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(54) **HELMET COVER ASSEMBLY**

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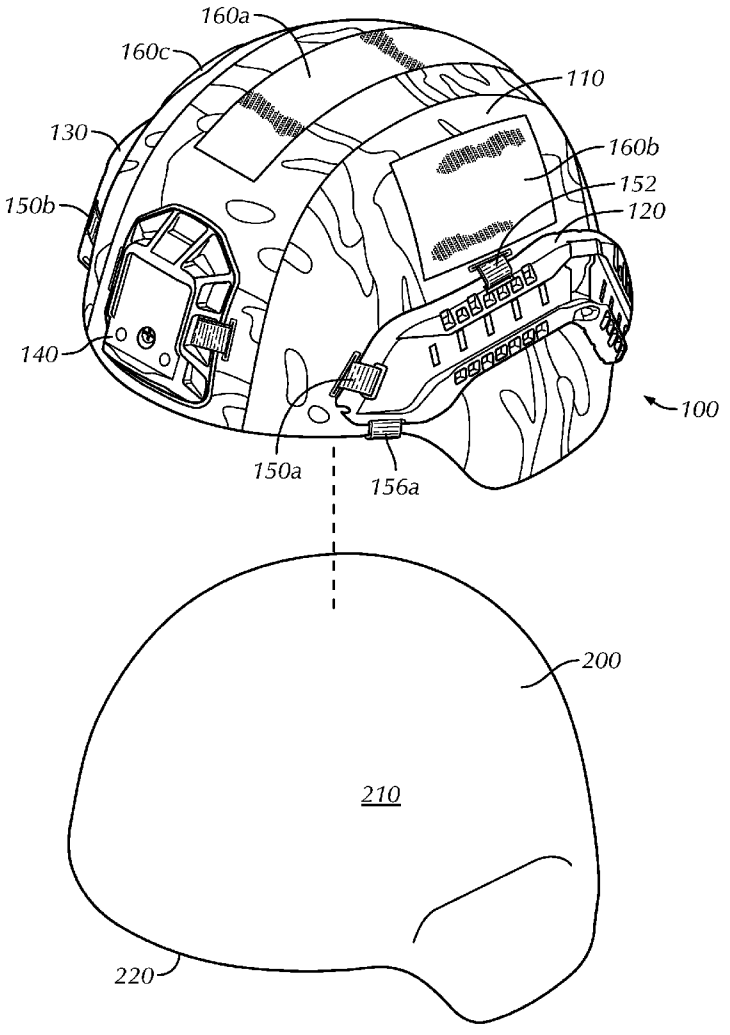
(57) **ABSTRACT**

A helmet cover assembly including a cover configured to extend over a helmet, at least one mounting device coupled to the cover; and one or more straps coupled to the at least one mounting device and configured to tighten the cover to the helmet. A helmet cover assembly including a cover configured to extend over a helmet, a first mounting device coupled to a first lateral side of the cover, a second mounting device coupled to a second lateral side of the cover, and an adjustable length strap coupled to the first mounting device and the second mounting device and configured to adjust the distance between the first mounting device and the second mounting device.



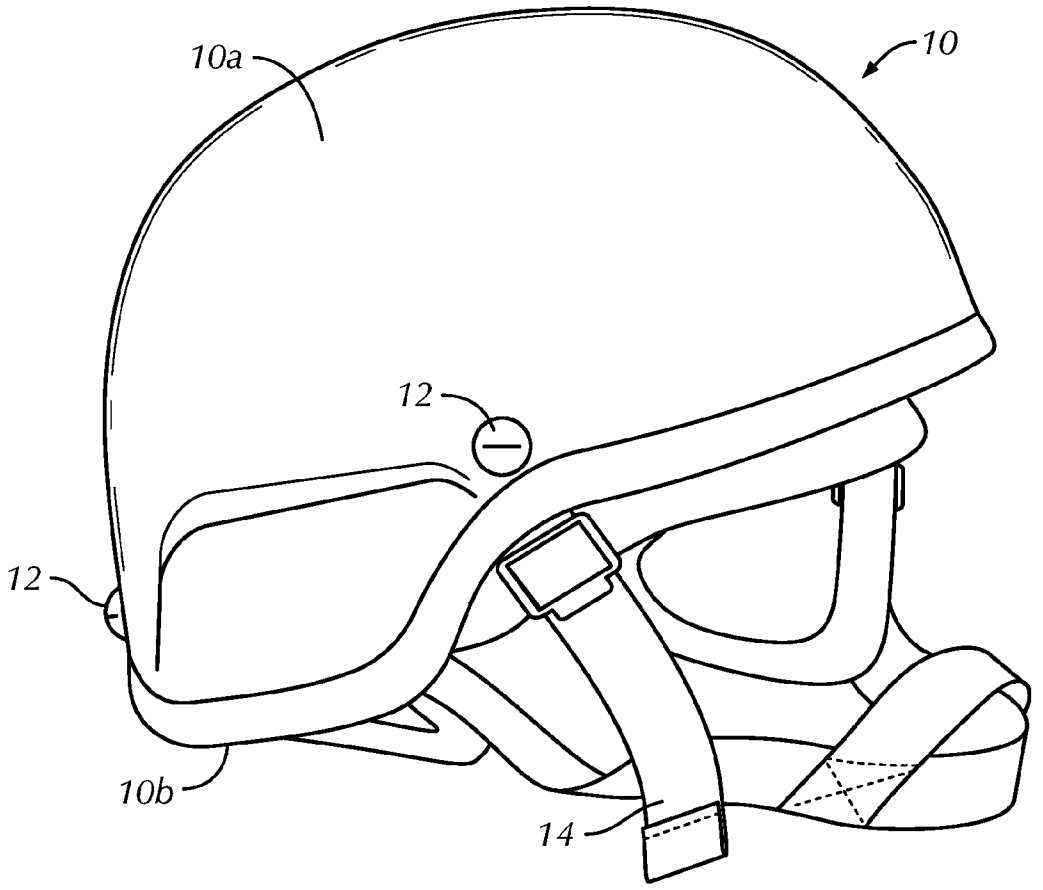
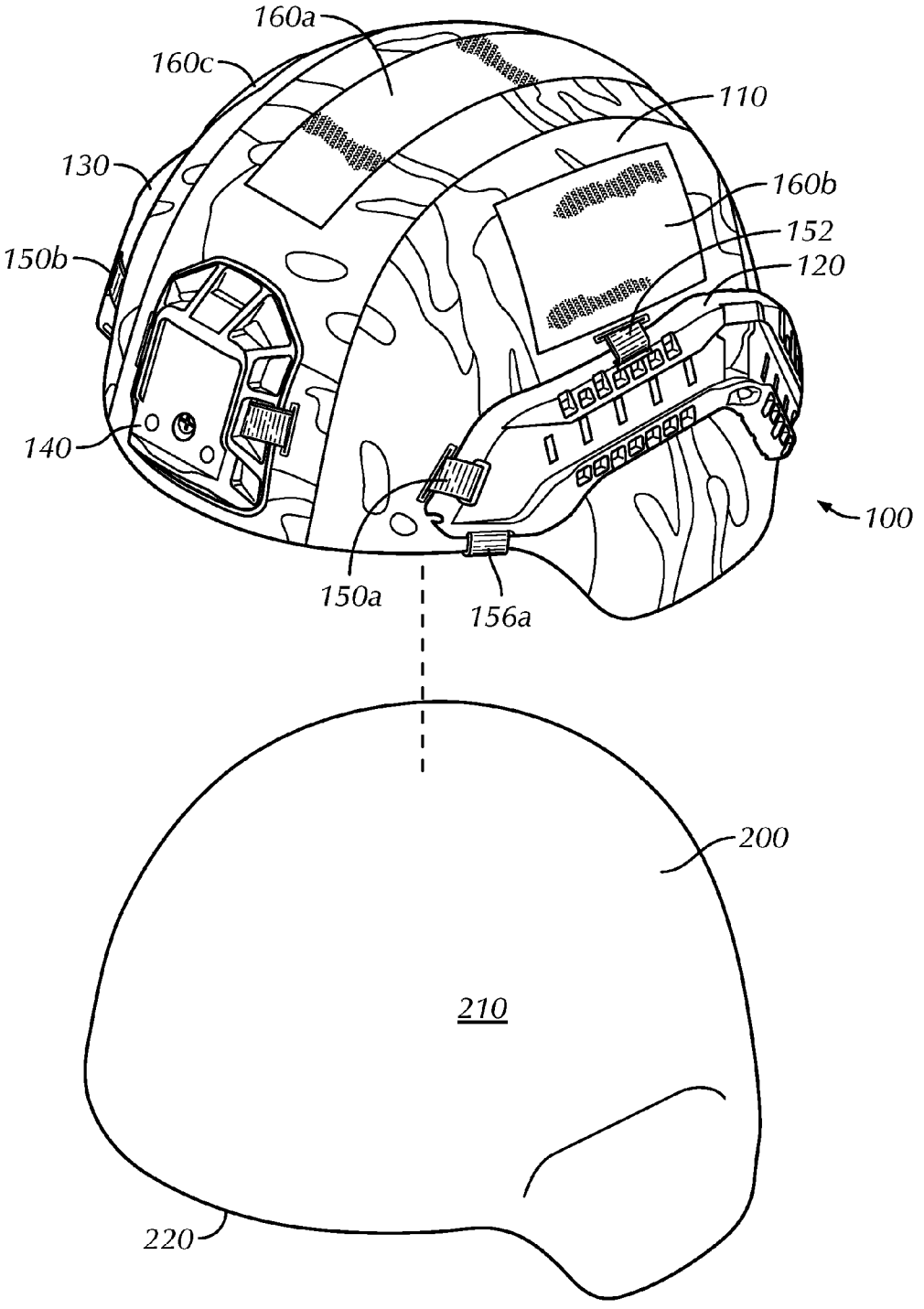


FIG. 1
(Prior Art)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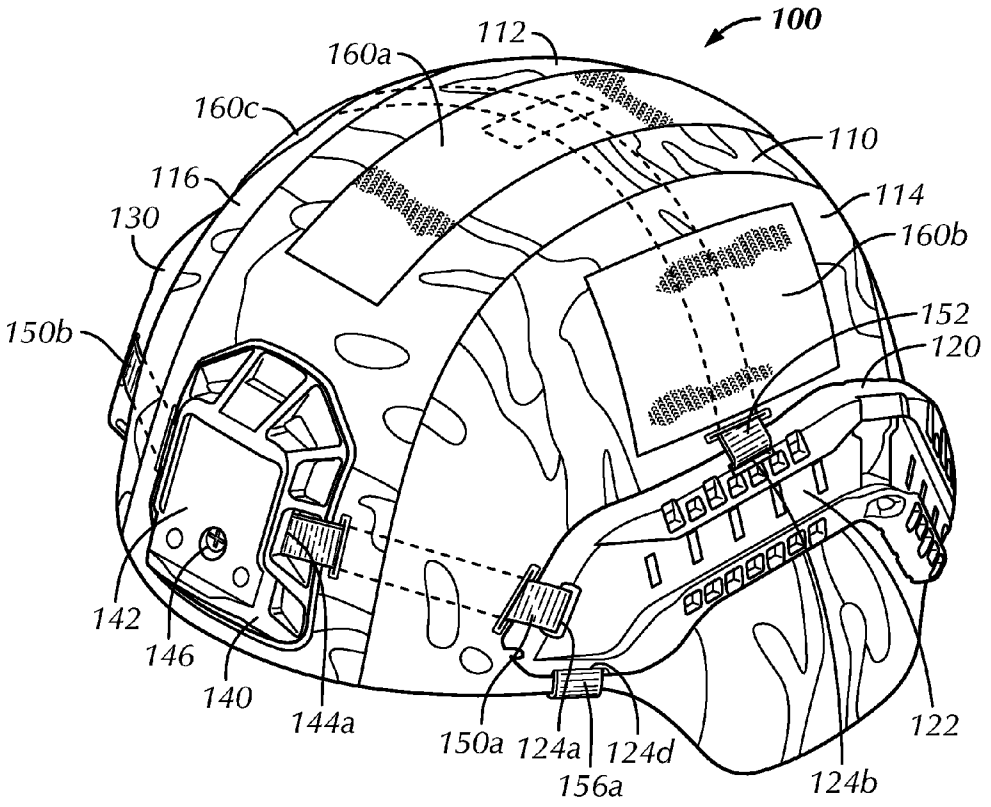
210
220

FIG. 2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160a
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110
116
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144a
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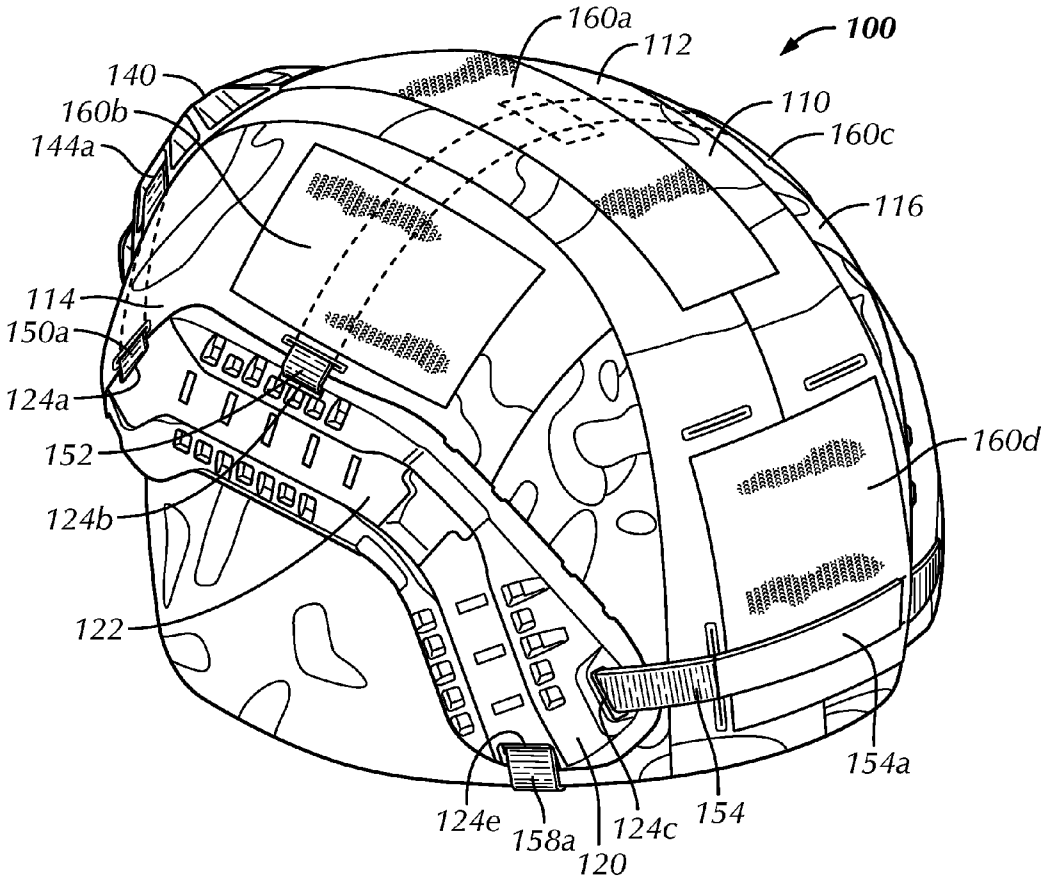
124d
156a
124b
122

FIG. 3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100
140
160b
144a
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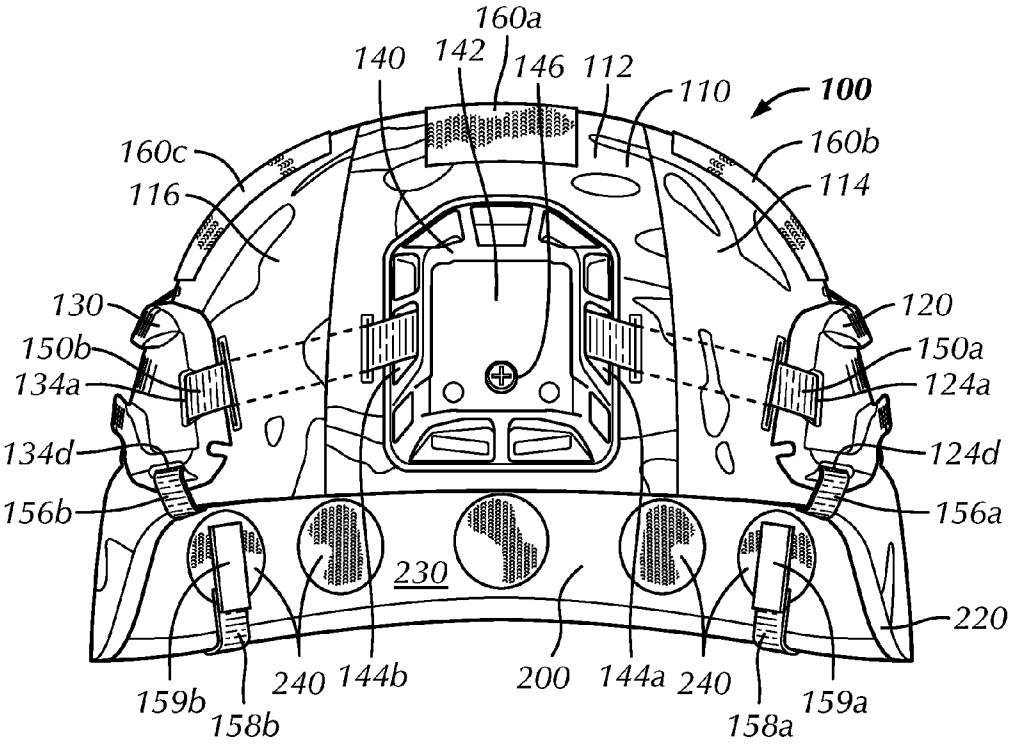
124e
158a
124c
154
120

FIG. 4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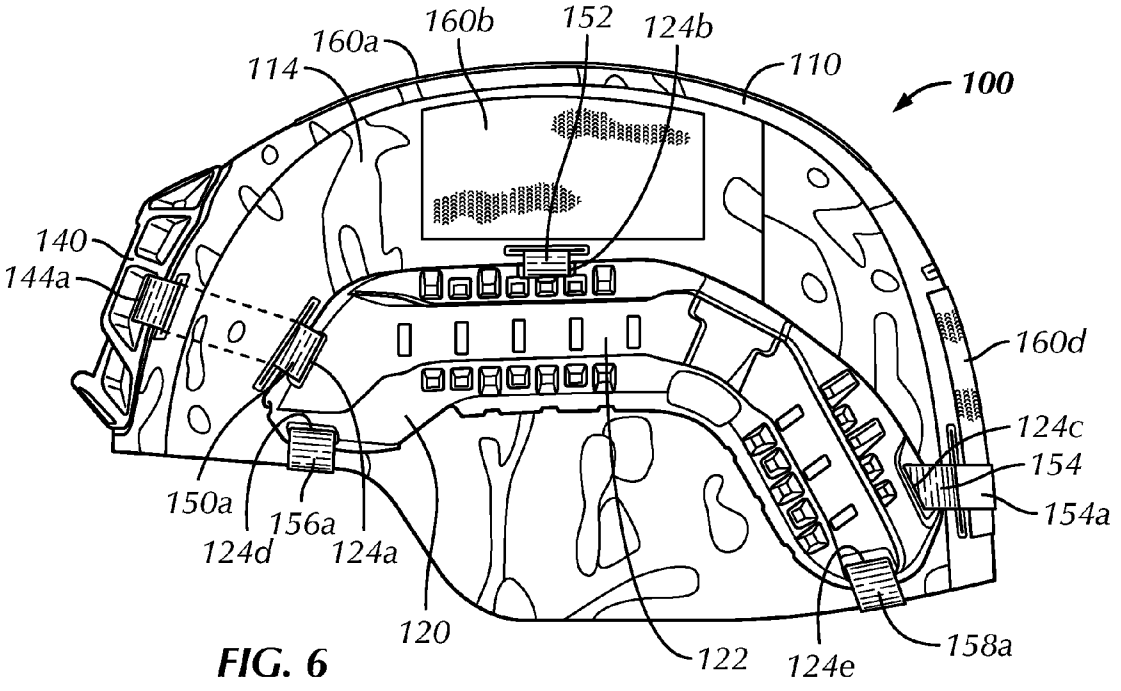
150a
134a
124a
134d
124d
156b
156a
230
220
159b
158b
240
144b
200
144a
240
158a
159a

FIG. 5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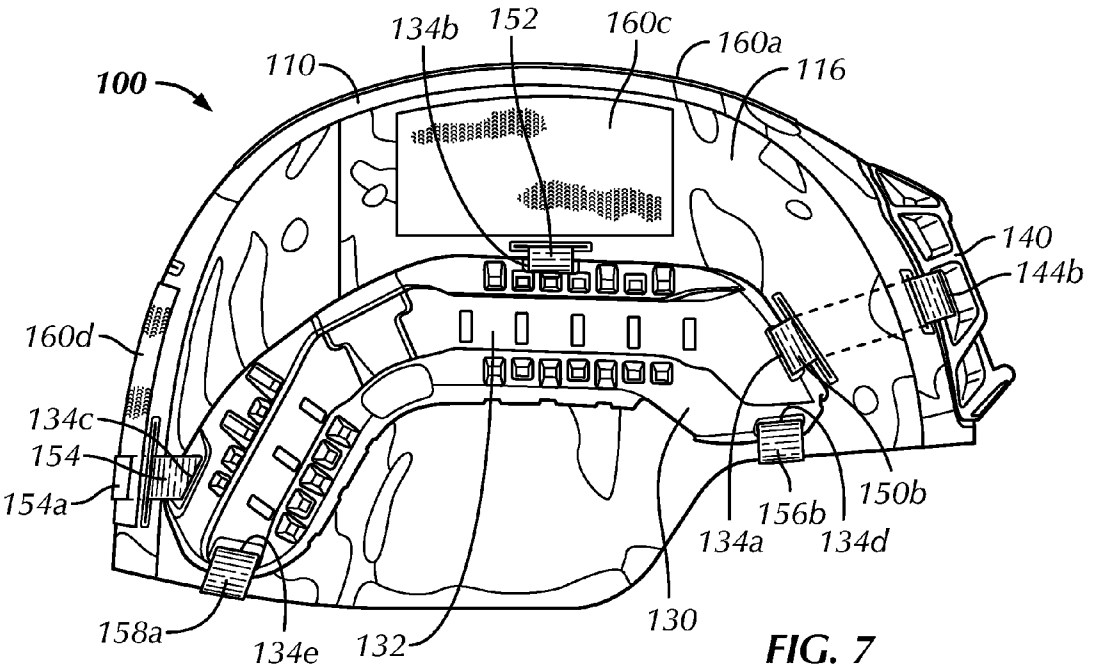
156a
124d
124a
120
122
124e
158a

FIG. 6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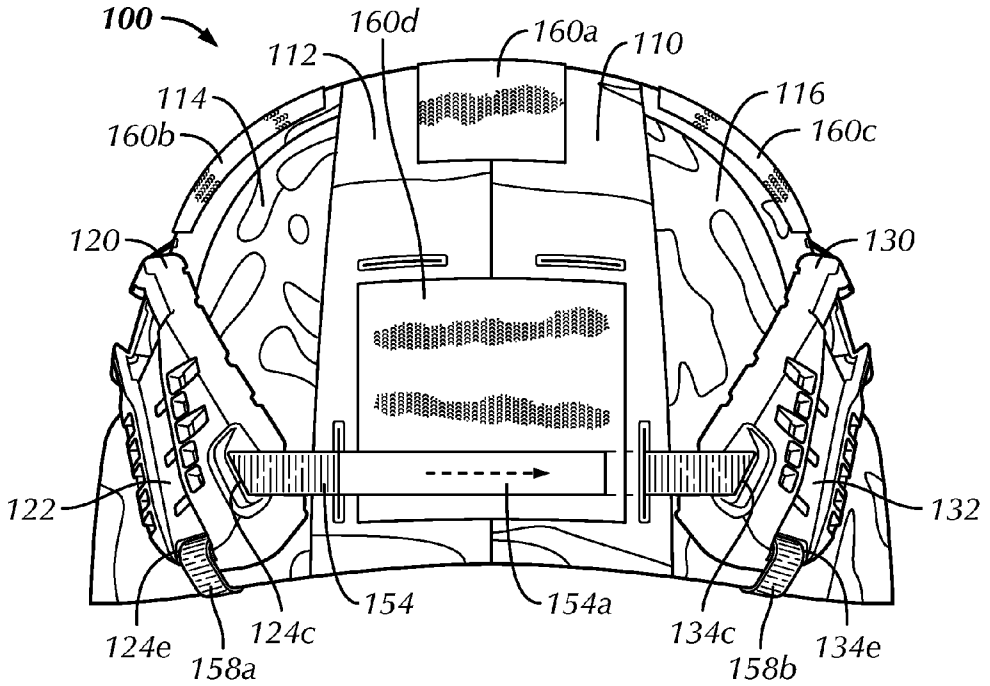
134a
156b
150b
134d

FIG. 7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154a
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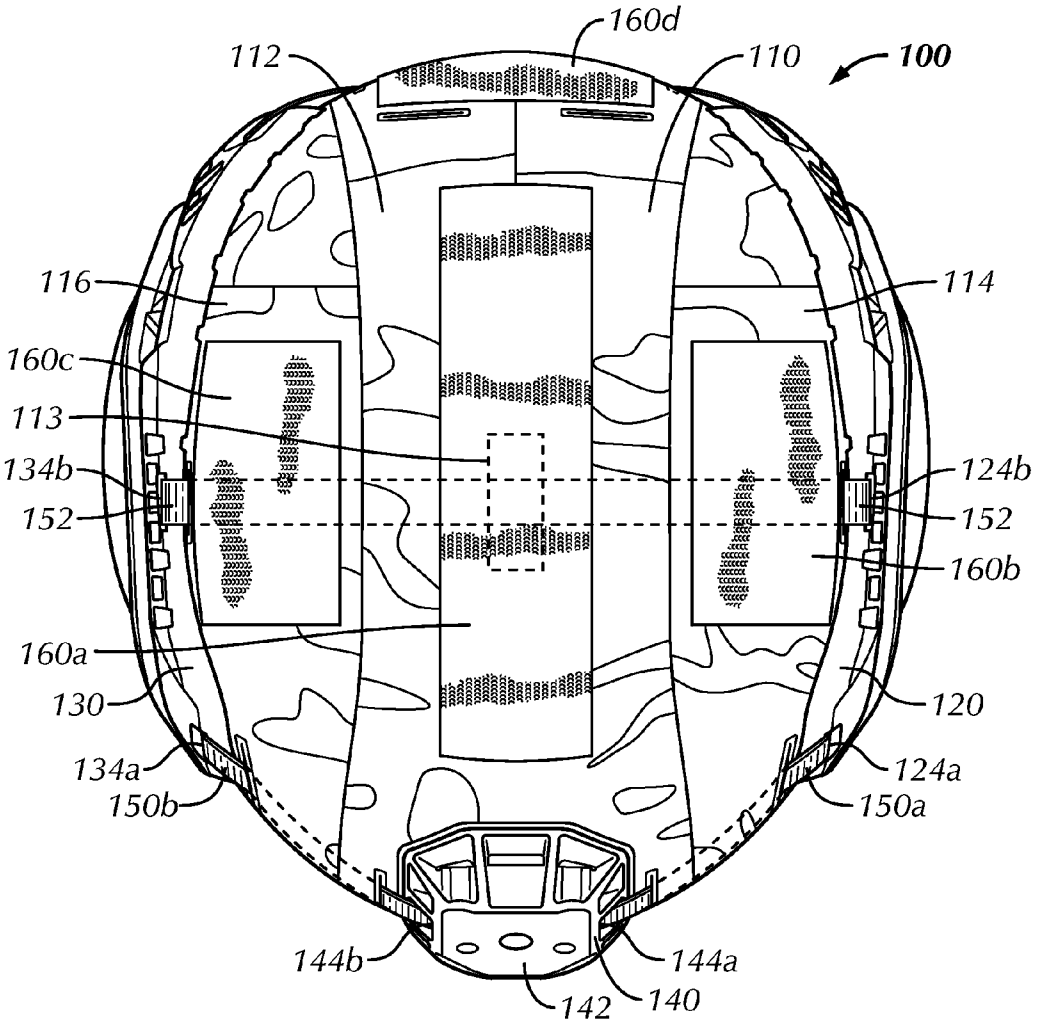
158a
124c
134c
158b
134e

FIG. 8


160d
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114
160c
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152
160b
160a
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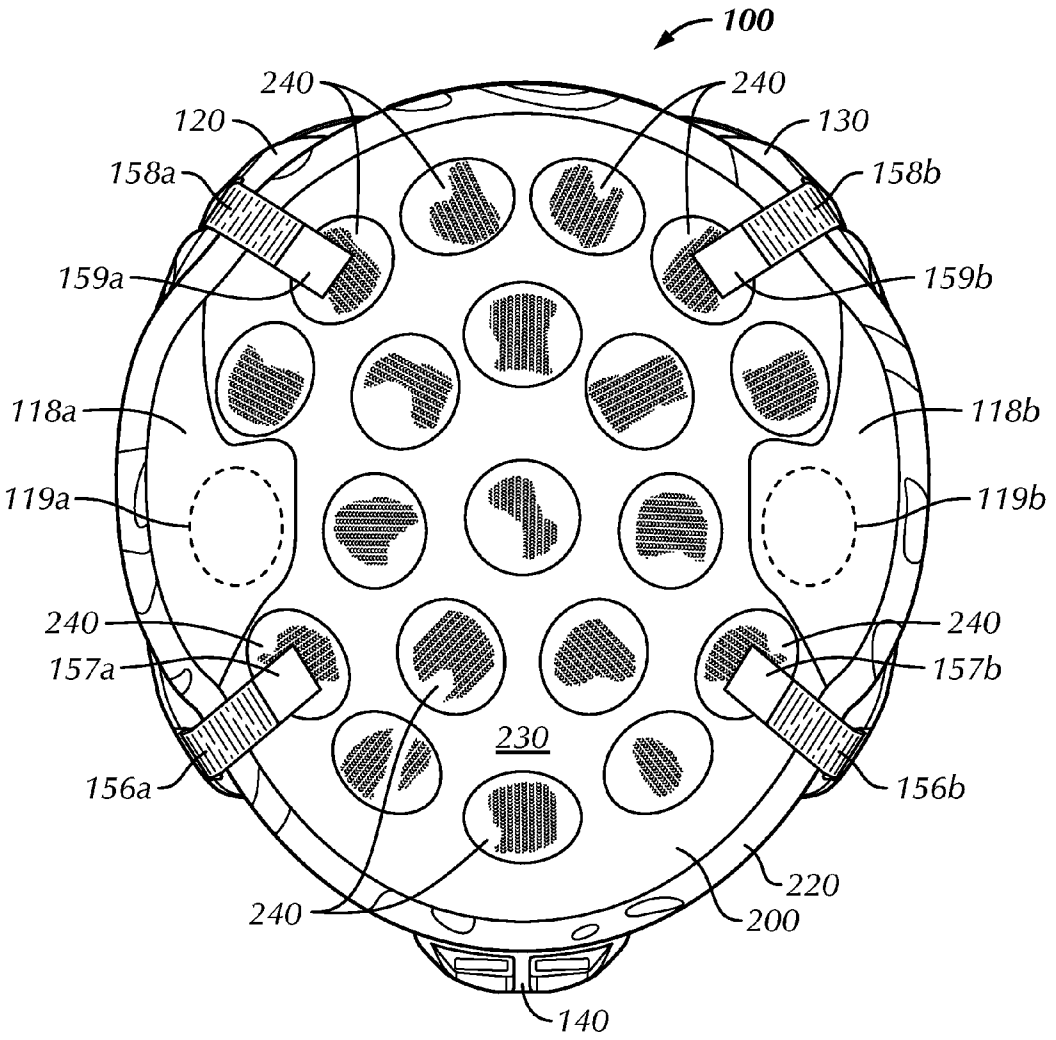
124a
150b
150a
144b
144a
142
140

FIG. 9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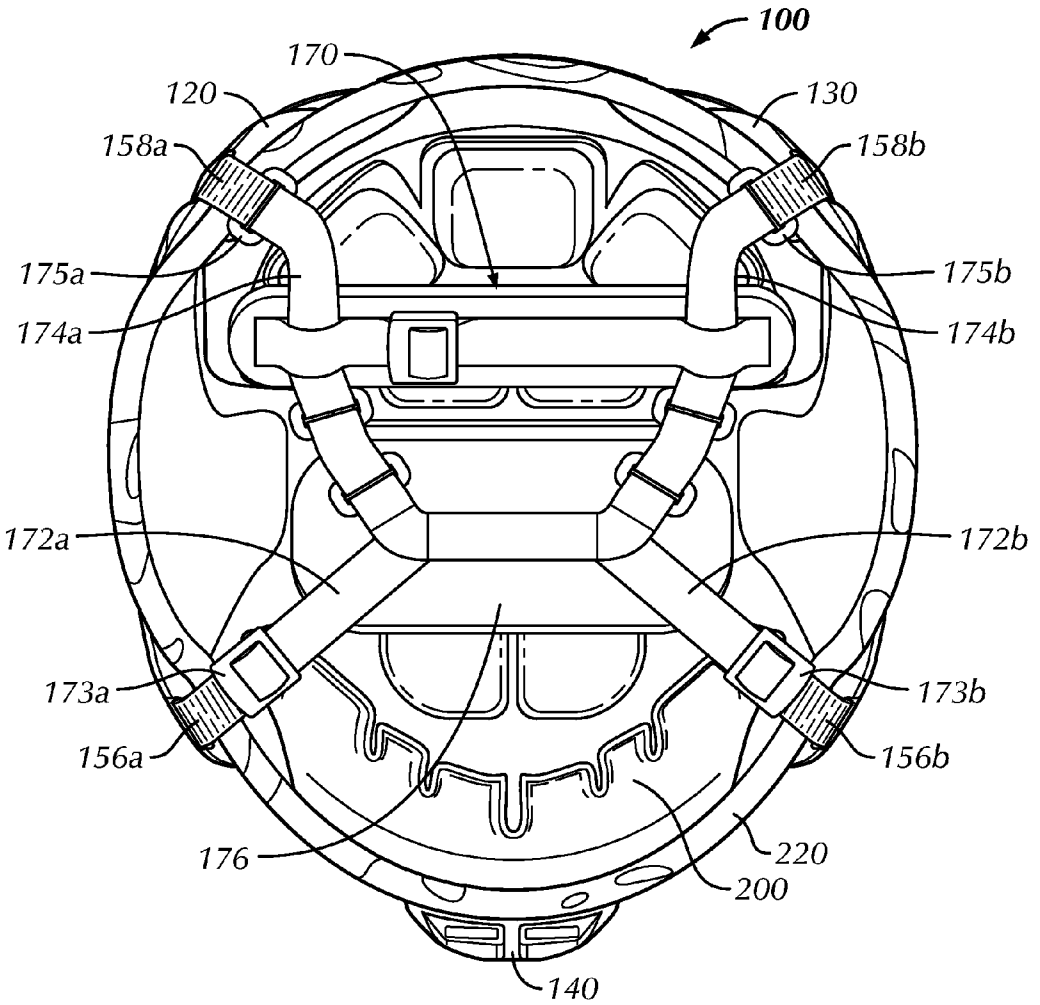
240
240
120
130
158a
158b
159a
159b
118a
118b
119a
119b
240
240
157a
157b
230
156a
156b
220
240
200
140

FIG. 10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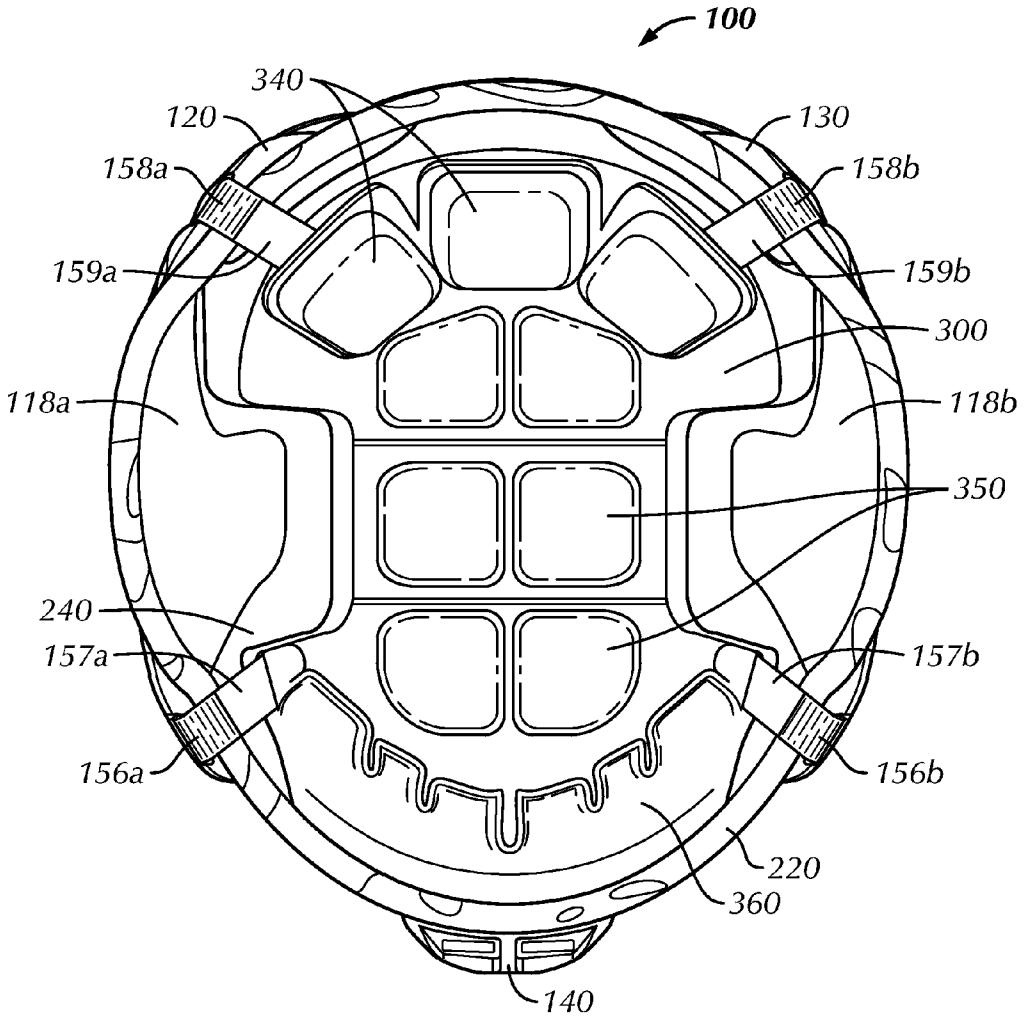
170
120
130
158a
158b
175a
175b
174a
174b
172a
172b
173a
173b
156a
156b
176
220
200
140

FIG. 11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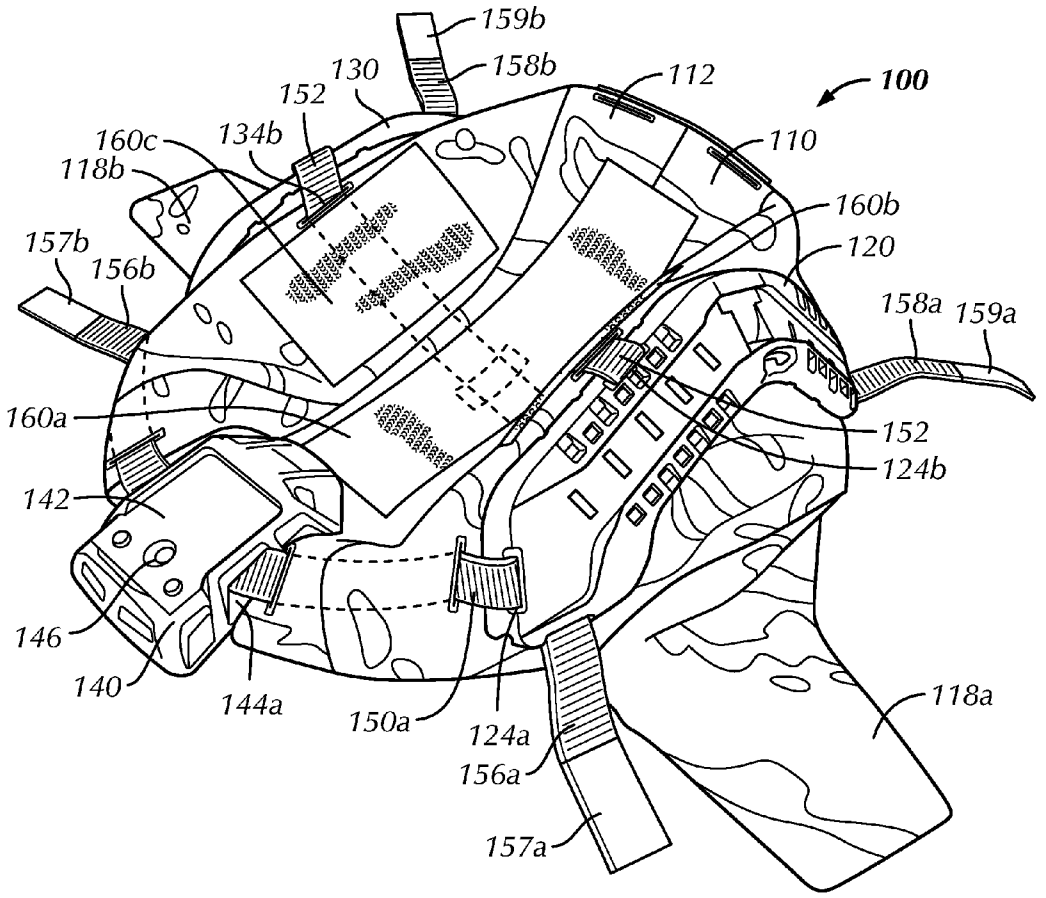
340
120
130
158a
158b
159a
159b
300
118a
118b
350
240
157a
157b
156a
156b
220
360
140

FIG. 12


159b
158b
130
152
112
100
160c
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118b
160b
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156b
158a
159a
160a
152
124b
142
146
140
144a
150a
124a
118a
156a
157a

FIG. 13

HELMET COVER ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 62/055,138 filed Sep. 25, 2014, U.S. Provisional Patent Application No. 62/099,254 filed Jan. 2, 2015, and U.S. Provisional Patent Application No. 62/206,879 filed Aug. 19, 2015, all of which are incorporated herein by reference in their entireties.

FIELD OF THE INVENTION

[0002] The present invention generally relates to a helmet cover assembly, and in some embodiments, a helmet cover assembly having one or more accessory mounting devices.

BACKGROUND OF THE INVENTION

[0003] Helmets for head protection are worn in a variety of environments and for various purposes including adventure, sporting, police and military purposes. An example of a ballistic helmet **10** used in the military is shown in FIG. **1**. Helmet **10** generally includes a helmet shell **10***a* having a peripheral edge **10***b* and a retention system (e.g., chinstrap) **14** that may be attached to helmet shell **10***a* using screws or bolts **12** that penetrate through helmet shell **10***a*. Accessory devices may be added or attached to helmet **10** according to the needs of the wearer and the demands of the environment in which helmet **10** is to be used. Accessory devices may include, for example, night vision goggles, lights, face shields, headsets, cameras, eye protection goggles or visors, oxygen masks and other devices. The method of attaching accessories to helmet **10** may include attaching a mount to helmet shell **10***a* that is configured to couple with an accessory device. The accessory may be releaseably coupled to the mount so that the accessory can be removed from helmet **10** when not in use. Mounts are typically attached to helmet shell **10***a* by using screws or snaps that require holes to be drilled in helmet shell **10***a*. However, drilling holes in helmet shell **10***a* may weaken the integrity of helmet **10** and/or decrease the amount of protection that helmet **10** can provide to a user.

BRIEF SUMMARY OF THE INVENTION

[0004] In one embodiment there is a helmet cover assembly comprising: a cover configured to extend over a helmet; at least one mounting device coupled to the cover; and one or more straps coupled to the at least one mounting device and configured to tighten the cover to the helmet. In one embodiment, the at least one mounting device includes at least two mounting devices and the one or more straps are coupled between the at least two mounting devices, wherein the one or more straps are configured to pull the at least two mounting devices together and tighten the cover to the helmet. In one embodiment, the at least two mounting devices are coupled to one another by one or more fixed length straps. In one embodiment, the at least two mounting devices are coupled to the cover only through the use of the one or more straps.

[0005] In a further embodiment, the helmet cover assembly comprises a helmet retention system configured to retain the helmet to a user's head, the helmet retention system being coupled to the cover through the use of one or more straps. In one embodiment, at least one of the one or more straps is coupled to the at least one mounting device and configured to couple to an inner surface of the helmet. In one embodiment, the at least one mounting device includes a first rail, a second rail, and a shroud, the first rail being coupled to the second rail by an adjustable strap configured to pull the first rail and the second rail together to tighten the cover to the helmet, the first rail being coupled to the second rail by a first fixed length strap, and the shroud being coupled to the first rail by a second fixed length strap and coupled to the second rail by a third fixed length strap.

[0006] In one embodiment, one of the at least one mounting device includes a bolt configured to be coupled to the helmet through a bolt hole in the helmet. In one embodiment, the cover includes a window receiving the at least one mounting device and configured to allow the at least one mounting device to directly contact an outer surface of the helmet. In one embodiment, the cover extends over an entire outer surface of the helmet. In one embodiment, the cover extends over a peripheral edge of the helmet and is attachable to the helmet using only the one or more straps and one or more hook and loop fasteners. In one embodiment, the cover extends over a peripheral edge of the helmet and is attachable to a liner of the helmet using only the one or more straps and one or more hook and loop fasteners. In one embodiment, the cover is comprised of a non-elastic material.

[0007] In another embodiment there is a helmet cover assembly comprising: a cover configured to extend over a helmet; a first mounting device coupled to a first lateral side of the cover; a second mounting device coupled to a second lateral side of the cover; and an adjustable length strap coupled to the first mounting device and the second mounting device and configured to adjust the distance between the first mounting device and the second mounting device. In another embodiment, there is a helmet cover assembly comprising: a cover configured to extend substantially over an entire outer surface of a helmet, the cover including a plurality of hook and loop fasteners configured to attached to corresponding hook and loop fasteners on an inner surface of the helmet; a first mounting rail coupled to a first lateral side of the cover; a second mounting rail coupled to a second lateral side of the cover; a fixed length strap extending between the first mounting rail and the second mounting rail, the cover extending at least partially over at least a portion of the fixed length strap; an adjustable length strap coupled to the first mounting device and the second mounting device and configured to adjust the distance between the first mounting device and the second mounting device; and a retention system coupled to the first mounting device and the second mounting device.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0008] The following detailed description of embodiments of the helmet cover assembly, will be better understood when read in conjunction with the appended drawings of exemplary embodiments. It should be understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown.

[0009] In the drawings:

[0010] FIG. **1** is an example of a helmet known in the art;

[0011] FIG. **2** is a front, top, left perspective view of a helmet cover assembly with a helmet in accordance with an exemplary embodiment of the present invention;

[0012] FIG. **3** is a front, top, left perspective view of the helmet cover assembly shown in FIG. **2** mounted on the helmet;

[0013] FIG. **4** is a rear, top, left perspective view of the helmet cover assembly shown in FIG. **2** mounted on the helmet;

[0014] FIG. **5** is a front elevational view of the helmet cover assembly shown in FIG. **2** mounted on the helmet;

[0015] FIG. **6** is a left-side elevational view of the helmet cover assembly shown in FIG. **2** mounted on the helmet;

[0016] FIG. **7** is a right-side elevational view of the helmet cover assembly shown in FIG. **2** mounted on the helmet;

[0017] FIG. **8** is a rear elevational view of the helmet cover assembly shown in FIG. **2** mounted on the helmet;

[0018] FIG. **9** is a top plan view of a helmet cover assembly shown in FIG. **2** mounted on the helmet;

[0019] FIG. **10** is a bottom plan view of the helmet cover assembly shown in FIG. **2** mounted on the helmet;

[0020] FIG. **11** is a bottom plan view of the helmet cover assembly shown in FIG. **2** mounted on a helmet having a helmet retention system according to an embodiment of the present invention;

[0021] FIG. **12** is a bottom plan view of the helmet cover assembly shown in FIG. **2** mounted on a helmet having a helmet liner according to a further embodiment of the present invention; and

[0022] FIG. **13** is a front, top, left perspective view of the helmet cover assembly of FIG. **2** shown without a helmet and in a partially collapsed configuration.

DETAILED DESCRIPTION OF THE INVENTION

[0023] The present subject matter will now be described more fully hereinafter with reference to the accompanying figures and examples, in which representative embodiments are shown. The present subject matter can, however, be embodied in different forms and should not be construed as limited to the embodiments set forth herein. All publications, patent applications, patents, and other references mentioned herein are incorporated by reference in their entirety.

[0024] Referring to the drawings in detail, wherein like reference numerals indicate like elements throughout, there is shown in FIGS. **2-13** a helmet cover assembly, generally designated **100**, in accordance with exemplary embodiments of the present invention. Helmet cover assembly **100** is preferably configured to be mounted to a head protection device, such as helmet **200**. Helmet **200** may be any type of helmet known in the art, for example, those used for sporting, police, or military purposes. In certain embodiments, helmet **200** is a standard infantry ballistic helmet, advanced combat helmet (ACH), or light weight advanced combat helmet (LWACH). In other embodiments, helmet **200** may be a modular integrated communications helmet (MICH), a tactical ballistic helmet (TBH), a lightweight marine helmet, police general duty helmet, or a personnel armor system for ground troops (PASGT) helmet. In certain preferred embodiments, helmet cover assembly **100** may be mounted to helmet **200** without the need for drilling any holes into helmet **200** or requiring holes to be pre-drilled or otherwise manufactured into helmet **200**. In some embodiments, helmet cover assembly **100** may be mounted to helmet **200** without the need for any tools. In some embodiments, helmet cover assembly **100** may be mounted to helmet **200** without the need for modification of helmet **200**.

[0025] In some embodiments, helmet cover assembly **100** is configured to cover all or at least a majority of exterior surface **210** of helmet **200** when mounted onto helmet **200**. Exterior surface **210** refers to the surface of helmet **200** which faces away from the user's head during use. In some embodiments, helmet cover assembly **100** is configured to fit snuggly over exterior surface **210** of helmet **200** when mounted onto helmet **200** such that no or minimal clearance exists between helmet cover assembly **100** and exterior surface **210**. In some embodiments, helmet cover assembly **100** generally includes a cover **110** to which one or more accessory mounts may be attached, for example, a left mounting rail **120**, a right mounting rail **130**, and/or a front shroud **140**. In some embodiments, attaching the one or more accessory mounts (e.g., **120**, **130**, **140**) to cover **110** avoids the need to attach these accessory mounts directly onto helmet **200**, which in turn may eliminate or at least reduce the need for drilling holes into helmet **200** that could compromise or weaken helmet **200** according to certain embodiments. Furthermore, in some embodiments, having the one or more accessory mounts attached to cover **110** rather than directly to helmet **200** can provide for a quicker and/or more convenient method of adding and/or removing the one or more accessory mounts to or from helmet **200** since, for example, no additional tools may be required (e.g., drill, screw driver, etc.), and the one or more accessory mounts can be added or removed from helmet **200** all at the same time rather than individually.

[0026] In some embodiments, cover **110** is configured to substantially match the contour of exterior surface **210** of helmet **200**. In some embodiments, cover **110** extends over all of or substantially all of exterior surface **210** of helmet **200**. In other embodiments, cover **110** may include one or more cutouts to expose one or more areas of exterior surface **210**. In some embodiments, cover **110** further extends over all or at least a portion of peripheral edge **220** of helmet **200**. Peripheral edge **220** refers to the rim of helmet **200** which defines the opening through which the user may place his/her head during use of helmet **200**. In some embodiments, cover **110** primarily includes one or more flexible panels that are configured to wrap around exterior surface **210** of helmet **200**. In some embodiments, cover **110** is constructed from one or more textile or fabric panels. In some embodiments, cover **110** is constructed from one or more panels which may be made from, for example, cotton, canvas, linen, twill, synthetic fabrics (e.g. nylon, polyester), ripstop fabrics, or combinations thereof. In some embodiments, when cover **110** is separated from helmet **200**, cover **110** may be folded, rolled, or crumpled to reduce volume for easier packing For example, FIG. **13** depicts helmet cover assembly **100** without a helmet where cover **110** is in a partially collapsed configuration. In some embodiments, cover **110** may be resistant to tearing, ripping and stretching. Cover **110** may also be chemically treated, for example, to be water or stain resistant. In some embodiments, cover **110** is made from a non-elastic material. In other embodiments, cover **110** is made from or includes at least some elastic materials. The panels may be sewn or stitched together at seams to form cover **110** or, in other embodiments, the panels may be glued or adhered together. Moreover, in some embodiments, cover **110** may be constructed from one or more panels that are colored, printed, or dyed to have a particular color (e.g., white, tan, olive drab, black) or particular designs and images, such as a camouflage pattern as shown. In some embodiments, one cover **110** could be switched for another having a different color or design to allow a user to quickly change appearance while keeping the same helmet (e.g., switching from a solid color to a camouflage pattern and vice versa).

[0027] As shown in FIGS. **3-9**, according to some embodiments cover **110** may include at least a central panel **112** that is sized and configured to extend over a top portion of helmet **200** from the front of helmet **200** to the rear of helmet **200**, a left panel **114** sized and configured to cover at least a portion of the left-side of helmet **200**, and a right panel **116** sized and configured to cover at least a portion of the right-side of helmet **200**. Central panel **112**, left panel **114**, and right panel **116** may be joined together at one or more seams to form cover **110** (e.g., by stitching, sewing, gluing, etc.). It should be appreciated that other panel arrangements and orientations may be utilized and that cover **110** is not necessarily limited to the specific arrangement shown in the illustrated embodiments. For example, in some embodiments cover **110** may be made from a single panel or, in alternative embodiments, may include more panels than what is shown for illustrative purposes. In some embodiments, for example, each of central panel **112**, left panel **114**, and right panel **116** may in turn be made from several smaller panels that are shaped to fit the curved contours of helmet **200**.

[0028] As discussed above, in some embodiments one or more accessory mounts can be attached to cover **110**. The one or more accessory mounts are configured to couple with various accessory devices and allow the accessory devices to be removably mounted onto cover assembly **100** and, in turn, onto helmet **200** during use. Some non-limiting examples of accessory devices include night vision goggles, lights, beacons, face shields, headsets, cameras, communication devices, sensors, eye protection goggles or visors, oxygen masks and other devices known in the art that may be mounted onto helmets. In some embodiments, helmet cover assembly **100** may be configured such that it can substantially support the weight of and forces exerted on the accessory devices as if the accessory mounts were attached directly to helmet **200**. In some embodiments, the one or more accessory mounts are not configured to be directly secured onto helmet **200**, but rather attached to cover **110** which in turn can be secured to helmet **200**. In some embodiments, the one or more accessory mounts may lack any holes for screw or bolt mounting onto helmet **200**. In alternative embodiments, the one or more accessory mounts may include one or more holes for accepting a screw or bolt for fastening onto helmet **200**. In some embodiments the one or more holes, if present on the one or more accessory mounts, may be positioned to align with preexisting holes in a helmet (e.g., positioned to align with bolt **12** of helmet **10** of FIG. **1**) such that no additional holes need to be made in the helmet.

[0029] In some embodiments, the one or more accessory mounts include hook or loop patches. As shown in FIGS. **2-9**, for example, in some embodiments, helmet cover assembly **100** may include one or more hook or loop patches (e.g., VELCRO® fasteners) which may be attached (e.g., sewn, glued, etc.) onto the exterior of cover **110**. The hook or loop patches may be configured to fasten onto additional items having opposing loops or hooks to allow attachment of onto cover **110**. For example, as shown in the illustrated embodiments, helmet cover assembly **100** may include hook or loop patches **160***a*, **160***b*, **160***c*, and **160***d* which are positioned at different areas of cover **110**. In some embodiments, patch **160***a* is positioned centrally along the top of cover **110**, patch **160***b* is positioned along the left side of cover **110**, patch **160***c* is positioned along the right side of cover **110**, and patch **160***d* is positioned at the rear of cover **110** as shown. It should be understood that more or fewer hook and loop patches may be included according to other embodiments, or that their particular arrangement need not be limited to the arrangement shown in the figures. Furthermore, while patches **160***a*, **160***b*, **160***c*, and **160***d* are illustrated as being generally rectangular in shape, it should be also understood that any other shapes are also possible.

[0030] In some embodiments, the one or more accessory mounts may include, for example, a mounting rail such as Accessory Rail Connector (ARC) or Picatinny rail, and other mounts such as brackets for mounting night vision goggles (NVG) or other equipment. These accessory mounts may be included in the helmet cover assembly **100** in addition to the hook or loop patches (e.g., patches **160***a*, **160***b*, **160***c*, **160***d*). The one or more accessory mounts may be made from a substantially rigid plastic material and may be curved or shaped to generally match a contour of exterior surface **210** of helmet **200**. As shown in FIGS. **3-10**, cover assembly **100** may include at least left mounting rail **120**, right mounting rail **130**, and/or shroud **140** which are configured to receive the various accessory devices. For example, except for how they are attached, in some embodiments left and right mounting rails **120** and **130** may have similar configurations to the mounting rails shown and described in U.S. Pat. No. 7,908,667, U.S. Pat. No. 8,028,344, and International Application Publication No. WO 2013/192070, which are incorporated herein by reference in their entirety.

[0031] As particularly shown in FIGS. **3**, **4**, **6**, and **8**, left mounting rail **120**, left mounting rail **120** may include a recessed groove **122** that slidably accepts an accessory device having an engagement member complementary to recessed groove **122**. In some embodiments, recessed groove **122** is a dovetail recessed groove to forms a dovetail sliding joint with an accessory device received therein. Right mounting rail **130** may be similarly configured as left mounting rail **120**. For example, as shown in FIGS. **7** and **8**, right mounting rail **130** may be generally symmetrical with left mounting rail **120** and include a recessed groove **132** that slidably accepts an accessory device therein. As with recessed groove **122** of left mounting rail **120**, recessed groove **132** may be a dovetail recessed groove to form a dovetail sliding joint with an accessory device received therein. In some embodiments, left and/or right mounting rails **120** and **130** do not include any holes configured to receive screws, bolts, or other similar fasteners for mounting directly onto helmet **200**. In other embodiments, left and/or right mounting rails **120** and **130** include one or more holes for receiving screws, bolts, or other similar fasteners, the one or more holes preferably being positioned to align with preexisting holes on helmet **200** (e.g., bolt holes that may be used to attach chin straps or other retention systems). Left and right mounting rails **120** and **130** may be positioned opposite each other on the exterior of cover **110** such that, when cover **110** is mounted onto helmet **200**, the left and right mounting rails **120** and **130** are positioned along the left and right sides of helmet **200**, respectively. In some embodiments, for example, left mounting rail **120** may be attached to left panel **114** of cover **110** and right mounting rail may be attached to right panel **116** of cover **110**. In these positions, left and right mounting rails **120** and **130** may be particularly suited for mounting accessory devices including, but not limited to, earphones, headsets, hinges for face shields and visors, side lights, and other devices that may be preferably mounted on one or both sides of a helmet. In some embodiments of helmet cover assembly **100**, left and/or right mounting rails **120** and **130** do not directly contact helmet **200**

when helmet cover assembly **100** is mounted onto helmet **200**. In some embodiments, cover **110** is sandwiched between exterior surface **210** and left and/or right mounting rails **120** and **130** during use. In other embodiments, cover **110** may include cutouts (not shown) that allow direct contact or access between left and/or right mounting rails **120** and **130** with exterior surface **210** of helmet **200** during use. Such cutouts, for example, may provide clearance for screws, bolts, or other similar fasteners, if present, for mounting and left and/or right mounting rails **120** and **130** directly onto helmet **200**.

[0032] Shroud **140**, as depicted in FIGS. **2-7**, **9**, and **10**, may be positioned centrally at the front of helmet cover assembly **100**. In some embodiments, shroud **140** is attached to a front exterior portion of cover **110**. In some embodiments, for example, shroud **140** may be attached to central panel **112** of cover **110**. As best shown in FIGS. **3**, **5**, and **9**, in some embodiments, shroud **140** includes a recessed portion **142** configured to couple with at least one accessory device. The at least one accessory device that may be removably mounted onto shroud **140** includes, but is not limited to, night vision goggles, cameras, lamps, other optical equipment, communication devices, displays, masks or visors, and other equipment that are preferably mounted at the front of a helmet. In some embodiments, shroud **140** does not directly contact helmet **200** when helmet cover assembly **100** is mounted onto helmet **200**. In some embodiments, cover **110** is sandwiched between exterior surface **210** and shroud **140** during use. In some embodiments, shroud **140** lacks any holes for receiving screws or bolts. In other embodiments, shroud **140** includes one or more holes (e.g., hole **146**) for receiving a screw or bolt that can be used to help secure shroud **140** to helmet **200** during use. In some embodiments, cover **110** includes a cutout or window through which the screw or bolt may extend through. The cutout, if present, may be positioned between shroud **140** and the exterior surface **210** of helmet **200** during use according to some embodiments. In some embodiments, the cutout allows direct contact or access between shroud **140** and exterior surface **210** of helmet **200** during use. In some embodiments, shroud **140** includes a rubber gasket that may be attached to the perimeter of the back surface of shroud **140** that faces toward helmet **200**.

[0033] According to certain preferred embodiments, the one or more accessory mounts (e.g., left mounting rail **120**, right mounting rail **130**, shroud **140**) are attached to cover **110** using a plurality of straps. In some embodiments, the one or more accessory mounts are only attached to cover **110** using the plurality of straps. In some embodiments, the one or more accessory mounts are attached to each other using the plurality of straps. The plurality of straps are preferably a webbing material (e.g., nylon webbing), though other similar materials may also be suitable. In some embodiments, the straps are flexible but not elastic. In some embodiments, the straps do not substantially stretch. In alternative embodiments, the straps may be elastic. In some embodiments, each strap may have a width of up to one inch (25.4 mm). In some embodiments, each strap may have a width of about 10 mm to about 26 mm. In some embodiments, each strap may have a width of about 11 mm to about 26 mm. In some embodiments, each strap may have a width of about 12 mm to about 26 mm. In some embodiments, each strap may have a width of about 13 mm to about 26 mm. In some embodiments, each strap may have a width of about 14 mm to about 26 mm. In some embodiments, each strap may have a width of about 15 mm to about 26 mm. In some embodiments, each strap may have a width of about 16 mm to about 26 mm. In some embodiments, each strap may have a width of about 17 mm to about 26 mm. In some embodiments, each strap may have a width of about 18 mm to about 26 mm. In some embodiments, each strap may have a width of about 19 mm to about 26 mm. In some embodiments, each strap may have a width of about 20 mm to about 26 mm. In some embodiments, each strap may have a width of about 21 mm to about 26 mm. In some embodiments, each strap may have a width of about 22 mm to about 26 mm. In some embodiments, each strap may have a width of about 23 mm to about 26 mm. In some embodiments, each strap may have a width of about 24 mm to about 26 mm. In some embodiments, each strap may have a width of about 25 mm to about 26 mm. In some embodiments, each strap may have a width of at least 10 mm, at least 11 mm, at least 12 mm, at least 13 mm, at least 14 mm, at least 15 mm, at least 16 mm, at least 17 mm, at least 18 mm, at least 19 mm, at least 20 mm, at least 21 mm, at least 22 mm, at least 23 mm, at least 24 mm, at least 25 mm, or at least 25 mm. In some embodiments, each strap may have a width of less than 26 mm, less than 25 mm, less than 24 mm, less than 23 mm, less than 22 mm, less than 21 mm, less than 20 mm, less than 19 mm, less than 18 mm, less than 17 mm, less than 16 mm, less than 15 mm, less than 14 mm, less than 13 mm, less than 12 mm, less than 11 mm, or less than 10 mm. Each strap may have substantially the same width, or the straps may have different widths.

[0034] Referring again to FIGS. **2**, **3**, and **5-7**, helmet cover assembly **100** in certain embodiments includes front straps **150***a* and **150***b* which are used to connect left mounting rail **120**, right mounting rail **130**, and shroud **140** to cover **110**. In some embodiments, front straps **150***a* and **150***b* connect mounting rail **120** and right mounting rail **130** to shroud **140**. In some embodiments, each of front straps **150***a* and **150***b* is a fixed length strap. As shown in FIGS. **3** and **5**, in some embodiments, shroud **140** is connected to front portions of left mounting rail **120** and right mounting rail **130** by front straps **150***a* and **150***b*, respectively. In some such embodiments, a first end of front strap **150***a* is secured to the front portion of left mounting rail **120** while the second end of front strap **150***a* is secured to shroud **140**. Similarly, a first end of front strap **150***b* is secured to the front portion of right mounting rail **130** while the second end of front strap **150***b* is secured to shroud **140**. The ends of front straps **150***a* and **150***b* may be secured to left/right mounting rails **120**/**130** and shroud **140** using any means known in the art. In other embodiments, each of front straps **150***a* and **150***b* may be formed into a loop. In some embodiments, left and right mounting rails **120** and **130** and shroud **140** include slots through which front straps **150***a* and **150***b* may be looped or anchored. As shown in FIGS. **3-7**, front strap **150***a* may pass through slot **124***a* at a front portion of left mounting rail **120** and slot **144***a* of shroud **140** while front strap **150***b* may pass through slot **134***a* a front portion of right mounting rail **130** and slot **144***b* of shroud **140**. The slots **124***a*, **134***a*, **144***a*, and **144***b* may have approximately the same or slightly larger width than the width of front straps **150***a* and **150***b*.

[0035] In some embodiments, a portion of front straps **150***a* and **150***b* passes beneath the exterior of cover **110** (as shown in dashed lines) such that the portion of front straps **150***a* and **150***b* is positioned between the exterior of cover **110** and exterior surface **210** of helmet **200** during use. In some embodiments, cover **110** is provided with slits through which front straps **150***a* and **150***b* may extend. In some embodiments, cover **110** is provided with one or more pairs of slits for

each of front straps **150***a* and **150***b*. The slits may be positioned adjacent to the accessory mounts (e.g., left mounting rail **120**, right mounting rail **130**, shroud **140**) according to some embodiments. For example, front strap **150***a* may pass through a first slit on left panel **114** positioned by slot **124***a* and a second slit on central panel **112** positioned by slot **144***a*. Similarly, front strap **150***b* may pass through a first slit on right panel **116** positioned by slot **134***a* and a second slit on central panel **112** positioned by slot **144***b*. In some embodiments, a majority of front straps **150***a* and **150***b* extends beneath the exterior of cover **110**. This can, for example, reduce that chance that front straps **150***a* and **150***b* will snag on objects. Moreover, by weaving front straps **150***a* and **150***b* through the slits of cover **110**, this allows for cover **110** to be secured onto front straps **150***a* and **150***b*. As discussed cover **110** may include one or more prefabricated slits, cutouts, or other openings for receiving straps and accessory mounts. Such openings may have a sewn or otherwise reinforced edge to prevent fraying of cover **110** around the periphery of the opening.

[0036] In some embodiments, helmet cover assembly includes a central strap **152**. In some embodiments, central strap **152** connects left mounting rail **120** with right mounting rail **130**. In some embodiments, central strap **152** is a fixed length strap. In some embodiments, central strap **152** extends from a central portion of left mounting rail **120** to a central portion of right mounting rail **130** as shown, for example, in FIG. **9**. In some embodiments, central strap **152** is positioned such that central strap **152** passes over the top of helmet **200** when helmet cover assembly **100** is mounted onto helmet **200**. In some embodiments, central strap **152** may help provide vertical stability to left mounting rail **120** with right mounting rail **130** during use. In some embodiments, a first end of central strap **152** is secured to the central portion of left mounting rail **120** while the second end of front strap **152** is secured to the central portion of right mounting rail **130**. The ends of central strap **152** may be secured to left and right mounting rails **120** and **130** using any means known in the art. In some embodiments, left and right mounting rails **120** and **130** include slots through which central strap **152** may be looped or anchored. As shown in FIGS. **6**, **7**, and **9**, in some embodiments, central strap **152** may pass through slot **124***b* at a top central portion of left mounting rail **120** and slot **134***b* at a top central portion of right mounting rail **130**. The slots **124***b* and **134***b* may have approximately the same or slightly larger width than the width central strap **152**. Central strap **152** may have the same or different width as front strap **150***a* and/or **150***b*.

[0037] In some embodiments, a portion of central strap **152** passes beneath the exterior of cover **110** (as shown in dashed lines) such that the portion of central strap **152** is positioned between the exterior of cover **110** and exterior surface **210** of helmet **200** during use. In some embodiments, cover **110** is provided with slits through which central strap **152** may extend. In some embodiments, cover **110** is provided with one or more pairs of slits through which central strap **152** may extend. The slits may be positioned adjacent to the accessory mounts (e.g., left mounting rail **120**, right mounting rail **130**) according to some embodiments. For example, central strap **152** may pass through a first slit on left panel **114** positioned by slot **124***b* and a second slit on right panel **116** positioned by slot **134***b*. In some embodiments, a majority of central strap **152** extends beneath the exterior of cover **110**. This can, for example, reduce that chance that central strap **152** will snag on objects. Moreover, by weaving central strap **152** through the slits of cover **110**, this allows for cover **110** to be secured onto central strap **152**. In further embodiments, as shown in FIG. **9**, cover **110** may include a loop **113** positioned on the interior of cover **110** through which central strap **152** may pass. For example, loop **113** may be positioned on an interior side of central panel **112**. In some embodiments loop **113** is configured to prevent central strap **152** from substantially shifting forward or backward during use. Loop **113** may also assist in attaching cover **110** to central strap **152**.

[0038] In further embodiments, as shown in FIGS. **4** and **9**, helmet cover assembly **100** includes a rear strap **154**. In some embodiments, rear strap **154** connects left mounting rail **120** with right mounting rail **130**. In some embodiments, rear strap **154** extends from a rear portion of right mounting rail **130** to a rear portion of left mounting rail **120** as shown, for example, in FIG. **8**. In some embodiments, rear strap **154** is positioned such that rear strap **154** passes along the rear of helmet **200** when helmet cover assembly **100** is mounted onto helmet **200**. In some embodiments, left and right mounting rails **120** and **130** include slots through which rear strap may be looped or anchored. As shown in FIGS. **6-8**, in some embodiments, rear strap **154** may pass through slot **124***c* at a rear portion of left mounting rail **120** and slot **134***c* at a rear portion of right mounting rail **130**. The slots **124***c* and **134***c* may have approximately the same or slightly larger width than the width rear strap **154**. Rear strap **154** may have the same or different width as front straps **150***a* and **150***b* or central strap **152**.

[0039] In some embodiments, a portion of rear strap **154** passes beneath the exterior of cover **110** (as shown in dashed lines) such that the portion of rear strap **154** is positioned between the exterior of cover **110** and exterior surface **210** of helmet **200** during use. In some embodiments, cover **110** is provided with slits through which rear strap **154** may extend. In some embodiments, cover **110** is provided with one or more pairs of slits through which rear strap **154** may extend. The slits may be positioned adjacent to the accessory mounts (e.g., left mounting rail **120**, right mounting rail **130**) according to some embodiments. For example, rear strap **154** may pass through a first slit on by slot **134***c* and a second slit positioned by slot **124***c*. This can, for example, reduce that chance that central strap **152** will snag on objects. Moreover, by weaving rear strap **154** through the slits of cover **110**, this allows for cover **110** to be secured onto rear strap **154**.

[0040] In some embodiments, rear strap **154** may be configured to allow for adjustment of the tightness of helmet cover assembly **100** around helmet **200**. In some embodiments, rear strap **154** is an adjustable length strap. As shown in FIG. **8**, for example, in some embodiments, rear strap **154** extends from slot **134***c* of right mounting rail **130** to underneath cover **110** through a first slit in cover **110** proximate slot **134***c*. Rear strap **154** may then extend from underneath cover **110** through a second slit in cover **110** proximate slot **124***c* to left mounting rail **120**. Rear strap **154** may be looped through slot **124***c* and terminate in an end tab **154***a*. It should be understood that a mirror image arrangement is also possible in other embodiments. In some embodiments, end tab **154***a* which may be pulled (e.g., in the direction shown by the arrow) to tighten helmet cover assembly **100** around helmet **200**. In some embodiments, pulling end tab **154***a* causes components of helmet cover assembly **100** to cinch closer together. In particular, pulling end tab **154***b* may cause the rear portions of left mounting rail **120** and right mounting rail

130 to move closer together, causing helmet cover assembly 100 to tighten around helmet 200 during use. In certain embodiments, helmet cover assembly 100 is preferably tightened such that helmet cover assembly 100 is substantially fixed onto helmet 200. In some embodiments, rear strap 154 may allow the user to tighten helmet cover assembly 100 without removing helmet cover assembly from helmet 200 or without first removing helmet 200 from his or her head. Preferably, in certain embodiments, rear strap 154 allows for single-handed tightening of helmet cover assembly 100.

[0041] In some embodiments, moving end tab 154*a* in an opposite direction may allow helmet cover assembly to be loosened around helmet 200 (e.g., when it is desired to remove helmet cover assembly 100 from helmet 200). In some embodiments, end tab 154*a* is provided with loops or hooks configured to fasten onto hook or loop patch 160*d*. In some such embodiments, end tab 154*a* may be fastened onto hook or loop patch 160*d* once the desired tightening has been achieved to prevent loosening of helmet cover assembly 100. In further embodiments, helmet cover assembly 100 may further include a removable outer patch or flap (not shown) which may be positioned over end tab 154*a*. For example, end tab 154*a* may be sandwiched between hook or loop patch 160*d* and the outer patch or flap. Such an outer patch or flap, in some embodiments, may help prevent inadvertent detachment of end tab 154*a* from hook or loop patch 160*d* and loosening of helmet cover assembly 100. The outer patch or flap may include hooks or loops configured to fasten onto hook or loop patch 160*d*.

[0042] In some embodiments, helmet cover assembly 100 may additionally or alternatively include a cabling system configured to connect together the one or more accessory mounts (e.g., left mounting rail 120, right mounting rail 130, shroud 140). In some such embodiments, the cabling system includes a cable or cord that is connected to each of left mounting rail 120, right mounting rail 130, and shroud 140 and which may be tightened to cinch left mounting rail 120, right mounting rail 130, and shroud 140 together. In some embodiments, the cable or cord is looped between left mounting rail 120 and right mounting rail 130 and/or shroud 140. In some embodiments, the cable or cord is crisscrossed between left mounting rail 120 and right mounting rail 130. In some embodiments, the cable or cord is a nylon cable. In some embodiments, the cable or cord is woven into cover 110. In some embodiments, the cable or cord is configured to be at least partially positioned between cover 110 and exterior surface 210 of helmet 200 during use. In some embodiments, the cable or cord is directly connected to left mounting rail 120, right mounting rail 130, and/or shroud 140. In other embodiments, the cable or cord is connected to one or more straps that are attached to left mounting rail 120, right mounting rail 130, and/or shroud 140. In further embodiments, the cabling system includes a tightening strap that when pulled, applies tension to the cable or cord to tighten the cabling system.

[0043] In some embodiments, helmet cover assembly 100 may further be secured to helmet 200 by one or more components which extend into the interior of helmet 200 during use. In some embodiments, at least a portion of cover 110 is configured to extend into the interior of helmet 200. In some embodiments, cover 110 includes one or more flaps that extend into the interior of helmet 200 to help secure helmet cover assembly 110 to helmet 200. As shown in FIG. 10, for example, helmet cover assembly 100 may include at least a left flap 118*a* and a right flap 118*b* that extends into the interior of helmet 200 when helmet cover assembly 100 is mounted onto helmet 200. Other flaps positioned, for example, at the front or rear of cover 110, may also be included according to other embodiments. In some embodiments, left flap 118*a* and right flap 118*b* may respectively include hook or loop patches 119*a* and 119*b* that are positioned and configured to fasten onto one or more hook or loop patches 240 (e.g., VELCOIN® fasteners) that may be positioned throughout interior surface 230 of helmet 200. Other attachment means for securing the flaps to interior surface 230 of helmet 200 may also be used according to other embodiments. For example, in some embodiments, snap buttons or other mechanical fasteners can be used to the flaps to interior surface 230 of helmet 200.

[0044] In yet further embodiments, helmet cover assembly 100 may include one or more fastening straps which are configured to extend into the interior of helmet 200 during use. The one or more fastening straps may be made of the same materials and have the widths described for the other straps present in helmet cover assembly 100 (e.g., front straps 150*a* and 150*b*). In some embodiments, the one or more fastening straps are configured to extend from an accessory mount into the interior of helmet 200. As shown in the illustrated embodiments of FIGS. 2-10, helmet cover assembly 100 may include at least four fastening straps which include two front fastening straps 156*a* and 156*b* and two rear fastening straps 158*a* and 158*b*. In some embodiments, front fastening strap 156*a* may extend from a front portion of left mounting rail 120 (e.g., at slot 124*d*), front fastening strap 156*b* may extend from a front portion of right mounting rail 130 (e.g., at slot 134*d*), rear fastening strap 158*a* may extend from a rear portion of left mounting rail 120 (e.g., at slot 124*e*), and rear fastening strap 158*b* may extend from a rear portion of right mounting rail 130 (e.g., at slot 134*e*). Each of front and rear fastening straps 156*a*, 156*b*, 158*a*, and 158*b*, are sized to be able to extend over peripheral edge 220 of helmet 200 into the interior of helmet 200. As shown in FIG. 10, in some embodiments, front fastening straps 156*a* and 156*b* can include end portions 157*a* and 157*b*, respectively, which may have hook or loop portions configured to attach to one or more hook or loop patches 240 positioned on interior surface 230 of helmet 200. Similarly, rear fastening straps 158*a* and 158*b* may be provided with end portions 159*a* and 159*b*, respectively, which may have hook or loop portions that are also configured to attach to one or more hook or loop patches 240. It should be understood that additional fastening straps having similar configurations may also be included in helmet cover assembly 100 which may extend, for example, from shroud 140 or cover 110 according to further embodiments.

[0045] In further embodiments, helmet 200 may include a helmet liner which may be placed in the interior of helmet 200. The helmet liner may be sized and shaped to fit between interior surface 230 of helmet 200 and the user's head during use to provide additional protection, shock absorption, and/or cushioning. In some embodiments, the helmet liner may be made from or include a foam material, for example, expanded polypropylene, expanded polystyrene, open or closed cell polyurethane, etc. In some embodiments, the helmet liner includes a plurality of foam pads that may be positioned at different locations within the interior of helmet 200. A non-limiting example of a helmet liner is described in U.S. Pat. No. 7,958,573, which is incorporated herein by reference in

its entirety. In some embodiments, the helmet liner may be positioned within the interior of helmet **200** such that one or more of the fastening straps (e.g., **156***a*, **156***b*, **158***a*, and/or **158***b*) are sandwiched between the helmet liner and interior surface **230** of helmet **200**. The helmet liner may be removably attached to helmet **200** by way of hook or loop patches **240**. In other embodiments, it may be possible to attach one or more of the fastening straps (e.g., **156***a*, **156***b*, **158***a*, and/or **158***b*) directly to the helmet liner. For example, the helmet liner may be provided with hook or loop patches that can attach to end portions **157***a*, **157***b*, **159***a*, and/or **159***b*. In some such embodiments, the helmet liner is attached to the interior surface **230** of helmet **200** (e.g., via hook or loop patches **240**), and end portions **157***a*, **157***b*, **159***a*, and/or **159***b* of fastening straps **156***a*, **156***b*, **158***a*, and/or **158***b* are attached directly to the helmet liner. One exemplary embodiment is depicted in FIG. **12** where helmet **200** is provided with a helmet liner **300** having a plurality of removable pads **340**, **350**, **360**. According to this embodiment, end portions **157***a*, **157***b*, **159***a*, and/or **159***b* may be attached to the helmet liner **300** and sandwiched between the helmet liner **300** and one or more of removable pads **340**, **350**, **360**.

[0046] FIG. **11** shows attachment of front and rear fastening straps **156***a*, **156***b*, **158***a*, and **158***b* according to a further embodiment of the present invention. In this embodiment, front and rear fastening straps **156***a*, **156***b*, **158***a*, and **158***b* may be attached to a helmet retention system **170** that may be included with helmet **200**. Helmet retention system **170** is configured to retain helmet **200** on the user's head during use and may include, for example, a chin strap and/or nape pad **176**. An example helmet retention system that may be used with helmet **200** is described in U.S. Pat. No. 8,353,066, which is incorporated by reference in its entirety. In general, helmet retention system **170** includes a plurality of straps such as forward straps **172***a* and **172***b* that may be mounted at the front of helmet **200** and back straps **174***a* and **174***b* that may be mounted at the rear of helmet **200**. In some embodiments, forward straps **172***a* and **172***b* and back straps **174***a* and **174***b* may be directly attached onto helmet **200** (e.g., similar to retention system **14** of FIG. **1**). In other embodiments, forward straps **172***a* and **172***b* and back straps **174***a* and **174***b* may be mounted onto a helmet liner (as described above) that in turn may be removably attached to the interior of helmet **200** (see FIG. **12** for example). In the illustrated embodiment of FIG. **11**, one or more straps of helmet retention system **170** are connected to one or more of front and rear fastening straps **156***a*, **156***b*, **158***a*, and **158***b* of helmet cover assembly **100**. In some embodiments, front fastening straps **156***a* and **156***b* may be connected to forward straps **172***a* and **172***b*, respectively. In some embodiments, front fastening straps **156***a* and **156***b* may be connected to forward straps **172***a* and **172***b* at buckles or rings **173***a* and **173***b*. For example, each of forward strap **172***a* and front fastening strap **156***a* may pass through or loop around buckle or ring **173***a*. Similarly, each of forward strap **172***b* and front fastening strap **156***b* may pass through or loop around buckle or ring **173***b*. In some embodiments, front fastening straps **156***a* and **156***b* are contiguous with forward straps **172***a* and **172***b*, respectively. In some embodiments, rear fastening straps **158***a* and **158***b* may be connected to back straps **174***a* and **174***b*, respectively. In some embodiments, rear fastening straps **158***a* and **158***b* may be connected to back straps **174***a* and **174***b* at buckles or rings **175***a* and **175***b*. For example, each of back strap **174***a* and rear fastening strap **158***a* may pass through or loop around buckle or ring **175***a*. Similarly, each of back strap **174***b* and rear fastening strap **158***b* may pass through or loop around buckle or ring **175***b*. In some embodiments, rear fastening straps **158***a* and **158***b* are contiguous with back straps **174***a* and **174***b*, respectively. Connecting one or more straps of helmet retention system **170** to one or more of front and rear fastening straps **156***a*, **156***b*, **158***a*, and **158***b* in certain embodiments allows helmet retention system **170** to be coupled to the accessory mounts (e.g., left and/or right mounting rails **120** and **130**) of helmet cover assembly **100**.

[0047] It will be appreciated by those skilled in the art that changes could be made to the exemplary embodiments shown and described above without departing from the broad inventive concept thereof. It is understood, therefore, that this invention is not limited to the exemplary embodiments shown and described, but it is intended to cover modifications within the spirit and scope of the present invention as defined by the claims. For example, specific features of the exemplary embodiments may or may not be part of the claimed invention and features of the disclosed embodiments may be combined. Unless specifically set forth herein, the terms "a", "an" and "the" are not limited to one element but instead should be read as meaning "at least one".

[0048] It is to be understood that at least some of the figures and descriptions of the invention have been simplified to focus on elements that are relevant for a clear understanding of the invention, while eliminating, for purposes of clarity, other elements that those of ordinary skill in the art will appreciate may also comprise a portion of the invention. However, because such elements are well known in the art, and because they do not necessarily facilitate a better understanding of the invention, a description of such elements is not provided herein.

I/we claim:

1. A helmet cover assembly comprising:

a cover configured to extend over a helmet;

at least one mounting device coupled to the cover; and

one or more straps coupled to the at least one mounting device and configured to tighten the cover to the helmet.

2. The helmet cover assembly of claim **1**, wherein the at least one mounting device includes at least two mounting devices and the one or more straps are coupled between the at least two mounting devices, wherein the one or more straps are configured to pull the at least two mounting devices together and tighten the cover to the helmet.

3. The helmet cover assembly of claim **2**, wherein the at least two mounting devices are coupled to one another by one or more fixed length straps.

4. The helmet cover assembly of claim **2**, wherein the at least two mounting devices are coupled to the cover only through the use of the one or more straps.

5. The helmet cover assembly of claim **1** further comprising a helmet retention system configured to retain the helmet to a user's head, the helmet retention system being coupled to the cover through the use of one or more straps.

6. The helmet cover assembly of claim **5**, wherein at least one of the one or more straps is coupled to the at least one mounting device and configured to couple to an inner surface of the helmet.

7. The helmet cover assembly of claim **1**, wherein the at least one mounting device includes a first rail, a second rail, and a shroud, the first rail being coupled to the second rail by an adjustable strap configured to pull the first rail and the

second rail together to tighten the cover to the helmet, the first rail being coupled to the second rail by a first fixed length strap, and the shroud being coupled to the first rail by a second fixed length strap and coupled to the second rail by a third fixed length strap.

8. The helmet cover assembly of claim **1**, wherein one of the at least one mounting device includes a bolt configured to be coupled to the helmet through a bolt hole in the helmet.

9. The helmet cover assembly of claim **1**, wherein the cover includes a window receiving the at least one mounting device and configured to allow the at least one mounting device to directly contact an outer surface of the helmet.

10. The helmet cover assembly of claim **1**, wherein the cover extends over an entire outer surface of the helmet.

11. The helmet cover assembly of claim **1**, wherein the cover extends over a peripheral edge of the helmet and is attachable to the helmet using only the one or more straps and one or more hook and loop fasteners.

12. The helmet cover assembly of claim **1**, wherein the cover extends over a peripheral edge of the helmet and is attachable to a liner of the helmet using only the one or more straps and one or more hook and loop fasteners.

13. The helmet cover assembly of claim **1**, wherein the cover is comprised of a non-elastic material.

14. A helmet cover assembly comprising:

a cover configured to extend over a helmet;

a first mounting device coupled to a first lateral side of the cover;

a second mounting device coupled to a second lateral side of the cover; and

an adjustable length strap coupled to the first mounting device and the second mounting device and configured to adjust the distance between the first mounting device and the second mounting device.

15. A helmet cover assembly comprising:

a cover configured to extend substantially over an entire outer surface of a helmet, the cover including a plurality of hook and loop fasteners configured to attached to corresponding hook and loop fasteners on an inner surface of the helmet;

a first mounting rail coupled to a first lateral side of the cover;

a second mounting rail coupled to a second lateral side of the cover;

a fixed length strap extending between the first mounting rail and the second mounting rail, the cover extending at least partially over at least a portion of the fixed length strap;

an adjustable length strap coupled to the first mounting device and the second mounting device and configured to adjust the distance between the first mounting device and the second mounting device; and

a retention system coupled to the first mounting device and the second mounting device.

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