

[0042] In some examples of the luggage case, the at least one brace member is spaced from the first flange and second flange adjacent the gap to define a cutout to accommodate the lobe in the track.

[0043] In some examples of the luggage case, the track includes a plurality of brace members positioned at discrete locations along the rim.

[0044] In some examples of the luggage case, the track includes a plurality of brace members including the at least one brace member, and the plurality of brace members are positioned at discrete locations along the rim.

[0045] In some examples of the luggage case, the cutout in each of the plurality of brace members are at least partially aligned form a channel to accommodate the retention features.

[0046] In some examples of the luggage case, the track includes a plurality of brace members including the at least one brace member, the plurality of brace members including a plurality of cutouts including the cutout and the plurality cutouts of each of plurality of brace members at least partially align to form a channel to accommodate the retention features.

[0047] In some examples of the luggage case, the luggage case further includes two or more shells including the at least one shell and a hinge coupling the two or more shells.

[0048] In some examples of the luggage case, the at least one shell including a first shell and a second shell and the luggage case includes a hinge coupling the first shell and the second shell.

[0049] In some examples of the luggage case, the hinge includes integrally moulded bosses formed along respective sides of the first and second shells to interlace together, each of the bosses defining apertures, and a rod extending through the apertures to form a hinge-pin.

[0050] In some examples of the luggage case, the hinge is attached to the first and second shells at a discrete position.

[0051] In some examples, the hinge includes at least two discrete hinges, at least one of said hinges attached to the first and second shells and to respective ends of the zipper strip.

[0052] In some examples, an anchor couples at least one of the respective ends of the zipper strip to the at least one shell. In one example, the at least one shell defines the anchor.

[0053] In some examples of the luggage case, the hinge includes an outward extending elongated feature defining an anchor, and an end of the zipper strip couples to the anchor to secure the zipper strip in a position relative to the shell. In some examples, the anchor is received in an aperture defined by at least one of the respective ends of the zipper strip to the at least one shell.

[0054] In some examples of the luggage case, the at least one hinge includes a main body having a flexible middle portion attached at one end to the first shell and at another end to the second shell to allow pivoting movement between the first and second shells.

[0055] In some examples of the luggage case, the anchor extends through the shell and end of the zipper strip.

[0056] In some examples of the luggage case, the hinge includes an anchor defined by a shaft extending from the main body, and the anchor couples an end of the zipper strip to the shell.

[0057] In some examples of the luggage case, the hinge is removable.

[0058] In some examples of the luggage case, the hinge is fixed to one of the two or more shells and the anchor is coupled with the other of the two shells.

[0059] In some examples of the luggage case, the retention feature is continuous or discontinuous.

[0060] In some examples of the luggage case, the track is continuous or discontinuous.

[0061] In some examples of the luggage case, the track includes an access region to selectively insert an end of the retention feature of the zipper strip into the track to mount the zipper strip to the respective luggage shell.

[0062] In some examples of the luggage case, the access region includes an opening in the shell to access the track from the exterior of the shell.

[0063] In some examples of the luggage case, the access region includes an opening in the track from an interior of the shell.

[0064] In some examples of the luggage case, the access region is defined between two spaced portions of the track.

[0065] In one example, a luggage case is disclosed. The luggage case includes at least one shell defining a rim, a zipper strip, and an engagement structure selectively coupling the zipper strip and the at least one shell. The engagement structure includes a track defining a gap, and a retention feature selectively received in the gap and extending from the gap in a direction transverse to the track. One of the at least one shell or the zipper strip includes the track, and another of the at least one shell or the zipper strip includes the retention feature.

[0066] In some examples, the track is attached to the at least one shell.

[0067] In some examples, the track is integrally formed with the at least one shell.

[0068] In some examples, the retention feature is integrally formed with the shell.

[0069] In some examples, the retention features are attached to the shell.

[0070] In some examples, the track is attached to the zipper strip

[0071] In some examples, the track is integrally formed with the zipper strip.

[0072] In some examples, the retention feature is integrally formed with the zipper strip.

[0073] In some examples, the retention features are integrally formed with the zipper strip.

BRIEF DESCRIPTION OF THE DRAWINGS

[0074]

FIG. 1A shows front-right perspective view of an example upright luggage case.

FIG. 1B shows a rear-left perspective view of the luggage case of FIG. 1A including an example hinge.

FIG. 2 shows an example closure assembly partially installed an example track along a periphery of a shell.

FIG. 3A shows a perspective view of an example closure or closure assembly.

FIG. 3B shows an end view of the example closure or closure assembly of FIG. 3A.

FIG. 4A shows a partial cross-section view of an example track on an interior of a shell.

FIG. 4B shows a plan cross-section view of the track of FIG. 4A.

FIG. 5A shows a cross section view of the example closure assembly of FIG. 3A retained by corresponding examples tracks of FIG. 4A.

FIG. 5B shows an enlarged view of FIG. 5A as called out by line 5B-5B.

FIG. 6 shows an example closure assembly, similar to Fig. 3B, including an expansion assembly.

FIG. 7 shows a view of example luggage case with discrete hinges.

FIG. 8A shows a luggage shell with a track, and with a zipper strip being inserted into the track.

FIG. 8B shows an enlarged view of a portion of the track of FIG. 8A.

FIG. 9A shows a view of an example track and access region of the shell.

FIG. 9B shows a view of an example track and access region of the shell with an inserted zipper tape.

FIG. 9C shows a of an example track and access region of the shell with a zipper tape secured by the hinge.

FIG. 9D shows a view of an example track and access region of the shell with a zipper tape and hinge secured by a fastener.

FIG. 9E shows a cross sectional view of the track and shell of FIG. 9A.

FIG. 10 shows a view of an example of a zipper tape secured to a track and by an anchor of the shell.

FIG. 11 shows a view of an example of a corner region of the track and shell.

DETAILED DESCRIPTION OF THE INVENTION

[0075] The present application may discloses a luggage case with a track to engage a closure assembly. The luggage case may include a main body with two or more shells hingedly attached. Each shell may define a track extending along at least a portion of the periphery of each shell. A closure assembly may attach to the periphery of each shell, and allow for selective access to the internal volume of the luggage case. The closure assembly may be removably attached to the track on each shell. The closure assembly may include two zipper strips, each zipper strip including zipper teeth on a first edge and a retention feature on a second edge. The zipper teeth on each zipper strip may mate to join the zipper strips together to form the closure assembly. The retention feature of each zipper strip may be attachable to, or removable from, the respective track on each shell. As a result, the closure assembly may be easily installed on or removed from each shell. In some examples, the shell may include the retention feature and each zipper strip may include a track. Additionally, the closure assembly may be removed from the shells and replaced when damaged, rather than replacing the luggage case as a

whole. Each shell, or two or more shells together, may define an access region or access opening for attaching or removing the closure assembly, or one or both of the zipper strips, to or from the track or tracks. For example, the access region may be positioned near an end of the track.

[0076] In some examples, the shells may be coupled together by a hinge portion. For example, the hinge portion may include a plurality of integrally moulded bosses formed along a portion of the periphery of the shells. The bosses on each luggage shell may inter-engage together to receive a hinge pin to form a hinge structure and pivotally connect the shells together. In other example, the hinge portions may be discrete features coupled to or located along a portion of the periphery of the shells. The discretely positioned hinge portions may assist in securing the zipper strip to the shell or track. Inter-engaging bosses in one example may be referred to herein as and include interlaced or interlacing bosses.

[0077] FIG. 1A shows a front-right isometric view of an example luggage case 100 in a closed configuration. FIG. 1B shows a rear-left isometric view of the example luggage case 100. The luggage case 100 may be alternatively referred to as a luggage article, bag, trolley, etc. In one example, the luggage case 100 may be an upright hard-sided case, such as a spinner luggage case. In other examples, the luggage article 100 may be many types of luggage, including a soft side spinner case with a moulded frame or internal shell, a hybrid spinner case, a container, or the like. The luggage case 100 may have a main body 102 with a plurality of panels defining an internal storage volume to carry a user's belongings.

[0078] The luggage case 100 may include a front panel 104 and an opposing rear panel 106, top panel 112 and bottom panel 114, and opposing left panels 108 and right panels 110. Each of the panels may have an exterior surface 138 and an interior surface 136, the interior surfaces 136 together defining the internal storage volume 130. The luggage case 100 can be moved between a closed configuration in which the rim or periphery 134 of the two or more shells 118, 120 of the main body 102 are positioned adjacent one another, and an open configuration to provide access to the internal storage volume 130. The luggage case 100 may be selectively opened or closed by a closure assembly 180. The closure assembly 180 may define a line of connection 122 between the two or more shells 118, 120. The two or more shells 118, 120 may include a first shell 118, which may be referred to as a top shell or a lid, and a second shell 120, which may be referred to as a bottom shell or base shell. Reference may be made to either the first shell 118 or the second shell 120, but it is appreciated that either shell may include the same or similar structures of features.

[0079] The shells 118, 120 may be joined by a hinge 170 along one of the panels, for example the left panels 108. In one example, portions of the hinge 170 may be integrally formed with the shells 118, 120. In some examples, the hinge 170 may be separately formed and attached to or integrated with the shells 118, 120. Each of the shells 118, 120 may be made entirely or partially of an injection moulded polymer. Each shell 118, 120 may be formed as a single unit with at least some features of the shells described herein formed by injection moulding. For example, hard-sided luggage case 100, such as that shown in Figs. 1-6 may be formed at least partially by an injection moulding process. A soft-sided luggage case 100 may be made by injection moulding all or part of a peripheral portion of each shell 118, 120 and connecting soft-sided exterior portions and desired frame members thereto. Exterior or additional features may be connected to the moulded portions of the luggage case 100.

[0080] In some examples, the luggage article 100 may include one or more carry handles 128 and/or a retractable tow handle 126 extendable from a bezel or recess of the rear panel 106 of the luggage article 100. The retractable tow handle 126 may extend outwardly from and retract into the bezel and may allow a user to pull or tow the luggage article 100. The luggage article 100 may include one or more foot elements 148 such as wheels, casters, spinner assemblies, posts, or the like to support or enable the movement of the luggage article 100 on a support surface such as a floor, street, sidewalk, or the ground.

[0081] The luggage case 100 may include a hinge 170 located along a panel of the luggage case 100. The hinge 170 of the luggage case 100 may be defined by bosses 172 spaced apart and positioned along a portion of the peripheral rim 132 of each of the shells 118, 120. In one example, the bosses 172 are integrally moulded with the shell 118, 120. When the shells 118, 120 are positioned together, the bosses 172 of each shell 118, 120 interlace together. Each boss 172 includes an aperture 174 formed there through, and when interlaced together the apertures 174 are aligned. The bosses 172 on one shell 118, 120 may be pivotally coupled together with the bosses 172 on the other shell 118, 120 by a rod or pin being positioned through the bosses 172 by being received in the aligned apertures 174 to form a hinge pin. The hinge 170 may be continuous or discontinuous (e.g. defined by a plurality of sub-hinges). Accordingly, the hinge 170 may be secured by a single rod or pin, or a plurality of rods or pins forming a plurality of hinge pins. The rod may be removable and be replaced when damaged, or to pivotally attach different shells 118, 120 together.

[0082] With reference to FIG. 2, each of the shells 118 may define an engagement structure 199 including a track 190 and a closure assembly 180 including a corresponding retention feature. For example, the track 190 may attach the closure assembly 180 to the shells. In one example, the closure assembly 180 is a zipper assembly. The track 190 may be an integrally moulded feature of each shell 118. In some examples, the track 190 may be separately formed and attached to the luggage shell 118, 120 or defined by the closure assembly 180. For example, the track 190 may be a separate feature, or part of a frame, coupled to the luggage shell 118, 120. The track

190 may be formed at or adjacent to a peripheral edge or rim 134 of each shell 118. The track 190 may be continuous or discontinuous. For example, the track 190 may be segmented or positioned along discrete portions of the shell 118 or have varying heights, widths, or thicknesses along a portion of the shell 118. The track 190 may be formed internally to the shell 118, or externally to the shell 118. The closure assembly 180 may be selectively engageable with the track 190 to define an engagement structure 199. In some examples, the closure assembly 180 may be removable from the track 190.

[0083] In some examples, two shells 118, 120 may be aligned and the closure assembly 180 may engage the tracks 190 of both shells 118, 120 during installation. In other examples, the zipper assembly 180 may include a first zipper strip 182A and a second zipper strip 182B. The zipper strips 182A, 182B may define retention features. The retention features of the first zipper strip 182A of the closure assembly 180 may separately engage a first track 190A of the first shell 118 and the second zipper strip 182B of the closure assembly 180 may engage a second track 190B of the second shell 120. After installation, the first zipper strip 182A may then selectively engage with the second zipper strip 182B to form the closure assembly 180. While description is given with respect to the track 190 being defined by the shell 188, in some examples the closure assembly 180 may define the track 190. Similarly, the retention features may be defined by the shells 118, 120. Accordingly, in some examples, the shell 118, 120 may define the retention features and the zipper assembly 180 may define one or more tracks 190 and the track 190 of the closure assembly 180 may receive the retention features of the shell 118 or 120.

[0084] The closure assembly 180 may be received onto the track 190 at a defined location of the track 190, such as at an access region 194 of the track 190. The access region 194 may be, in one example, an opening formed in the shell 118 that allows access to the track 190. In one example, the access region 194 is an example of a discontinuous track 300 and may include the opening in the track formed by ends of the track 300 or the shells 118, 120 spaced apart by a break, such as for instance 3-6 centimeters. The access region 194 may be positioned at or near an end portion of the track 190, such as for example near or adjacent an end of a hinge structure 170. In some examples, the access region 194 may define a beginning or end of the track 190. The access region 194 may be defined by the shell 118 or shells 118, 120. The access region 194 may be an opening defined between two spaced-apart portions of an exterior side of the track 190 or the exterior 138 of the shell 118, 120. For example, the access region 194 may allow the track 190 to be accessible from the exterior 138 of the shell 118 on which the track 190 is formed. In some examples, the access region 194 may be at an interior 136 of the shell. For example, the access region 194 may define an opening formed in the shell 118 or between two interior portions of the track 190 to allow access to the track 190. For example, the access region 194 may be defined between two ends of the track 190 spaced along an interior 136 of the shell 118. The closure assembly 180 may be flexible to follow the path of the track 190 around at least a part of the periphery 134 of the luggage shell 118 or shells 118, 120 while being attached thereto.

[0085] In some examples, the track 190 may slidably engage or receive the closure assembly 180 to define the engagement structure 199. In one example, the track 190 and the closure assembly 180 may allow for more efficient assembly by eliminating the need for additional attachment mechanisms to engage the closure assembly 180 to the shell 118 such as stitching, welding, adhesives, or other additional steps. The track 190 and closure assembly 180 may also reduce the need for skilled personnel to properly align the closure assembly 180 along a portion of the shell 118. In another example, where the closure assembly 190 becomes damaged, or when a user would prefer a closure assembly 180 having different features or aesthetics (e.g. waterproofing, color, texture), the closure assembly 180 may be removed in a similar manner as it was installed, and replaced by a different assembly.

[0086] With reference to FIGS. 3-5B, an example of the closure assembly 200 and track 300 are shown. The closure assembly 200 and the track 300 may have the similar or same features or functions as the closure assembly 180 and track 190 previously described. For example, the closure assembly 200 may define retention features 216. The shells 118, 120 may include a track 300. The closure assembly 200 of this example may be a slide-in or slidably attachable closure assembly 200 received in a track 300 to define an engagement structure 400. For example, the track 300 may internally receive a feature of the closure assembly 200. The track 300 may be spaced from the periphery 134 of the shell 118 and positioned internally to the shell 118. In some examples, each track 300 may define a gap 330, and slidably receive the feature of the closure assembly 200 within the gap 330. As discussed above, in some examples the shell 118, 120 may define or include the integrally formed retention features 216 and the closure assembly 200 may define one or more tracks 300 and the track 300 of the closure assembly 200 may receive the retention features of the shell 118 or 120 to define the engagement structure 400. Accordingly, in some examples, the closure assembly 200 may include a track 300 that internally receives retention features 216 of the shell 118.

[0087] In FIGS. 3A - 3B an example closure assembly 300 is shown. The closure assembly 300 may also be referred to as a slide-in closure assembly 300. The closure assembly 330 may include two zipper strips 202A, 202B selectively engageable along a line of connection 122. Each zipper strip 202 may include inter-engaging features 206 (e.g. zipper teeth or zipper coils) and one or more retention features 216. The inter-engaging features 206 may connect the zipper strips 202A and

202B. The inter-engaging features 206 may extend along at least a portion of the length of the inner edge 232 of the zipper strip 202. The retention features 216 may engage the track 300 or prevent removal of the zipper strip 202 from the track 300. The retention feature 216 may extend along at least a portion of the length of the outer edge 230 of the zipper strip 202. The retention feature 216 may be continuous. For example, the retention feature 216 may extend along a length of a portion of the outer edge 230. In other examples, the retention feature 216 may be segmented or discontinuous. For example, the retention feature 216 may include separate portions spaced along the outer edge 230 or may extend a varying width from the outer edge 230. The retention feature 216 may be defined as or include a lobe 218. An optional retention feature 216 may include a rib 220 extending along at least a part of the length of the zipper strip 202 and spaced away from lobe 218 towards the inner edge 232. The optional rib 220 may be continuous or discontinuous. A neck 222 may be defined by the zipper strip 202 adjacent the lobe 218. Where the optional rib 220 is present, the neck 222 may be defined between the rib 220 and the lobe 218.

[0088] The retention feature 216 of the zipper strip 202 is received in the track 300, as shown in Fig. 5A, with the zipper strip 202 being moved parallel to the direction of the track 300 where the neck 222 passes along the gap 330 formed by the track 300, such as by opposing walls or flanges 306, 308. The lobe 218 may have a width dimension X1. In one example, the width dimension may be between 10 and 15 millimeters. The lobe 218 width dimension X1 may be larger than the gap 330, inhibits or resists the movement of the zipper strip 202, from the track 300. For example, the width dimension X1 prevents the zipper strip 202 from being removed through the gap 330 in a direction 340 towards the inter-engaging feature 206. This lobe structure 218 also allows the zipper strip 202 to be moved, such as by sliding, along the track 300 in the direction of the gap 330. The optional rib 220 may be positioned on the zipper strip 202 at the end of the neck 222 opposite the lobe 218. The rib 220, if present, inhibits or resists the movement of the zipper strip 202, from the track 300, for example from the gap 330, in a direction away from the inter-engaging features 206. This rib structure 220 also allows the zipper strip 202 to be moved, such as by sliding, along the track 300 in the direction of the track 300. The lobe 218 may extend away from one or both sides of the zipper strip 202. The rib 220, where present, may extend away from one or both sides of the zipper strip 202.

[0089] In one example, the zipper strip 202 may include an elongated zipper tape 204 positioned on the extrusion 208 or attached along an outer edge 234 to an inner edge 240 of an extrusion 208. The extrusion 208 may be or define the retention feature 216. In one example, the zipper tape 204 may be formed from a woven material. In one example, the extrusion 208 may be made of a plastic material and formed by, in one example, an extrusion process. The zipper tape 204 may be connected or attached to the extrusion 208 by stitching 212, as may be shown in FIG. 3A and FIG. 3B. In some examples, the zipper tape 204 may be connected or attached to the extrusion 208 during extrusion or molding of the extrusion (e.g. overmolded). The zipper tape 204 may, in some examples may be attached to the extrusion 208 by an adhesive or fasteners. In this example, the inter-engaging features 206 may be located along an inner edge 232 of the zipper tape 204.

[0090] The lobe 218 may extend along an outer edge 230 of the extrusion 208. The optional rib 220 may extend along the extrusion 208 spaced away from the lobe 218 as described above. The neck 222 may be defined by the extrusion 208 adjacent or spaced from the lobe 218. Where the rib 220 is present, the neck 222 may be defined by the extrusion 208 between the lobe 218 and the rib 220. This lobe structure 218 also allows the zipper strip 202 to be moved, such as by sliding, along the track 300 in the direction of the track 300. In this example, the lobe 218 may extend away from one or both sides of the extrusion 208. Where present, the rib 220 may extend away from one or both sides of the extrusion 208. In another example, the zipper strip 202 may be made entirely of zipper tape 204, with the inter-engaging features 206 and retention features 216 (e.g. lobe 218, neck 222, optional rib 220) attached to the zipper tape 204 and positioned in the examples as noted above. In another example, the zipper strip 202 may be made entirely of extrusion 208, with the inter-engaging features 206 and retention features 216 (e.g. lobe 218, neck 222, optional rib 220) attached to the extrusion 208 and positioned in the examples as noted above.

[0091] The inter-engaging features 206, such as zipper teeth 210, may be selectively mated together, such as by a zip slider 224, along the line of a connection 122 to form the closure assembly 200. The closure assembly 200 may be oriented to have an exterior side 250, configured to be visible from an exterior of the luggage case 100, and an interior side 252 configured to face towards the inner volume of the luggage case 100. The zip slider 224 may be positioned on the exterior side 250.

[0092] In one example, each zipper strip 202 may be installed individually onto a track 300 on a respective shell 118, 120 to define corresponding engagement structures 400. In another example, each zipper strip 202 may be removed individually from a respective shell 118, 120. In another example, a replacement zipper strip 202 may be installed individually onto a track 300 on a respective shell 118, 120 to replace a zipper strip 202 that was removed from the respective shell 118, 120. This may allow a user to replace only a portion of the closure assembly 200, or to combine different zipper strips 202 with desired features or to achieve a desired aesthetic (e.g. color, or texture). The closure assembly 200 may also be flexible to assist in removing or installing the closure assembly 200 into a track 300.

[0093] Continuing with Figs. 3A and 3B, the lobe 218 may have a width dimension X1 greater than the sur-

rounding portions of the zipper strip 202. In one example, the width dimension X1 is approximately 10 to 15 millimeters. The width dimension X1 may be greater than width dimension X2 of the neck 222. In one example, the width dimension X2 is approximately 5 to 10 millimeters. In one example, the lobe 218 may have a general T-shape. The lobe 218 may extend towards both or either of the interior 252 and exterior 250 sides. Each directional side of the lobe 218 may be referred to as a first and second lobe, collectively as lobes, or together as a single lobe. The lobe 218 may have an outer surface defining a rounded external profile. The lobe 218 may have an inner surface, which in one example may extend at right angles to the zipper strip 202. In other examples, the lobe may define a variety of geometries or shapes (e.g. rectangular, triangular, etc.). The rib 220 may have a width dimension X3 greater than the surrounding portions of the zipper strip 202. In some examples, the rib 220 may have a width dimension X2 less than that of the width dimension X1 of the lobe 218. In one example, the width dimension X3 is approximately 5 to 15 millimeters. The rib 220 may also have a variety of profiles and shapes.

[0094] Turning to FIG. 4A and 4B, with reference to FIG. 2, a track 300 may be formed on the periphery 134 of a luggage shell 118 is shown. The track 300 may receive and retain the closure assembly 200 as described above. The track 300 may extend along all or part of the periphery 134 of the luggage shell 118, and be positioned on the inside 136 of the rim 132. The track 300, or portions of the track 300, may be continuous. In other examples, the track 300 may be discontinuous. For example, the track 300 may include separately defined and spaced portions, or the track 300 may have varying heights or thickness along portions of the shell 118. The track 300 may be spaced from or adjacent the rim 132. The track 300 may include a first portion 306 and a second portion 308.

[0095] The track 300 may be integrally formed or moulded with the shell 118. For example, the track 300 may formed along an inside 136 of the rim 132 by injection moulding. The track 300 may also act as a structural support or stiffener for the luggage shell 118, such as along the periphery 134. In some examples, the track 300 may be separately formed or attached to the shell 118. For example, the track 300 may be a separate component or part of a frame attached or mounted to the shell 118. For example, the track 300 may be attached to the shell 118 by fasteners such as rivets or screws. The track 300 may be made from a moulded material (e.g. polymers or plastics) or a metal, such as aluminum. In some examples, the track 300 may be attached to the shell 118 by corresponding attachment features, such as apertures defined in the track 300 or shell 118 to receive posts or snap features of the other. In some examples, the track 300 may be attached to the shell 118 by stitching or plastic welding.

[0096] The first portion 306 may define a first wall or flange 306 having an inner surface 310, an outer surface 312, and an end surface 314. The first flange 306 may extend from the inside surface 136 of the shell 118. In one example, the first flange 306 may extend away from the shell 118 at a right angle. The first flange 306 may be continuous or discontinuous.

[0097] The second portion 308 may be positioned adjacent to and aligned with the first portion 306. The second portion 308 may be a second wall or flange 308 having an inner surface 316, an outer surface 318, and an end surface 320. The second flange 308 may extend from the shell 118. For example, the second flange 308 may be coupled to (e.g. indirectly extend from) the shell 118 or extend directly from the shell 118. The second flange 308 may be continuous or discontinuous. The second flange 308 may also include an inner rim 322 extending from the outer surface 320 of the second flange 308.

[0098] A gap 330 may be formed between the first 306 and second portions 308. In one example, the gap 330 is formed between the end surface 314 of the first flange 306 and the end surface 320 of the second flange 308. The gap 330 may be continuous through the track 300. The gap 330 may receive and retain the zipper strip 202. The gap 330 may have a gap width dimension X4. In one example, the gap width dimension X4 may be between 5 and 10 millimeters. The inner rim 322 may assist in aligning a zipper strip 202 within the track 300. The inner rim 322 may also guard a zipper strip 202 from contents within the inner volume of the luggage case 100.

[0099] The second portion 308 may be connected to the shell 118 by one or more brace members 326 extending from the interior surface 136 of the shell 118. The brace member 326 may extend from the shell 118 and support the second flange 308. The brace member 326 may position the second portion 308 from the first portion 306 to define the gap 330. The brace member 326 may be a wall or fin extending from the shell 118. The brace member 326 may be oriented orthogonal or perpendicular to the second flange 308. The brace member 326 may be a relatively thin or elongated member. The brace member 326 may, in one example, engage the inner surface 310 of the first flange 306, and/or the inner surface 136 of the shell 118, and where present may provide some structural support for the first flange 306.

[0100] In the example shown, the track 300 may include a plurality of brace members 326 in a spaced relation along the length of the track 300. The brace members 326 together, and/or each brace member 326 may define a cutout 328 oriented with the track 300. For example, each brace member 326 may define a cutout 328 adjacent and around the gap 330 sized to allow for the lobe 218 of the zipper strip 202 to extend through the gap 330 with the lobe 218 on the inner surface 310, 316 of at least one of the first 306 and second flanges 308, as may be shown in Fig. 5A. The cutout 328 may be shaped to match a shape of a portion of the zipper strip 202. In some examples, the track 300 includes a plurality of brace members 326 with a plurality of cutouts 328 defining a channel 328. The cutouts 328 may be at least partially aligned along a portion of the track 300 to define

a channel 328. In other examples, the brace member 326 may be a relatively wide be continuous feature and extend along at least a portion of the track 300. A cutout 328 may be formed in a wider or continuous brace 326 defining a channel 328 to receive the lobe or lobes 218. Alternatively, the channel 328 may be shaped to have a major dimension that may be larger a width dimension X1 of the zipper strip 202.

[0101] An optional bearing flange 332 may extend from an inner surface 136 of a shell 118. The bearing flange 332 may engage a portion of the brace or braces 326 to provide a support structure. For example, one or more of the brace members 326 may extend between the shell 118 and the bearing flange 332. In some examples, the brace members 326 may extend between the bearing flange 332 and the second flange 308. The bearing flange 332 may extend along at least a portion of the inner surface 136 of the shell 118 as well as along at least a portion of the track 300. The bearing flange 332 may also act as an engagement point for a liner, or other feature, of the luggage case 100 to attach to the shell 118.

[0102] FIG. 5A shows an example of the engagement structures 400 including the closure assembly 200 retained along opposing edges by the track 300 formed on each shell 118, 120 as shown. FIG. 5B is an enlargement of an engagement structure 400 of Fig. 5A, and shows a single zipper strip 202 positioned in the track 300. When positioned in the track 300, the neck 222 may extend through the gap 330, with the lobe 218 positioned on and/or against the inner surface 310, 316 of first flange 306 and the second flange 308. The neck 222 may be configured to engage with or fit in the gap 330 defined between the end surfaces 314, 320 of first flange 306 and second flange 308. The lobe 218 may be received in the channel 328 formed by the braces 326. The zipper strip 202 may be retained in the track 300 because the size of the lobe 218 is larger than the size of the gap 330, and thus the zipper strip 202 may not be pulled out in a direction transverse to the extension of the gap 330, as indicated by arrow 340 in FIGS. 5A and 5B. The lobe 218 width dimension X1 may be less than a width dimension of the channel 328 to allow the lobe 218 to pass through the brace or braces 326, as is described in more detail below. The rounded shape of the lobe 218 may assist in guiding the zipper strip 202 through a length of the track 300 by reducing the engagement of the lobe 218 with the flange(s) 332. In some examples, the lobe 218 may have a variety of different profiles, such as a profile matching a profile of the track 300. In some examples, the neck 222 may have a width dimension greater than the gap 330 and/or the lobe 218 may have a greater width dimension X1 than the channel 328 and the zipper strip 202 may compress to fit within the gap 330 or channel 328, respectively. By compressing the zipper strip 202, the friction fit may limit or reduce play or unwanted movement of the zipper strip 202 relative to the shell or track 300.

[0103] The optional rib 220 may limit movement of the zipper strip 202 relative to the track 300. For example, the rib 220 may prevent or limit the zipper strip 202 from moving orthogonally further through the gap 330 in a direction towards the inner surfaces 310, 316 of the first flange 306 and the second flange 308. As a result, the rib 220 may reduce play or unwanted movement of the zipper strip 202 relative to the track 300, such as for instance in a direction orthogonal to the extension of the track 300. The rib 220 may have a width dimension X3 greater than the gap 330 and contact or engage the outer surfaces 312, 318 of the first flange 306 and/or the second flange 308.

[0104] Thus, the zipper strip 202 may be retained by the track 300 with the rib 220 on an exterior side 312, 318 of the first 306 and second 308 flanges, the lobe 218 received in the channel 328, and the neck 222 positioned within the gap 330. While FIGS. 5A and B show the rib 220 and lobe 218 extending from both sides of the zipper strip 202, in other examples the lobe 218 and/or rib 220 may instead extend only in the interior or exterior directions. Each of the lobe 218 and rib 220 may also extend in opposite directions relative to each other.

[0105] With reference to FIG. 2 and 5A-5B, the closure assembly 200 may be engaged with the track 300 at the access region 194. With the retention features 216 engaged with the tracks 300, the closure assembly 200 may be moved along the tracks 300 on each luggage shell 118 and guided around the periphery 134 of the shells 118, 120. The closure assembly 200 may be sufficiently flexible to allow it to bend as it is slid along the track 300, such as when it passes around corners. In some examples, the two shells 118, 120 may be aligned so that the closure assembly 200 may engage at least part of the tracks 300 of both shells 118, 120 during installation. Alternatively, where the luggage shells 118, 120 are not in a closed configuration and are individually accessible, each zipper strip 202 may be installed individually onto the corresponding track 300 of each respective shell 118, 120. The shells 118, 120 may then be configured with their respective peripheral rims 132 adjacent one another, and the zipper strips 202 may then be engaged with each other to form the closure assembly 200.

[0106] The closure assembly 200 may also be sufficiently stiff to overcome friction during insertion. In the example described, the extrusion 208 of each zipper strip 202 may exhibit the appropriate combination of flexibility and stiffness to facilitate passage along the track 300 as it is slid into place. For example, the extrusion 208 may be made of a material such as an elastomer. In some examples, the extrusion 208 may be a thermoplastic elastomer. The extrusion 208 may have a shore hardness value between A60 and A90. In some examples, the extrusion may define openings or features to facilitate bends or elastic deformation as the zipper tape extends around corner regions of the shells. The closure assembly 200 may extend along all or a part of the length of the tracks 300 on each shell 118, 120. The track 300 on each shell 118, 120 may extend along all or part of the periphery 134 of each luggage shell 118, 120 (e.g. continuous or

discontinuous). The track 300, in one example, may extend along the periphery 134 of each shell 118, 120 from one end of the hinge structure 170 to the opposite end of the hinge structure 170.

[0107] When a zipper strip 202 is placed in the track 300 of each shell, the zipper teeth 210 of each zipper strip 202 may engage each other to combine together and form the closure assembly 200. The closure assembly 200 may retain the first 118 and second shells 120 in the closed configuration.

[0108] As shown in FIG. 5B, in some examples a secondary closure assembly 260 may be included. In one example, the secondary closure assembly 260 may be a liner zipper assembly to attach a liner or additional features along an interior 136 of the shell 118. The secondary closure assembly 260 may include secondary zipper tape 264 selectively engaged with a liner zipper tape 266. The secondary zipper tape 264 may engage with the liner zipper tape along secondary inter-engaging features 262. The secondary zipper tape 264 may be coupled to the zipper tape 204 of the zipper strip 202. For example, the secondary zipper tape 264 may be stitched to the zipper tape 204, such as at the stitched connection 212. The secondary zipper tape 264 may be positioned to the interior of the zipper tape 204. In some examples, the secondary zipper tape 264 may be attached or engaged with the extrusion 208.

[0109] FIG. 6 shows an example of the closure assembly 200 including an expansion assembly 270. The expansion assembly 270 may include an intermediate zipper tape 272 coupled to the zipper tape 204 by the inter-engaging features 206. The intermediate zipper tape 272 may be coupled to the end zipper tape 278 by a selectively actuated expansion mechanism 276. An expansion portion 274 may extend from the intermediate zipper tape 272 to the end zipper tape 278. The expansion portion 274 may allow for the width or distance between the intermediate tape 272 and the end tape 278 to increase when the expansion mechanism 276 is actuated. The expansion portion 274 may prevent access to the internal storage volume 130 when the expansion mechanism 270 is in an open configuration. Accordingly, the expansion assembly 270 may allow a user to increase the width dimension between the retention features 216 of the closure assembly 200. By increasing the width dimension the internal storage volume 130, accessible by the actuation of the pull tab 224, of the luggage case 100 may be increased.

[0110] With respect to FIG. 7, another example of a luggage case 1000 is shown. The luggage case 1000 may include the same or similar features as described above with respect to luggage case 100. The luggage case 1000 may include two or more shells, such as a first or top shell 1118 and a second or bottom shell 1120. The top shell 1118 and the bottom shell 1120 may be selectively coupled by a closure assembly 1200 along a line of connection 1122. It is appreciated that the shells 1118, 1120 may include the similar or same features as shells 118 and 120 described elsewhere herein. The shells 1118, 1120 may be coupled along a side by one or more discrete hinges 800. The hinges 800 may be placed along an exterior surface or side 1138 of the luggage case 1000. The luggage case 1000 may include a retractable tow handle 1126.

[0111] The hinge 800 may include a main body 801 defining a first end 802, a second end 804, and a link or middle portion 806 extending between the first end 802 to the second end 804. Each of the first side 802 and the second side 804 may be rectangular in shape. The middle portion 806 may be extend between or attached to the first side 802 and the second side 804. The middle portion 806 may be a flexible and/or durable material.

[0112] The main body 801 may be attached to the shells 1118, 1120 to define the hinge 800. For example, the main body 801 may be attached at a first end 823 and/or a second end 825 of the shells 1118, 1120. The first side 802 may be attached to the top shell 1118. The second side 804 may be similarly attached to the bottom or second shell 120. The middle portion 806 may flex or bend to allow for the shells 118, 120 to move relative to one another from the open configuration to the closed configuration, as well as the reverse.

[0113] FIGS. 8A shows an example shell 1120 including an engagement structure 1400 including an integrally formed track 1300, and with a zipper strip 1202 of the closure assembly 1200 inserted partially along the track 1300. FIG. 8B shows a close up view of the track 1300, including FIG. 9A-9E show views of the example shell 1120 and track 1300. In various figures, the track 1300 is shown receiving and securing the zipper strip 1202 in the track 1300.

[0114] As shown in FIG. 8A, FIG. 8B, FIG. 9A, and FIG. 9E, the track 1300 may be positioned at or adjacent a periphery or rim 1132 of the shell 1120. In one example, the track 1300 may be positioned on the interior 1136 of the shell 1120. The track 1300 may include a first portion or flange 1306 extending from the shell 1120. The track 1300 may include a second flange or portion 1308 extending from the shell. The first flange 1306 or the second flange 1308 may be coupled to (e.g. indirectly extend from) the shell 1120 or extend directly from the shell 1120. The track 1300 or the first flange 1306 or the second flange 1308 may be continuous or discontinuous. For example, two or more first flanges 1306 or second flanges 1308 may be positioned at discrete positions along the track 1300. The first flange 1306 and second flange 1308 may be positioned adjacent one other, such as in pairs. In some examples, the first flange 1306 and the second flange 1038 may be offset or in a staggered positions along the track 1300. In the discontinuous examples, the first flange 1306 or the second flange 1308 may have varying lengths or other dimensions. For example, one first flange 1306 may extend along a greater portion of the track 1300 than a second first flange 1306.

[0115] The first flange 1306 and the second flange 1308 may be spaced to define a gap 1330 to receive

the zipper strip 1202. The gap 1330 may be defined along a length of a portion of the track 1300 defining a channel 1328.

[0116] The track 1300 may include brace members 1326. The brace members 1326 may extend between the shell 1120 and the second portion 1308. In some examples, the brace members 1326 may attach the second flange 1308 to the shell 1120. The brace members 1326 may define the bottom or depth of the gap 1330. In one example, the brace members 1326 and the first flange 1306 and the second flange 1308 define the channel 1328. A portion of the brace members 1326 may define a guide flange 1327. For example, the top of the brace members 1326 may include or define the supporting or guide flange 1327. The guide flange 1327 may have a width greater than the brace member 1326. For example, the guide flange 1327 may extend along the direction of the channel 1328 or track 1300 relative to the brace member 1326. The supporting flange 1327 may assist in guiding the zipper strip 1202 along the track 1300.

[0117] The track 1300 may include an optional guide feature or inner rim 1322 extending from the second flange 1308. The optional inner rim 1322 may assist in guiding the zipper strip 1202 through the track 1300 or protect the zipper strip 1202 from items stored in the luggage case 1000. The track 1300 may include an optional bearing fin or flange 1332 extending from the shell 1120 and attached or engaged with the brace members 1326. The bearing fin 1332 may extend between the brace members 1326. The bearing fin 1332 may be continuous or discontinuous.

[0118] The track 1300 may define an access region 1194 to allow the zipper strip 1202 to be inserted into the gap 1330. The access region 1194 may be an opening in the track at or adjacent a gap 1330. In one example, the access region 1194 is an example of a discontinuous track 1300 and may include the opening in the track formed by ends of the track 1300 spaced apart by a break, such as for instance 4-6 centimeters. For example, the access region 1194 may be defined between a first end 1350 of the track 1300 and a second end 1352 of the track 1300 spaced along the rim 1132. In one example, the access region 1194 is located on the interior 1136 of the shell 1120. In some examples, as described in greater detail below, the hinge 800 may be attach or connect to the shell 1120 at the access region 1194. The shell 1120 may define access apertures 1196 at the access region 1194 between the interior 1136 and the exterior 1138 of the shell.

[0119] The closure assembly 1200 and the zipper strip 1202 may include the same or similar features and functions as the closure assembly 200 and zipper strip 202, respectively, as previously described. For example, the zipper strip 1202 may include a zipper tape 1204 and an extrusion 1208. The zipper tape 1204 may define include inter-engaging features 1206, such as zipper teeth or zipper coils, along an edge. The extrusion 1208 may include retention features 1216 to selectively engage the track 1300. The retention features 1216 may be spaced from the inter-engaging features 1206. The retention features 1216 may include a lobe or bead 1218 or an otherwise enlarged portion. The retention features 1216 may include a neck 1222 spaced from the lobe 1218. The retention features 1216 may include one or more ribs 1220 adjacent the neck 1222 opposite and spaced from the lobe 1218.

[0120] The zipper strip 1202 may include a first end 1270. The zipper strip 1202 may include a second end 1272 opposite the first end 1270. The zipper strip 1202 may define apertures 1275 at the first end 1270 or the second end 1272. The apertures 1275 may be defined by the zipper tape 1204, the extrusion 1208, or both.

[0121] As shown in FIG. 8A and 9B, the zipper strip 1202 may be inserted into the track 1300 at the access region 1194. For example, the second end 1272 of the strip 1202 may be inserted at the first end 1350 of the track 1300. The retention features 1216 may engage the track 1300. For example, the neck 1222 may be inserted between the first flange 1306 and the second flange 1308, such as in the gap 1330. The lobe 1218 may be placed in the channel 1328. The zipper strip 1202 may move in the insertion direction 1340 until the zipper strip 1202 is fully inserted. For example, when fully inserted the first end 1270 of the zipper strip 1202 may be positioned at or adjacent the first end 1250 of the track 1300. In some examples, the track 1300 may be continuous or discontinuous. The zipper strip 1202 may be continuous or discontinuous. After insertion, the zipper strip 1202 may extend into or align with the access region 1294. For example, the zipper apertures 1275 may align with the access apertures 1196.

[0122] To secure the zipper strip 1202 to or in the track 1300, the hinge 800 may include features to connect to the shell 1120 and the zipper strip 1202. The hinge 800 may include attachment features or an anchor 810. For example, the anchor 810 may be an elongated feature extending from the hinge 800. The anchor 810 may extend from either or both the first side 802 or the second side 804. In one example, the attachment features 810 may include a shaft 813 with an enlarged end 816. The anchor 810 may be inserted through the access apertures 1196 to couple the hinge 800 to the shell 1120. The anchor 810 may be inserted through the zipper aperture 1275 to secure the zipper tape 1202 to the track 1300 or shell 1120. For example, the shaft 813 may be placed within the apertures 1196, 1275 and the enlarged end 816 may extend through the apertures 1196, 1275. The hinge 800 may be attached to either or both of the shells 1180, 1200 before or after installation of the closure assembly 1200 in the track 1300.

[0123] As shown in FIG. 9D, in some examples, a fastener 900 may further secure the hinge 800 or the zipper strip 1202 to the shell 1120. The fastener 900 may be couple to the anchor or attachment features 810 of the hinge 800. The fastener 900 may include apertures 902

to receive the anchors 810 of the hinge 800. The fastener 900 may extend between anchors 810 or ends of the zipper strip 1202. The fastener 900 may be attached to the shells 118, 120 by an additional fastener, adhesive, or additional features.

[0124] With reference to FIG. 10, in some examples the shell 1120 may define the anchors or attachment features 1810. For example, the anchors 1810 may extend from the shell 1120. In one example, the anchors 1810 extend from the inner surface 1136 of the shell 1120. The anchors 1810 may include an enlarged end or portion 1819. The anchors 1810 may extend through the zipper strip apertures 1275. The enlarged end 1819 may be on an interior side of the zipper strip 1202 to secure the zipper strip 1202 in the track 1300.

[0125] FIG. 11 shows an example of the track 1300 near a corner region 1160 of the shell 1120. In some examples, at or adjacent the corner regions 1160 the features of the track 1300 may be arranged to improve guidance of the zipper strip 1202 through the channel 1328. For example, the zipper strip 1202 may be received by the track 1300 in the channel 1328 with the second end 1272 towards the insertion direction 1340.

[0126] With continuing reference to Fig. 11, the first flange 1306 or the second flange 1308 may be continuous. In some examples, the first flange 1036 or the second flange 1308 may be discontinuous, meaning the flanges 1306 or 1308 may be or include a plurality of spaced features or features extending from the shell 1120 a varying distance. In one example, the first flange 1306 and the second flange 1308 may be offset or staggered. The first flange 1306 may include a first leading edge 1366, also depicted in FIG. 8B, on an approaching side relative to the insertion direction 1340. The second flange 1308 may include a second leading edge 1368, also depicted in FIG. 8B, on the approaching side. Either or both leading edges 1366, 1368 may be curved or angled. The brace members 1326 may be angled at the corner region 1160. In one example, the first flange 1306 and the second flange 1308 are discontinuous or segmented to allow the zipper strip 1202 to bend without binding or increasing resistance through the corner region 1160. The leading edges 1366, 1388 may assist in guiding the zipper strip 1202 through or back to the channel 1328 during insertion. For example, as shown in FIG. 11, the curve or angle of the leading edges 1366, 1368 may guide or direct the free end 1272 of the zipper strip 1202 towards the gap 1330 or through the channel 1328.

[0127] The particulars shown herein are by way of example and for purposes of illustrative discussion of the preferred embodiments of the present invention only and are presented in the cause of providing what is believed to be the most useful and readily understood description of the principles and conceptual aspects of various embodiments of the invention. In this regard, no attempt is made to show structural details of the invention in more detail than is necessary for the fundamental understanding of the invention, the description taken with the drawings and/or examples making apparent to those skilled in the art how the several forms of the invention may be embodied in practice.

[0128] As used herein and unless otherwise indicated, the terms "a" and "an" are taken to mean "one", "at least one" or "one or more". Unless otherwise required by context, singular terms used herein shall include pluralities and plural terms shall include the singular.

[0129] Unless the context clearly requires otherwise, throughout the description and the claims, the words 'comprise', 'comprising', and the like are to be construed in an inclusive sense as opposed to an exclusive or exhaustive sense; that is to say, in the sense of "including, but not limited to". Words using the singular or plural number also include the plural and singular number, respectively. Additionally, the words "herein," "above," and "below" and words of similar import, when used in this application, shall refer to this application as a whole and not to any particular portions of the application.

[0130] Of course, it is to be appreciated that any one of the examples, embodiments or processes described herein may be combined with one or more other examples, embodiments and/or processes or be separated and/or performed amongst separate devices or device portions in accordance with the present systems, devices and methods.

[0131] Finally, the above discussion is intended to be merely illustrative of the present system and should not be construed as limiting the appended claims to any particular embodiment or group of embodiments. Thus, while the present system has been described in particular detail with reference to exemplary embodiments, it should also be appreciated that numerous modifications and alternative embodiments may be devised by those having ordinary skill in the art without departing from the broader and intended spirit and scope of the present system as set forth in the claims that follow. Accordingly, the specification and drawings are to be regarded in an illustrative manner and are not intended to limit the scope of the appended claims.

Claims

1. A luggage case (100, 1000) comprising:

at least one shell (118, 120, 1118, 1120) defining a rim (132, 134, 1132);

a zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202);

an engagement structure (400, 1400) selectively coupling the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) and the at least one shell (118, 120, 1118, 1120), the engagement structure (400, 1400) including:

an integrally formed track (190, 300, 1300)

defining a gap (330, 1330), and
a retention feature (216, 1216) selectively received in the gap (330, 1330) and extending from the gap (330, 1330) in a direction transverse to the track (190, 300, 1300); and

wherein:

one of the at least one shell (118, 120, 1118, 1120) or the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) includes the track (190, 300, 1300); and
another of the at least one shell (118, 120, 1118, 1120) or the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) includes the retention feature (216, 1216).

2. The luggage case (100, 1000) of claim 1, wherein:

the retention feature (216, 1216) is integrally formed on a portion of the rim (132, 134, 1132) of the at least one shell (118, 120, 1118, 1120); and
the track (190, 300, 1300) is integrally formed on a portion of an edge (230) of the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202).

3. The luggage case (100, 1000) of claim 1, wherein:

the track (190, 300, 1300) is integrally formed on a portion of the rim (132, 134, 1132) of the at least one shell (118, 120, 1118, 1120); and
the retention feature (216, 1216) is formed on a portion of an edge (230) of the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202).

4. The luggage case (100, 1000) as in any of claims 1 and 3, wherein the track (190, 300, 1300) comprises:

a first flange (306, 1306) extending from the at least one shell (118, 120, 1118, 1120); and
a second flange (308, 1308) extending from the shell (118, 120, 1118, 1120) and spaced apart from the first flange (306, 1306) to form the gap (330, 1330).

5. The luggage case (100, 1000) of claim 4, wherein the first flange (306, 1306) and/or the second flange (308, 1308) is continuous or discontinuous.

6. The luggage case (100, 1000) as in any of claims 1 and 3 to 5, wherein the retention feature (216, 1216) comprises:

a lobe (218, 1218) defined along a portion of an edge (230) of the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202), the lobe (218, 1218) having a width dimension (X1) greater than a width dimension (X4) of the gap (330, 1330);
a neck (222, 1222) adjacent the lobe (218, 1218); and
wherein the gap (330, 1330) receives the neck (222, 1222) with the lobe (218, 1218) engaging an inner surface (310, 316) of the first flange (306, 1306) or the second flange (308, 1308) to retain the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) in the track (190, 300, 1300).

7. The luggage case (100, 1000) of claim 6, wherein:

the retention feature (216, 1216) further comprises:
a rib (220, 1220) extending along a portion of a length of the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) and spaced from the lobe (218, 1218), the neck (222, 1222) defined between the rib (220, 1220) and the lobe (218, 1218); and
wherein the gap (330, 1330) receives the neck (222, 1222).

8. The luggage case (100, 1000) as in any of claims 4 to 7, wherein the second flange (308, 1308) is supported by at least one brace member (326, 1326) extending from the at least one shell (118, 120, 1118, 1120), the brace member (326, 1326) defining a cutout (328, 1328) to receive the lobe (218, 1218) of the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202).

9. The luggage case (100, 1000) of claim 8, wherein the at least one shell (118, 120, 1118, 1120) comprises:

a bearing flange (332, 1332) extending from the at least one shell (118, 120, 1118, 1120) and spaced from the track (190, 300, 1300); and
wherein the at least one brace member (326, 1326) extends between the bearing flange (332, 1332) and the second flange (308, 1308).

10. The luggage case (100, 1000) as in any of claims 8 or 9, wherein:

a width of the cutout (328, 1328) is greater than the width (X4) of the gap (330, 1330); and
the lobe (218, 1218) is received in the cutout (328, 1328) and the neck (222, 1222) is received in the gap (330, 1330).

11. The luggage case (100, 1000) as in any of claims 1 or 3 to 10, further comprising:

the at least one shell (118, 120, 1118, 1120) including a first shell (118, 120, 1118, 1120) and a second shell (118, 120, 1118, 1120); and

a hinge (170, 800) coupling the first shell (118, 120, 1118, 1120) and the second shell (118, 120, 1118, 1120).

12. The luggage case (100, 1000) of claim 11, wherein the hinge (170, 800) includes at least two discrete hinges (800), at least one of said hinges (800) attached to the first shell (118, 120, 1118, 1120) and the second shell (118, 120, 1118, 1120) and to respective ends (1270, 1272) of the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202).

13. The luggage case (100, 1000) of any of claims 3 to 12, wherein:
an anchor (810, 1810) couples at least one of the respective ends (1270, 1272) of the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) to the at least one shell (118, 120, 1118, 1120).

14. The luggage case (100, 1000) as in any of claims 1 or 3 to 13, wherein the track (190, 300, 1300) comprises:
an access region (194, 1194) to selectively insert an end (1270, 1272) of the retention feature (216, 1216) of the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) into the track (190, 300, 1300) to mount the zipper strip (182, 182A, 182B, 202, 202A, 202B, 1202) to the respective shell (118, 120, 1118, 1120).

15. The luggage case (100, 1000) of any of claims 1 to 14, wherein the track (190, 300, 1300) is continuous or discontinuous.

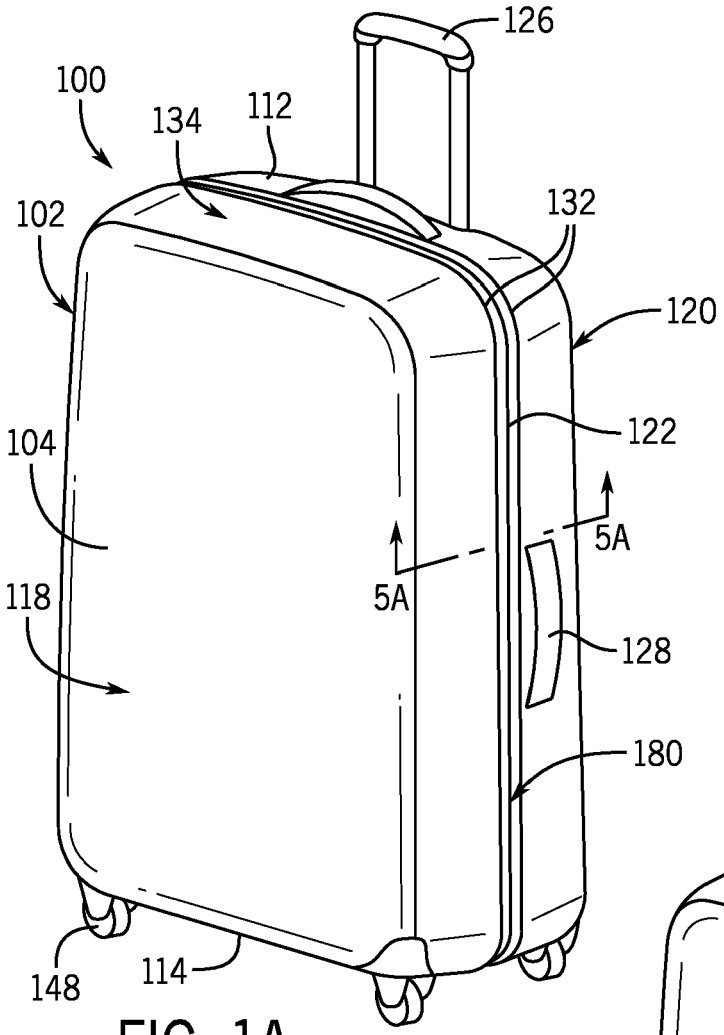

126
100
134
112
102
132
120
122
104
5A
5A
118
128
180
148
114

FIG. 1A

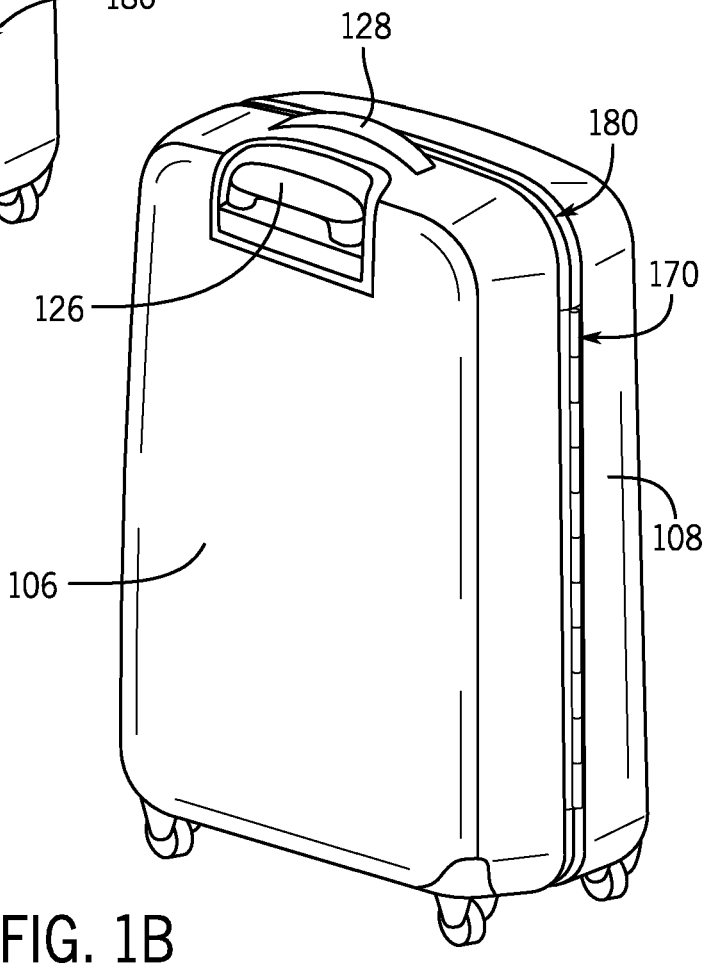

128
180
170
126
108
106

FIG. 1B

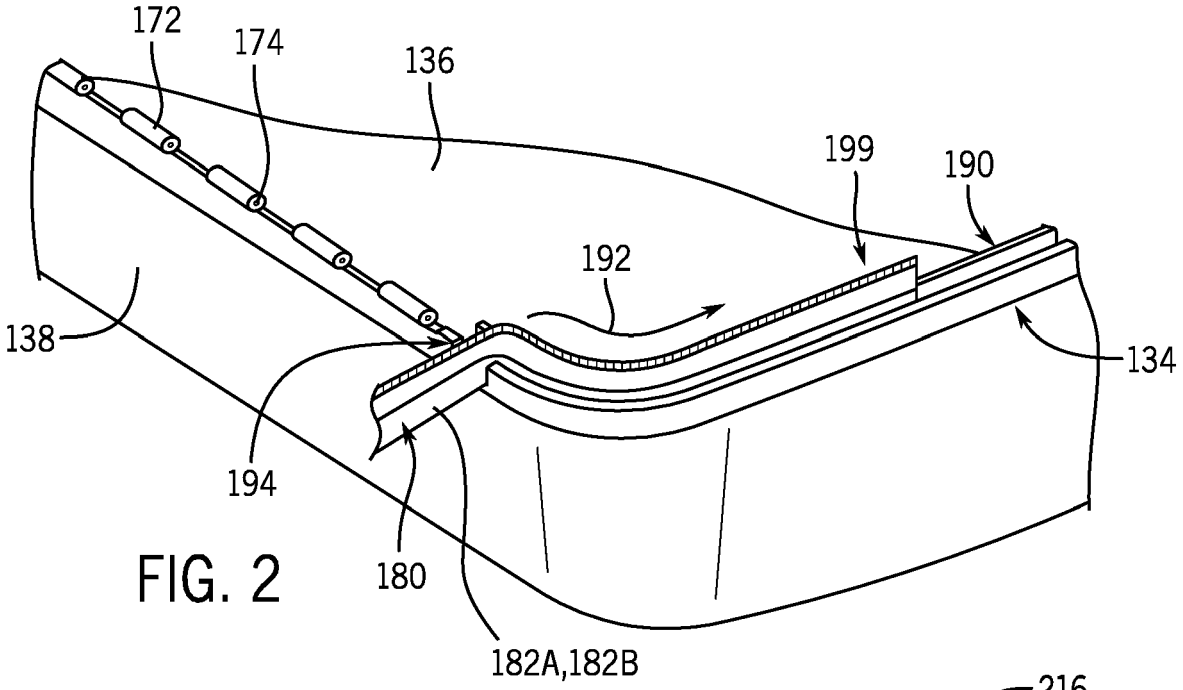

172
174
136
199
190
192
138
134
194
180
182A,182B

FIG. 2

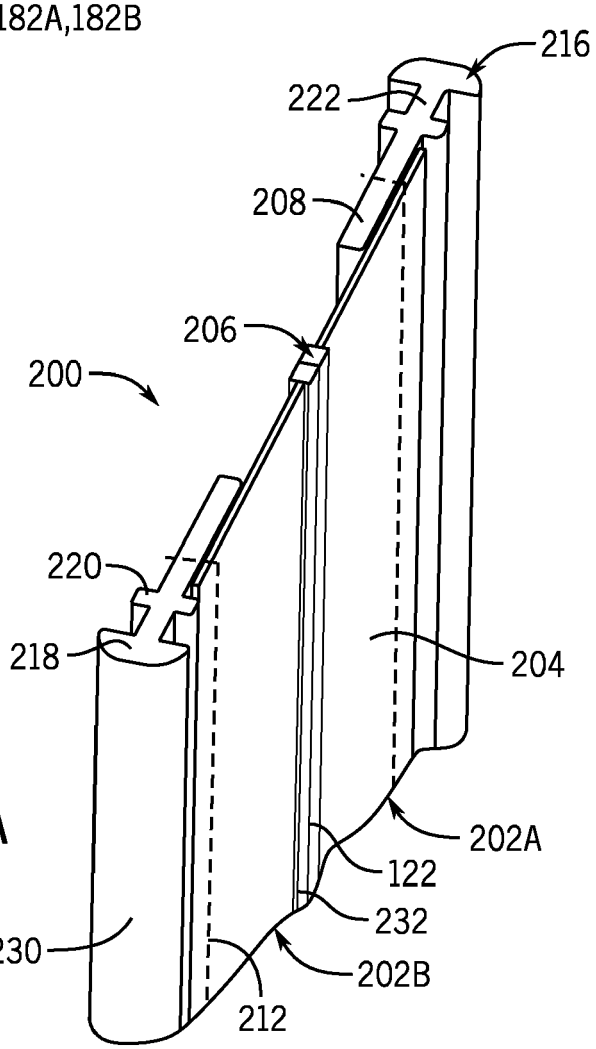

216
222
208
206
200
220
218
204
202A
122
232
230
202B
212

FIG. 3A

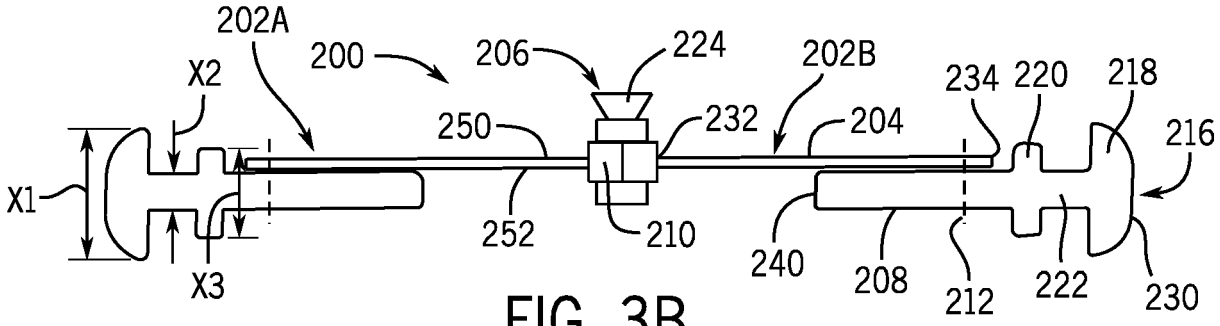


FIG. 3B

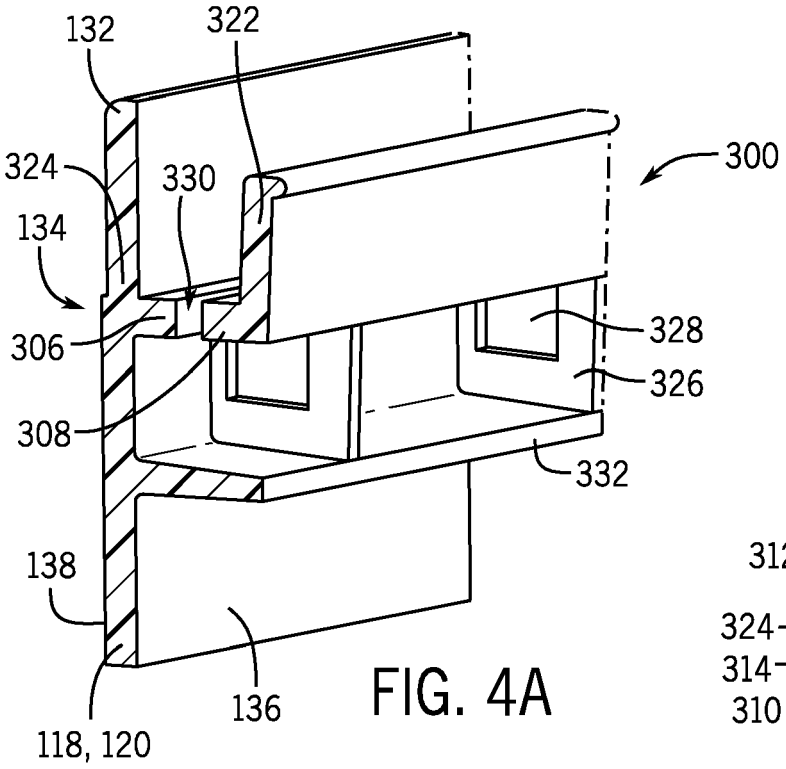


FIG. 4A

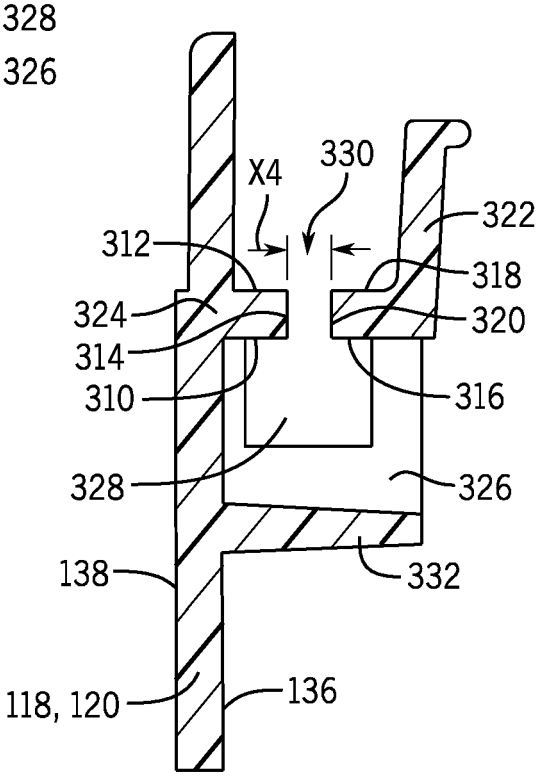


FIG. 4B

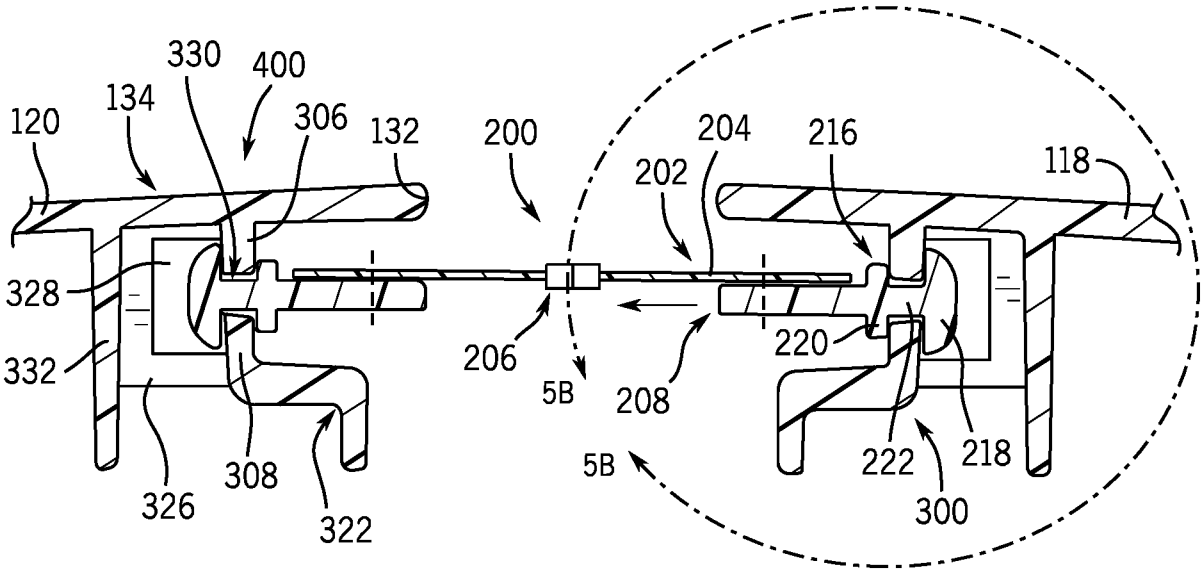

330
400
134
306
120
132
200
204
216
202
118
328
206
220
332
5B
208
5B
222
218
326
308
322
300

FIG. 5A

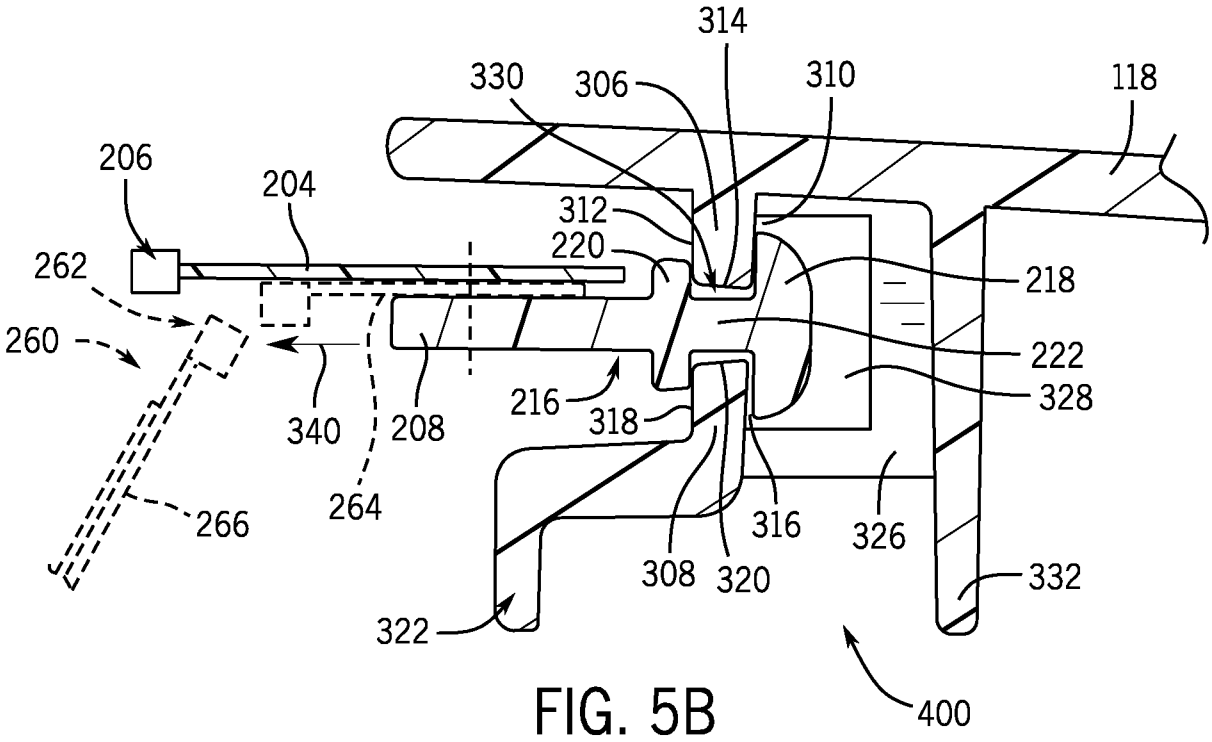

314
330
306
310
118
206
204
312
220
262
218
260
222
328
340
208
216
318
266
264
316
326
308
320
332
322
400

FIG. 5B

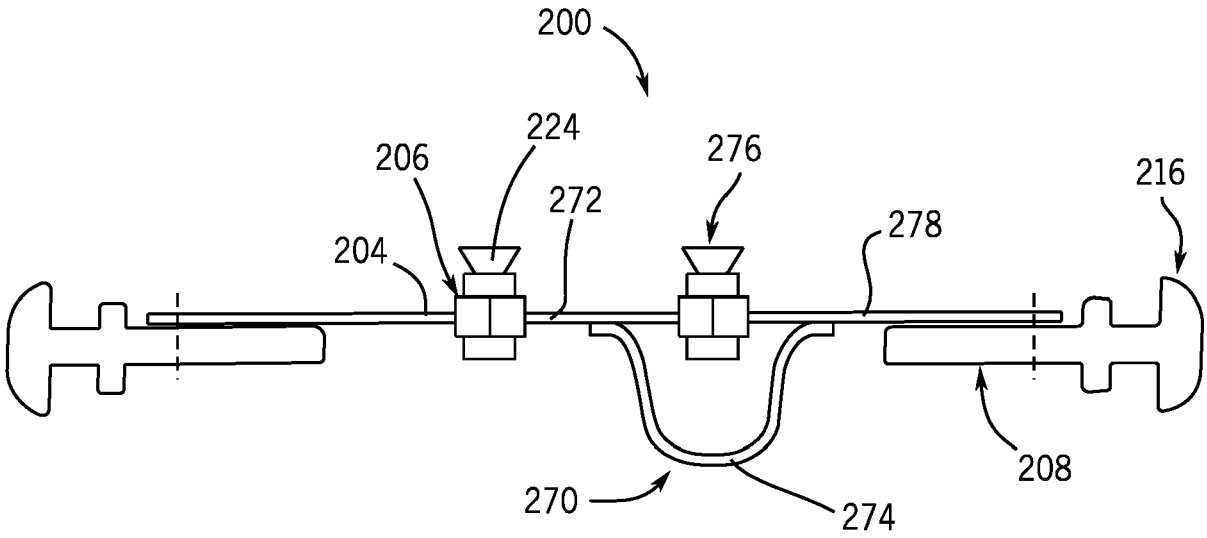


FIG. 6

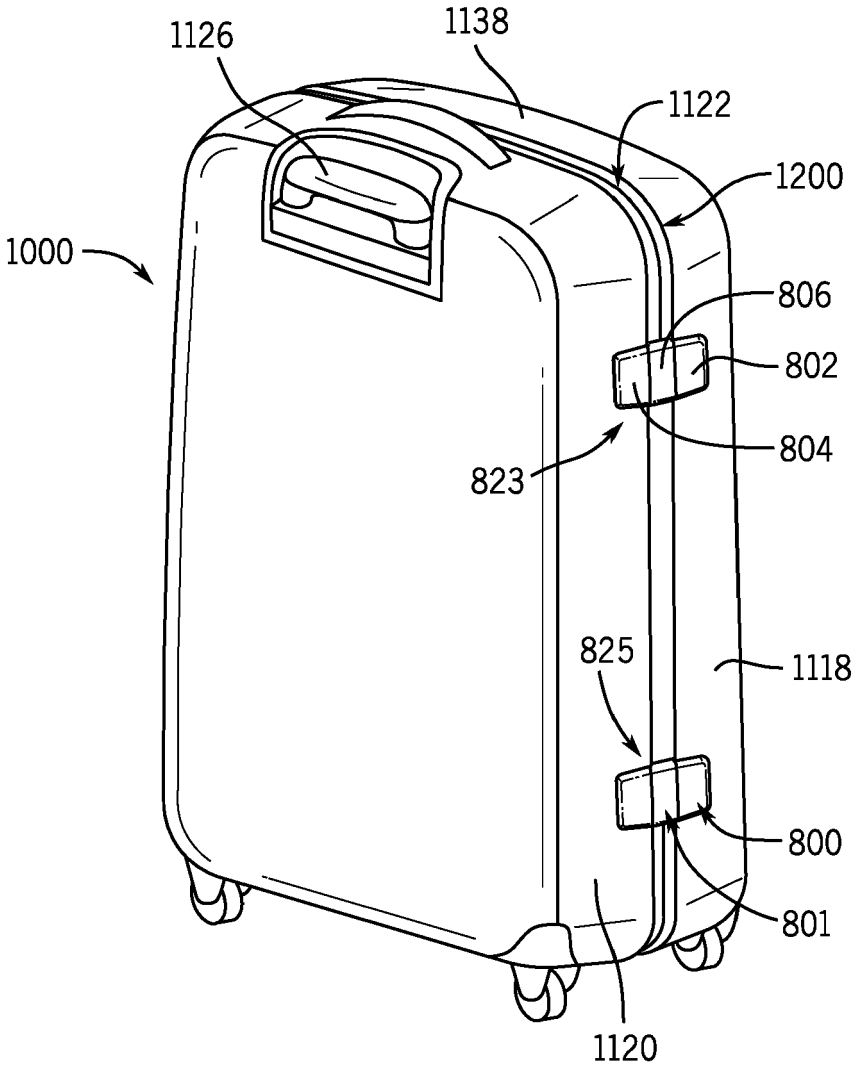


FIG. 7

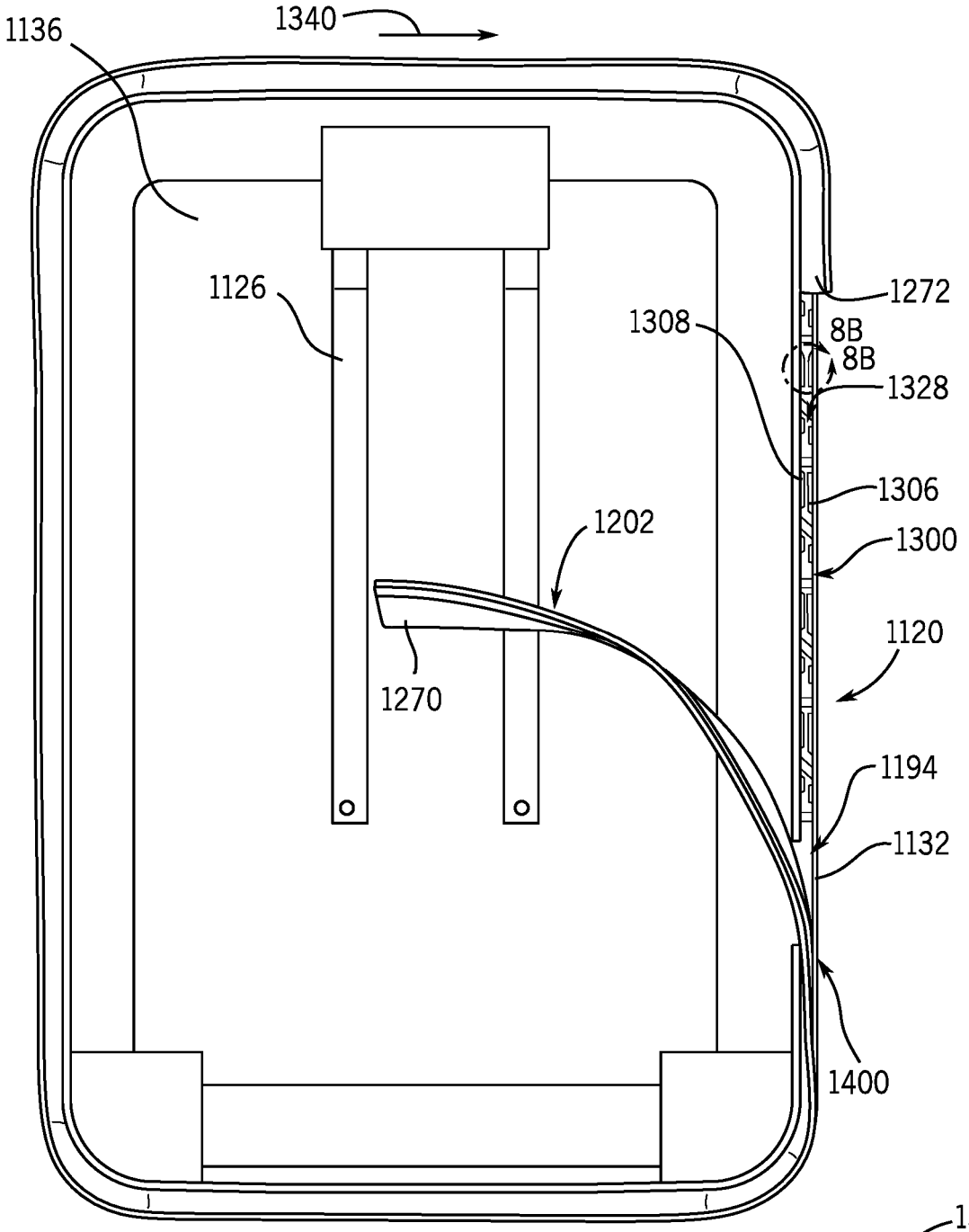
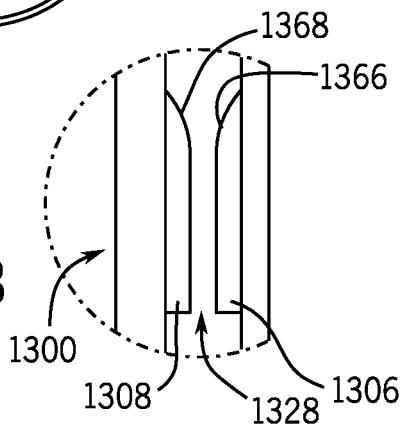

1340
1136
1126
1272
1308
8B
8B
1328
1306
1202
1300
1120
1270
1194
1132
1400

FIG. 8A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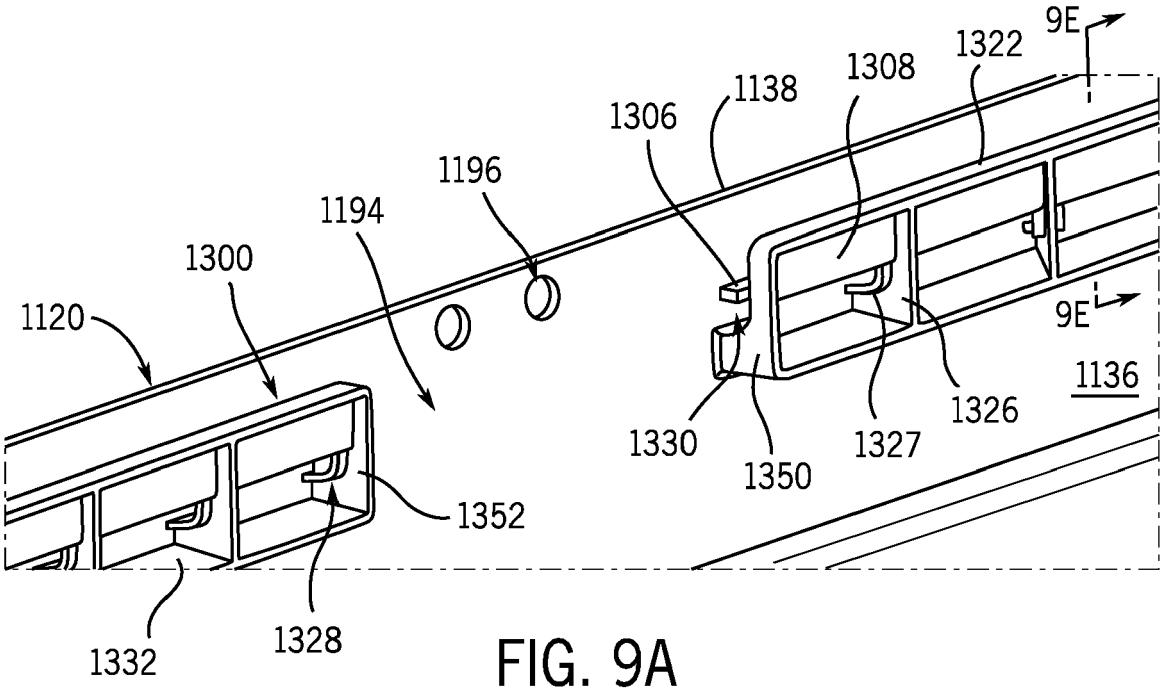
1366
1300
1308
1328
1306

FIG. 8B


9E
1322
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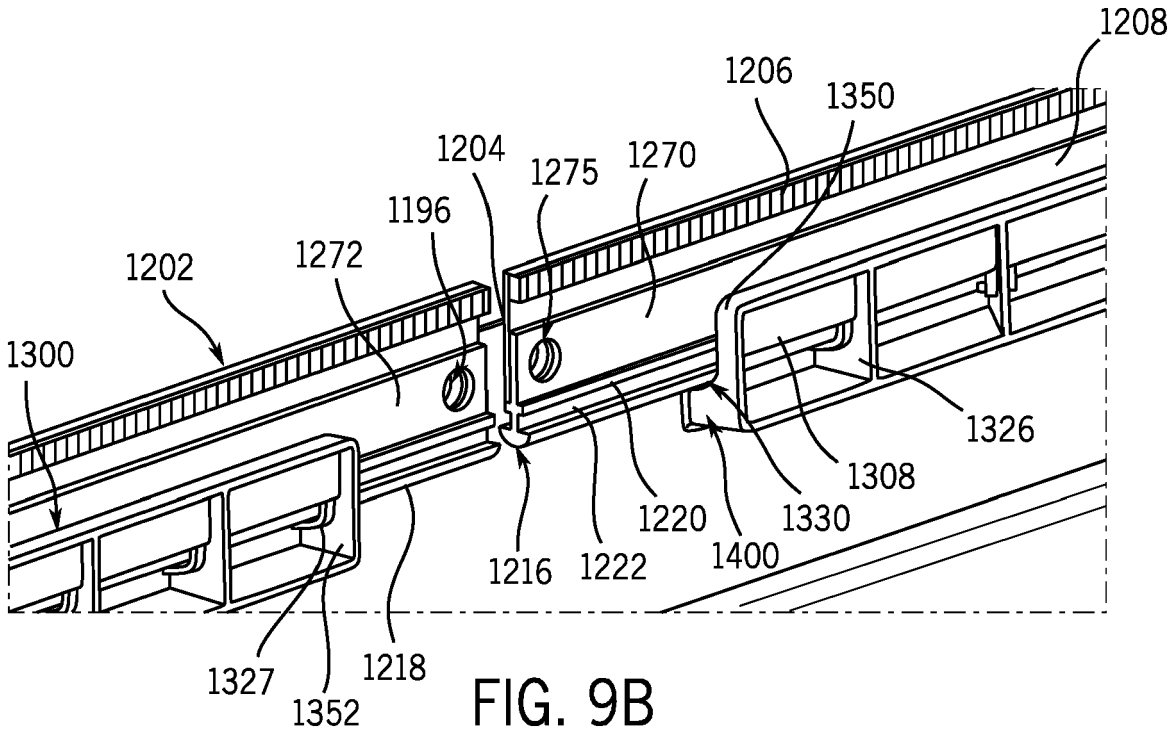
9E
1136
1326
1330
1327
1350
1352
1332
1328

FIG. 9A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1400
1216
1222
1327
1352
1218

FIG. 9B

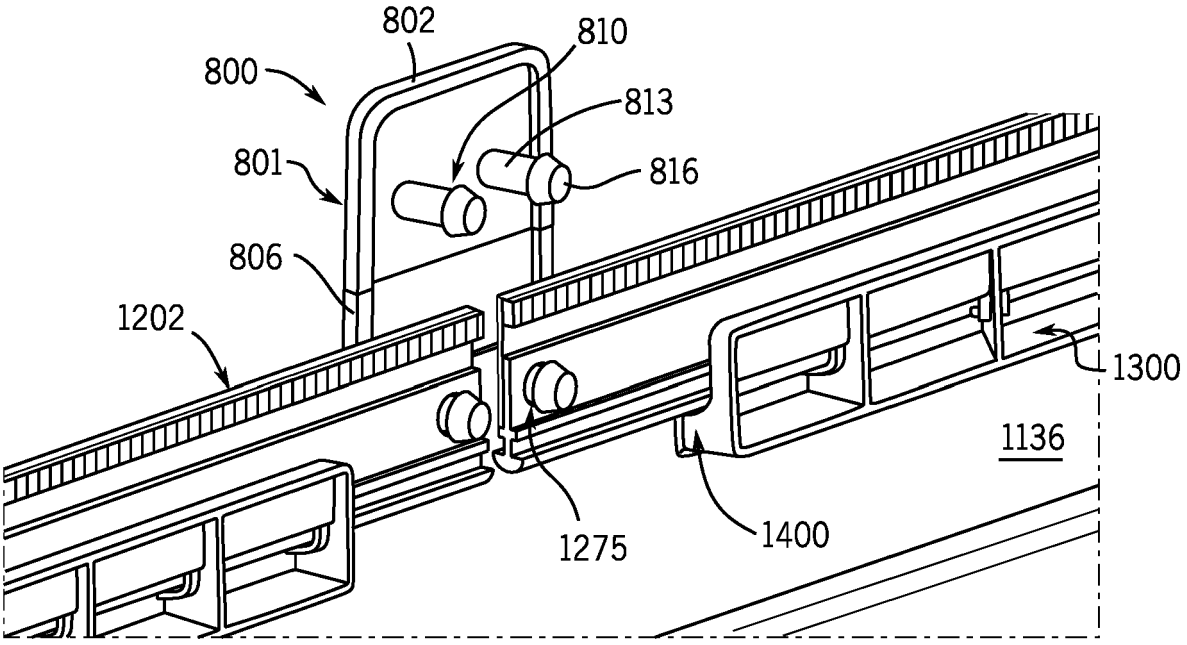


FIG. 9C

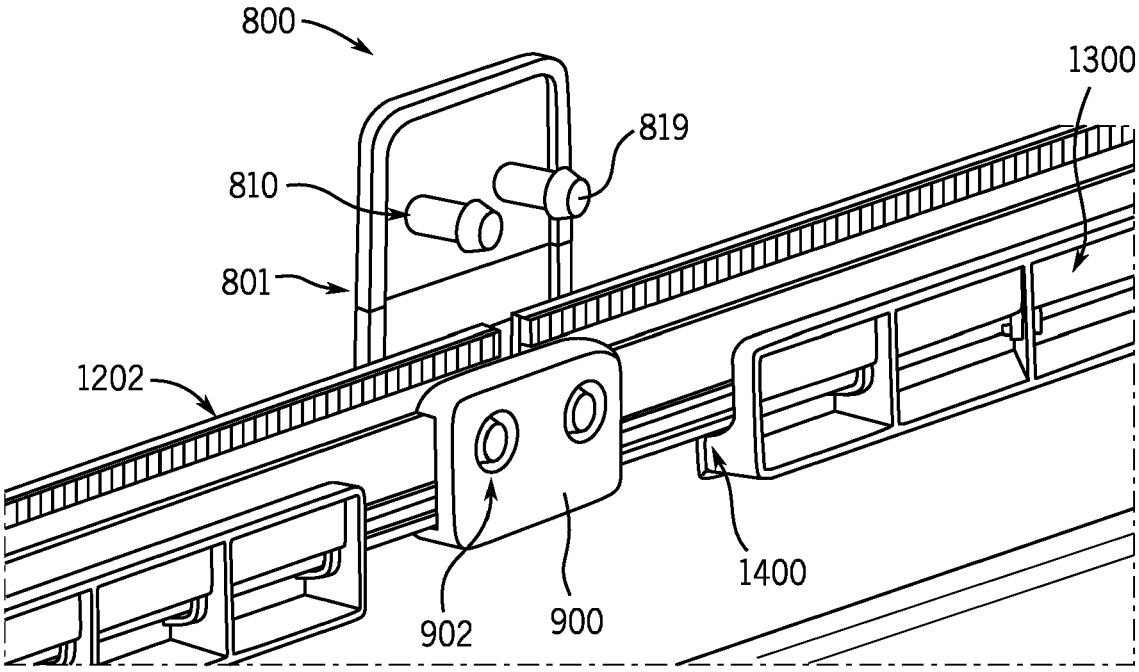
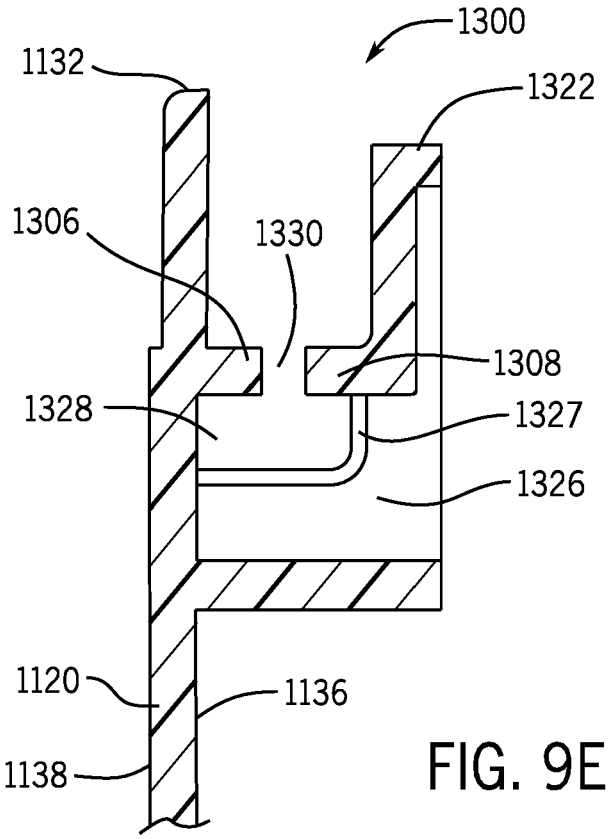

800
1300
819
810
801
1202
1400
902
900

FIG. 9D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1306
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1308
1328
1327
1326
1120
1136
1138

FIG. 9E

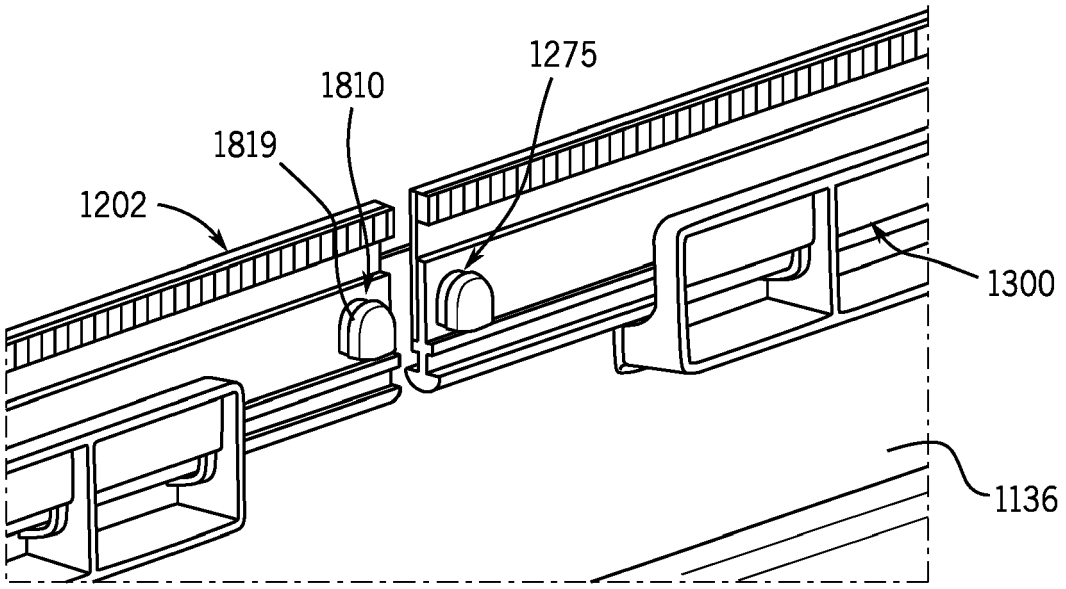
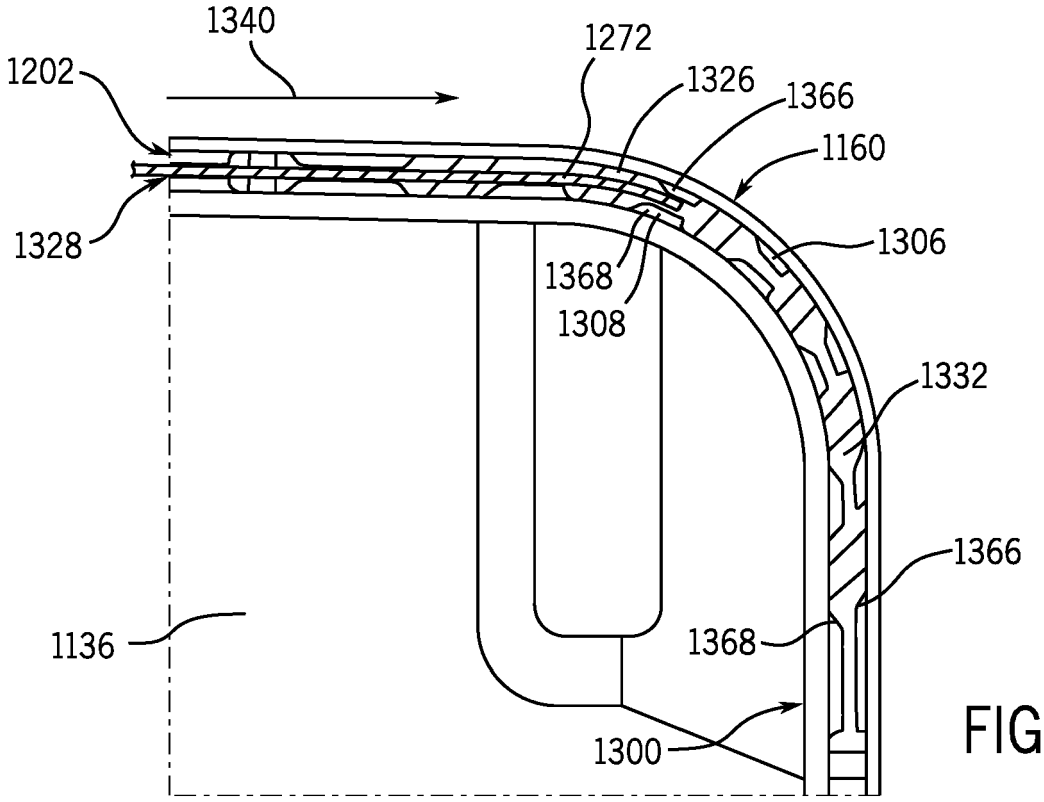

1275
1810
1819
1202
1300
1136

FIG. 10


1340
1272
1202
1326
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1328
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1308
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1136
1368
1300

FIG. 11

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EUROPEAN SEARCH REPORT

Application Number
EP 23 21 2289

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 8 695 769 B2 (MORSZECK DIETER [DE]; RIMOWA GMBH [DE]) 15 April 2014 (2014-04-15) * column 2, line 29 - column 3, line 41; figures 1-7 *	1-6, 8-10, 13-15 7,11,12	INV. A45C13/10 A45C5/14
X Y	WO 2015/007203 A1 (GUANGZHOU WINTIMES ALUMINUM PRODUCTS CO LTD [CN]) 22 January 2015 (2015-01-22) * paragraph [0005] - paragraph [0035]; figures 3, 4 *	1-6, 8-10, 13-15 7,11,12	
X Y	US 2022/232939 A1 (HOU YISHUN [CN] ET AL) 28 July 2022 (2022-07-28) * paragraph [0018] - paragraph [0035]; figures 1-6 *	1-6, 8-10, 13-15 7,11,12	
X Y	EP 2 374 366 A1 (C & C LUGGAGE MFG CO LTD [CN]) 12 October 2011 (2011-10-12) * paragraph [0009] - paragraph [0015]; figures 3, 4 *	1-5, 8-10, 13-15 7,11,12	TECHNICAL FIELDS SEARCHED (IPC) A45C A44B
Y	US 3 443 671 A (DYKE HERBERT GORDON) 13 May 1969 (1969-05-13) * column 3, line 22 - column 14, line 6; figures 1-9, 48-58 *	7	A45F
Y	EP 3 549 480 A1 (VICTORINOX AG [CH]) 9 October 2019 (2019-10-09) * HINGES (11); paragraph [0024] - paragraph [0026]; figure 1 *	11,12	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 April 2024	Ehrsam, Sabine

CATEGORY OF CITED DOCUMENTS

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04-04-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 8695769 B2	15-04-2014	BR PI0808109 A2	17-06-2014
		CA 2683481 A1	04-09-2008
		CN 101686744 A	31-03-2010
		CY 1117526 T1	26-04-2017
		DE 202007002966 U1	10-07-2008
		DK 2117372 T3	27-06-2016
		EP 2117372 A1	18-11-2009
		ES 2573660 T3	09-06-2016
		HK 1133161 A1	19-03-2010
		HR P20160634 T1	01-07-2016
		HU E029501 T2	28-02-2017
		JP 5429805 B2	26-02-2014
		JP 2010518930 A	03-06-2010
		PL 2117372 T3	30-09-2016
		US 2010320047 A1	23-12-2010
		WO 2008104558 A1	04-09-2008
WO 2015007203 A1	22-01-2015	CN 103330364 A	02-10-2013
		US 2016157574 A1	09-06-2016
		WO 2015007203 A1	22-01-2015
US 2022232939 A1	28-07-2022	AU 2020404201 A1	12-05-2022
		AU 2023237102 A1	12-10-2023
		CN 210901804 U	03-07-2020
		EP 4029403 A1	20-07-2022
		JP 7454168 B2	22-03-2024
		JP 2022553747 A	26-12-2022
		US 2022232939 A1	28-07-2022
		WO 2021121014 A1	24-06-2021
EP 2374366 A1	12-10-2011	NONE	
US 3443671 A	13-05-1969	NONE	
EP 3549480 A1	09-10-2019	NONE	

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