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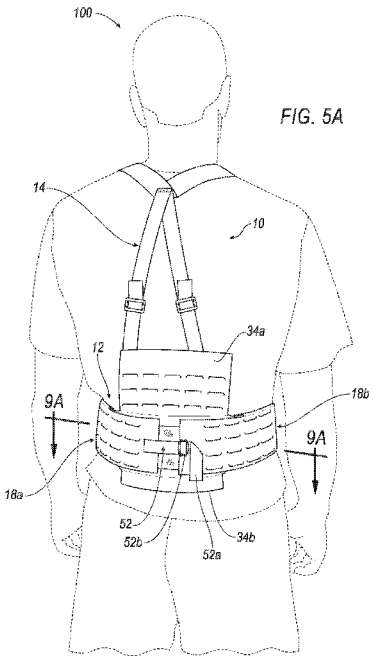

FIG. 5A

(57) Abstract: An adjustable ballistic garment (10, 10a) includes a main body (16, 16a), a pair of extensions (18a-18d), and a shoulder harness (14). The main body (16, 16a) includes a central panel (22a) and a pair of wings (22b) extending laterally outwardly from the central panel (22a). The central panel (22a) and the wings (22b) are integrally formed from a single piece of a first material. The central panel (22a) may include a layer (23) of a ballistic material disposed on a first side thereof. A first extension (18a, 18c) and a second extension (18b, 18d) each have a first side (42) and a second side (44) cooperating to define a conduit (44) for receiving one of the wings (22b) of the main body (16, 16a). At least one of the first side (42) and the second side (44) includes a ballistic material. A shoulder harness (14) is attached to at least one of the main body (16, 16a), the first extension (18a, 18c), and the second extension (18b, 18d).

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Adjustable Ballistic Garment

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority under 35 U.S.C. §119(e) to U.S. Provisional Application 62/587,813, filed on November 17, 2017. The disclosure of which is considered part of the disclosure of this application and is hereby incorporated by reference in its entirety.

TECHNICAL FIELD

[0002] This disclosure relates to protective ballistic garments. More specifically, this disclosure relates to a protective ballistic belt that is adjustable.

BACKGROUND

[0003] A protective, or ballistic, belt is typically formed with a rear ballistic panel portion and a pair of side ballistic portions extending from the rear ballistic panel and around the waist of a user. The rear ballistic panel and the side ballistic portions are often supported on an adjustable strap. Protective belts are conventionally concealed beneath the user's uniform or worn over top of the user's uniform, but present a separate article of clothing from the user's uniform.

[0004] In the field, adjustability of the ballistic belt is a priority for accommodating users of various sizes. Adjusting a size of the belt, however, generally requires that the strap of the belt be extended or retracted to ensure a secure fit of the belt on the waist of the user. However, adjustment of the size of the belt — especially when the size of the belt is increased — often results in portions user's waist being exposed, as the side ballistic portions do not extend to accommodate the extended strap.

SUMMARY

[0005] In one aspect of the disclosure, an adjustable ballistic belt includes a main body and at least one extension. The main body includes a central panel and a wing extending laterally from the central panel. The panel and the wing are formed of a first material, and the panel includes a first ballistic material. The extension includes a second

ballistic material defining a conduit. A portion of the wing of the main body is slideably received in the conduit of the extension.

[0006] Implementations of the disclosure may include one or more of the following optional features. In some implementations, the extension includes a first side and a second side opposing the first side. The conduit is defined between the first side and the second side. Here, the second side may include a MOLLE-compatible webbed fabric. In some examples, the first side extends beyond the second side at a first end of the extension and the second side extends beyond the first side at a second end of the extension. In some examples, the second end of the extension overlaps the central panel of the main body.

[0007] In some implementations, the central panel includes a layer of the first ballistic material disposed on a first surface thereof. Here, the central panel may include a first fastener disposed on a second surface thereof, the second surface being on an opposite side of the central panel from the first surface. In some examples, a first end of the extension includes a second fastener configured to cooperate with the first fastener to secure the extension to the main body.

[0008] In some implementations, the garment includes shoulder strap having a first end attached to one of the main body and the extension and a second end attached to the other of the main body and the extension.

[0009] In some examples, the central panel and the wing are integrally formed of a single piece of material. In some implementations, the first ballistic material and second ballistic material are fabricated from the same type of ballistic material.

[0010] In another aspect of the disclosure, an adjustable garment includes a main body having a central panel and a pair of wings extending laterally outwardly from opposing sides of the central panel. The garment further includes a first extension and a second extension. The first extension has a first ballistic panel and is slideably received on a first one of the wings of the main body. The second extension has a second ballistic panel and is slideably received on a second one of the wings of the main body.

[0011] Implementations of the disclosure may include one or more of the following optional features. In some implementations, the central panel and the wings are integrally formed from a piece of a first ballistic material. Here, the central panel further

comprises a third ballistic panel disposed on a surface thereof. In some examples, the garment is positionable in a first position, wherein the first ballistic panel of the first extension and the second ballistic panel of the second extension are disposed adjacent to the third ballistic panel of the central panel, and a second position, wherein the first ballistic panel of the first extension and the second ballistic panel of the second extension are spaced apart from the third ballistic panel of the central panel. Here, the first ballistic panel, the second ballistic panel, and the third ballistic panel may be formed of a soft ballistic material.

[0012] In some examples, the first extension includes a first proximal side and a first distal side defining a first conduit, and the second extension includes a second proximal side and a second distal side defining a second conduit. Here, a first one of the wings is received in the first conduit and a second one of the wings is received in the second conduit. The first distal side defines a first pocket having a first ballistic panel disposed therein and the second distal side defines a second pocket having a second ballistic panel disposed there.

[0013] In some implementations, each of the first extension and the second extension includes a fastener configured to cooperate with a fastener of the central panel to secure respective positions of the first extension and the second extension.

[0014] In another aspect of the disclosure, an adjustable ballistic garment includes a main body having a central panel and a pair of wings extending laterally outwardly from the central panel. The central panel and the wings are integrally formed from a single piece of a first material, the central panel including a first ballistic material disposed on a first side thereof. The adjustable ballistic garment further includes a first extension and a second extension each having a first side and a second side cooperating to define a conduit for receiving one of the wings of the main body. At least one of the first side and the second side includes a second ballistic material. A shoulder harness is attached to at least one of the main body, the first extension, and the second extension.

[0015] In another example of the disclosure, an adjustable ballistic garment, includes a main body including a first ballistic material and at least one extension including a second ballistic material, wherein at least a portion of the first and second ballistic

materials overlap one another and the at least one extension is adjustably coupled to main body.

[0016] In some examples, the at least one extension is operable between a first position wherein the first ballistic material overlaps the second ballistic material by a first distance and a second position wherein the first ballistic material overlaps the second ballistic material by a second distance, wherein the first and second distances are different from one another.

[0017] In some examples, the extension includes a conduit for at least partially receiving the main body.

[0018] In some implementations, the second ballistic panel is at least partially disposed within a pocket of the extension.

[0019] In some examples, the adjustable ballistic garment further comprises a shoulder harness attached to at least one of the main body and the at least one extension.

[0020] In some implementations, the at least one extension includes a first extension and a second extension.

[0021] In some examples, the first and second ballistic material are fabricated from the same type of ballistic material.

[0022] The details of one or more implementations of the disclosure are set forth in the accompanying drawings and the description below. Other aspects, features, and advantages will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

[0023] FIG. 1A is a front perspective of a ballistic garment according to the instant disclosure.

[0024] FIG. 1B is a back perspective of the ballistic garment of FIG. 1A.

[0025] FIG. 2 is an exploded view of the ballistic garment of FIG. 1A.

[0026] FIGS. 3A and 3B are front and rear elevation views of a first extension of the ballistic garment of FIG. 1A.

[0027] FIGS. 3C and 3D are front and rear elevation views of a second extension of the ballistic garment of FIG. 1A.

[0028] FIGS. 3E and 3F are front and rear perspective views of the second extension of FIGS. 3C and 3D.

[0029] FIGS. 4A–4F are rear elevation views of the ballistic garment of FIG. 1A, showing the adjustment of the ballistic garment from a first configuration to a second configuration.

[0030] FIGS. 5A and 5B are rear perspective views of the ballistic garment and user of FIG. 1A, showing adjustment between a first configuration (FIG. 5A) and a second configuration (FIG. 5B).

[0031] FIG. 6 is an exploded view of a ballistic garment according to the instant disclosure.

[0032] FIGS. 7A and 7B are front and rear elevation views of a first extension of the ballistic garment of FIG. 6.

[0033] FIGS. 7C and 7D are front and rear elevation views of a second extension of the ballistic garment of FIG. 6.

[0034] FIGS. 7E and 7F are front and rear perspective views of the second extension of FIGS. 7C and 7D.

[0035] FIGS. 8A and 8B are rear elevation views of the ballistic garment of FIG. 6, showing the adjustment of the ballistic garment from a first configuration to a second configuration.

[0036] FIGS. 9A and 9B are cross-sectional views of an example of a ballistic garment and user of FIGS. 5A and 5B, respectively taken at section lines 9A-9A and 9B-9B of FIGS. 5A and 5B.

[0037] FIGS. 10A and 10B are cross-sectional views of another example of a ballistic garment and user of FIGS. 5A and 5B, respectively taken at section lines 9A-9A and 9B-9B of FIGS. 5A and 5B.

[0038] Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

[0039] Example embodiments will now be described more fully with reference to the accompanying drawings. Example embodiments are provided so that this disclosure will be thorough, and will fully convey the scope of those who are skilled in the art.

Numerous specific details are set forth such as examples of specific components, devices, and methods, to provide a thorough understanding of embodiments of the present disclosure. It will be apparent to those skilled in the art that specific details need not be employed, that example embodiments may be embodied in many different forms and that neither should be construed to limit the scope of the disclosure. In some example embodiments, well-known processes, well-known device structures, and well known technologies are not described in detail.

[0040] The terminology used herein is for the purpose of describing particular example embodiments only and is not intended to be limiting. As used herein, the singular forms "a," "an," and "the" may be intended to include the plural forms as well, unless the context clearly indicates otherwise. The terms "comprises," "comprising," "including," and "having," are inclusive and therefore specify the presence of integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof. The method steps, processes, and operations described herein are not to be construed as necessarily requiring their performance in the particular order discussed or illustrated, unless specifically identified as an order of performance. It is also to be understood that additional or alternative steps may be employed.

[0041] When an element or layer is referred to as being "on," "engaged to," "connected to," or "coupled to" another element or layer, it may be directly on, engaged, connected or coupled to the other element or layer, or intervening elements or layers may be present. In contrast, when an element is referred to as being "directly on," "directly engaged to," "directly connected to," or "directly coupled to" another element or layer, there may be no intervening elements or layers present. Other words used to describe the relationship between elements should be interpreted in a like fashion (e.g., "between" versus "directly between," "adjacent" versus "directly adjacent," etc.). As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0042] Although the terms first, second, third, etc. may be used herein to describe various elements, components, regions, layers and/or sections, these elements, components, regions, layers and/or sections should not be limited by these terms. These

terms may be only used to distinguish one element, component, region, layer or section from another region, layer or section. Terms such as "first," "second," and other numerical terms when used herein do not imply a sequence or order unless clearly indicated by the context. Thus, a first element, component, region, layer or section discussed below could be termed a second element, component, region, layer or section without departing from the teachings of the example embodiments.

[0043] Spatially relative terms, such as "inner," "outer," "beneath," "below," "lower," "above," "upper," and the like, may be used herein for ease of description to describe one element or feature's relationship to another element(s) or feature(s) as illustrated in the figures. Spatially relative terms may be intended to encompass different orientations of the device in use or operation in addition to the orientation depicted in the figures. For example, if the device in the figures is turned over, elements described as "below" or "beneath" other elements or features would then be oriented "above" the other elements or features. Thus, the example term "below" can encompass both an orientation of above and below. The device may be otherwise oriented (rotated 90 degrees or at other orientations) and the spatially relative descriptors used herein interpreted accordingly.

[0044] With reference to the figures, a ballistic garment 10 according to the instant disclosure includes an adjustable belt 12 and a pair of shoulder straps 14.

[0045] Referring to FIG. 2, the belt 12 includes a main body 16 and a pair of extensions 18a, 18b slideably attached to the main body 16, as discussed in greater detail below. The belt 12 may further include a strap 20 operable to secure the belt 12 in a closed position around a waist of a user 100.

[0046] As shown in FIGS. 2 and 4A, the main body 16 includes a stiffener layer 22, a ballistic layer 23, and a cushioning layer 24. The stiffener layer 22 is configured to provide rigidity to the main body 16 of the belt along a longitudinal (i.e. height) axis of the user 100, thereby minimizing sagging of the main body 16 when accessories are attached to the garment 10. As described below, the ballistic layer 23 and the cushioning layer 24 are positioned in a central portion of the main body 16 and are respectively configured to provide ballistic protection and comfort to a lumbar region of the user 100. The main body 16 defines a proximal side 26 and an opposing distal side 28. Generally,

the proximal side 26 is configured to face inward towards waist of the user 100 when the belt 12 is in the closed position around the waist of the user 100, as shown in FIGS. 1A and 1B, while the distal side 28 faces outwardly from the waist of the user 100.

[0047] The stiffener layer 22 includes a central panel 22a and a pair of wings 22b extending laterally outwardly from opposing sides of the central panel 22a. The central panel 22a is configured to cover at least a portion of the lumbar region of the user 100. Accordingly, a first one of the wings 22b is configured to extend around left-hand side of the user 100, while a second one of the wings 22b is configured to extend around the right-hand side of the user 100.

[0048] In some examples, the central panel 22a and the wings 22b may be integrally formed of a single piece of material. For example, the central panel 22a and the wings 22b may be cut from a single piece of material having a relatively low tensile modulus, while remaining flexible. Thus, the stiffener layer 22 will bend around a waist of the user 100, but will remain substantially rigid with respect to the height of the user 100. Some examples of suitable materials for the stiffener layer 22 include Tegris®, polyethylene, and carbon fiber. In addition to providing desirable tensile and bending characteristics, the material of the stiffener layer 22 may be selected to provide desirable ballistic characteristics. In some examples, the central panel 22a and the wings 22b may be formed of different materials. For example, the central panel 22a may be formed of a first material and the wings 22b may be separately formed of a second material and joined to the central panel.

[0049] As illustrated in FIGS. 9A and 9B, the ballistic layer 23 and the cushioning layer 24 of the main body 16 are disposed on the proximal side 26 of the central panel 22a, while the proximal sides 26 of the wings 22b of the main body 16 are exposed. Accordingly, a thickness of the main body 16 at the central panel 22a may be greater than a thickness at the wings 22b. In some examples, the ballistic layer 23 and the cushioning layer 24 may extend along at least a portion of one or both of the wings 22b.

[0050] The ballistic layer 23 may be formed of armor material having desirable ballistic characteristics. The cushioning layer 24 is formed of a compressible foam material. In some examples ballistic layer 23 and the cushioning layer 24 may be integrally formed of a soft ballistic material, such that the integrally-formed ballistic layer

23 and cushioning layer 24 can provide both ballistic protection and comfort. In other examples, the ballistic layer 23 may be formed of the same material as the central panel 22a. The ballistic layer 23 and the cushioning layer 24 may be covered in a breathable, moisture-repellant material configured to allow thermal energy to escape from the cushioning layer 24, thereby maximizing user comfort.

[0051] With reference to FIGS. 2 and 4D, the main body 16 further includes a fastener 32a operable to releasably secure each of the extensions 18a, 18b in a desired position when the extensions 18a, 18b are assembled to the main body 16. In some examples, the extensions 18a, 18b may each include a corresponding fastener 32b configured to cooperate with the fastener 32a of the main body 16. In the illustrated example, the fasteners 32a, 32b are a hook and loop fabric formed on the main body 16 and the extensions 18a, 18b. More particularly, the first fastener 32a of the main body 16 is formed across a width of the distal side 28 of the central panel 22a, thereby allowing a lateral position of the extensions 18a, 18b to be secured at any desired position along the central panel, as discussed in greater detail below. Although hook-and-loop fabric is used in the illustrated example, the fasteners 32a, 32b may be any type of fastener suitable for securing the extensions 18a, 18b, such as zippers, buttons, clasps, hooks, or adhesives. For example, the central panel 22a may include a plurality of buttons disposed across the width thereof, thereby allowing the extensions to be secured to any of the buttons to secure the desired position of the wings.

[0052] The main body 16 of the belt 12 further includes a flap 34 configured to conceal the central panel 22a. Particularly, the flap 34 may be configured to conceal the fastener 32a of the main body 16, which extends across the central panel 22a, as discussed above. The flap 34 is operable between an open position, whereby the fastener 32a of the main body 16 is concealed, and a closed position, whereby the fastener 32a is concealed beneath the flap 34. In the example shown in FIG. 2, the flap 34 includes an upper flap 34a extending from a top edge of the central panel 22a and a lower flap 34b extending from an opposing bottom edge of the central panel 22a. The upper flap 34a and the lower flap 34b each include cooperating fasteners 35a, 35b for securing the flaps 34a, 34b to each other, in the closed position. Again, the fasteners 35a, 35b are hook-and-loop fabric, but may be any fasteners suitable for securing the flaps to each other.

The upper flap 34a and/or the lower flap 34b may be formed of a MOLLE-compatible webbed fabric for attaching accessories.

[0053] With reference to FIGS. 2–3F, each one of the extensions 18a, 18b is configured to be received on a respective one of the wings 22b of the main body 16. In view of the substantial similarity in structure and function of the components associated with the extension 18a with respect to the extension 18b, like reference numerals are used hereinafter and in the drawings to identify like components, while reference numerals containing letter extensions are used to identify distinct components of the extensions 18a, 18b. Accordingly, except where noted, the structure and function of the left-side extension 18a is substantially the same as the structure and function of the right-side extension 18b. Thus, the left-side extension 18a and the right-side extension 18b, as described, are interchangeable with each other.

[0054] Each of the extensions 18a, 18b includes a medial end 36 configured to be disposed adjacent to the central panel 22a of the main body 16 and a lateral end 38 opposite the medial end 36. The extensions 18a, 18b further include a proximal side 40 and a distal side 42 joined along respective upper and lower edges to define a conduit 44 for receiving one of the wings 22b therethrough. In the illustrated embodiment, the proximal side 40 is formed of a cushioning material while the distal side 42 is formed of a MOLLE-compatible webbed fabric panel for attaching accessories. The distal side 42 of the extensions 18a, 18b includes a pocket 43 for receiving a ballistic panel 45 therein. As shown in FIG. 3F, the pocket 43 includes an opening formed at the medial end 36 of the distal side 42.

[0055] Additionally or alternatively, the proximal side 40 of the extensions 18a, 18b may comprise multiple layers 41a, 41b of ballistic materials, wherein a first one of the layers 41a is a different ballistic material than a second one of the layers 41b, as shown in the example of FIGS. 10A and 10B. The ballistic materials may be chosen to impart properties of comfort, weight, durability, and/or ballistic protection, for example. At least one of the layers 41a, 41b may be formed of a ballistic material similar to a material forming the stiffener 22, the ballistic layer 23, or the cushioning layer 24 of the main body 16.

[0056] With continued reference to FIGS. 3A–3F, the distal side 42 extends beyond the proximal side 40 at the medial end 36 of the extension 18a, 18b, forming a tab 46 for securing the extension 18a, 18b to the central panel 22a of the main body 16. As introduced above, the fastener 32b (e.g., hook-and-loop fabric) of the extension 18a, 18b is disposed on the tab 46. In the illustrated example, the fastener 32b is formed on a proximal surface of the tab 46. The tab 46 is configured to overlap the central panel 22a of the main body 16 when the extension 18a, 18b is assembled to the main body 16 so that the fastener 32b of the tab 46 can be joined to the fastener 32a of the central panel 22a.

[0057] Similarly, the proximal side 40 may extend beyond the distal side 42 at the lateral end 38 of the extension 18a, 18b, forming a protrusion 48 at the lateral end 38 of the extension 18a, 18b. The protrusion 48 may include a loop 50 configured to receive the strap 20 therethrough. The loop 50 may be operable between an open position (e.g., FIG. 3E) for receiving the strap 20, and a closed position (e.g., FIG. 4B) for securing the strap 20 therein.

[0058] At least one of the extensions 18a, 18b may include a coupler 52 configured to adjustably and securably attach medial end 36 of one of the one of the extensions 18a, 18b directly to the medial end 36 of the other one of the extensions 18a, 18b. As shown in the illustrated example, the coupler 52 includes a strap 52a disposed at the medial end 36 of the left-side extension 18a and a buckle 52b disposed at the medial end 36 of the right-side extension 18b, whereby the medial ends 36 of the extensions 18a, 18b are configured to be adjustably coupled to each other, as shown in FIGS. 5A and 5B, and explained below.

[0059] The belt 12 may further include a plurality of attachment points 54 for joining the shoulder harness 14 to the belt 12. In some examples, the shoulder harness 14 is adjustably and removably attached to the belt 12 at each of the attachment points 54. In the illustrated example, the attachment points 54 are shown as ladderlock buckles, which are configured to receive an end of one of the shoulder straps 14. However, other types of buckles at attachments may be used. Additionally or alternatively, the ends of the shoulder straps 14 may be fixedly attached to the belt 12 at the attachment points 54.

[0060] The strap 20 generally comprises a flexible band 56 having a closure 58 for securing the strap 20 in the closed position, as shown in FIG. 1A. A length of the strap 20 may be adjustable to accommodate a size of the waist of the user 100. As shown, the closure 58 includes a male portion 58a disposed at a first end of the strap 20 and a corresponding female portion 58b disposed at a second end of the strap, whereby the

[0061] With reference to FIGS. 4A–5B, an adjustment of the belt 12 from a retracted configuration (FIGS. 4A-4C, 5A) to an extended configuration (FIGS. 4D–4F, and 5B) is shown. Although the belt 12 is only shown as being adjusted from the retracted position (i.e., waist circumference) to the extended position, a degree of the adjustment of the belt 12 is variable. Accordingly, the belt 12 may be adjusted to sizes intermediate the retracted configuration and the extended configuration illustrated in FIGS. 4A–4F.

[0062] Referring to FIG. 4A, the belt 12 is shown in the retracted configuration, wherein the belt 12 is adjusted to a minimum size. As shown in FIGS. 4A, in the retracted configuration the proximal sides 40 of the extensions 18a, 18b are disposed adjacent to the central panel 22a of the main body 16. Accordingly, in the retracted configuration, the ballistic layer 23 of the main body 16 and ballistic panels 45 of the extensions 18a, 18b overlap by a first amount to form a substantially continuous ballistic layer around the waist of the user 100, as shown in FIG. 9A.

[0063] In a first adjustment step, shown in FIG. 4B, the upper flap 34a and the lower flap 34b are moved to the open position to expose the coupler 52 and the tabs 46 of the extensions 18a, 18, as shown in FIG. 4C. As indicated by the arrows of FIG. 4C, in the second adjustment step of FIG. 4C, the strap 52a is detached from the buckle 52b to disconnect the left-side extension 18a from the right-side extension 18b. Subsequently, the tabs 46 are detached from the central panel 22a, as shown in FIG. 4D.

[0064] With the tabs 46 detached from the central panel 22a, the belt 12 can be adjusted from the retracted configuration to the extended configuration by sliding the extensions 18a, 18b laterally outwardly along the wings 22b of the main body 16, as indicated by the arrows in FIG. 4D. Thus, while the wings 22b are fully received within the conduit 44 of the extensions 18a, 18b when the belt 12 is in the first configuration, the wings 22b are only partially received within the conduits 44 when the belt 12 is adjusted to the second configuration, as shown in FIG. 4E and indicated by the hidden lines in

FIG. 4F. Once the size of the belt 12 is adjusted to the desired size, the position of the belt 12 is secured by reattaching the fasteners 32b of the tabs 46 to the fasteners 32a of the central panel 22a. The strap 52a is then reattached to the buckle 52b to secure the extensions 18a, 18b to each other in the extended position, as shown in FIGS. 4F and 5B.

[0065] With reference to FIGS. 6-8B, another example of a ballistic garment 10a is provided. In view of the substantial similarity in structure and function of the components associated with the article of ballistic garment 10a with respect to the ballistic garment 10, like reference numerals are used hereinafter and in the drawings to identify like components, while like reference numerals containing letter extensions are used to identify those components that have been modified.

[0066] In the example of the ballistic garment 10a shown in FIGS. 6-8B, the belt 12a has been modified from the example of the belt 12 discussed above. Particularly, the main body 16a and the extensions 18c, 18d have been modified, where instead of connecting the two extensions 18c, 18d to each other via the single coupler 52 in the lumbar region of the main body 16a, the extensions 18c, 18d are coupled to the wings 22b of the main body 16a at flank or umbilical regions. Thus, the position of the extensions 18c, 18d can be independently adjusted relative to each other and the main body 16a.

[0067] With reference to FIG. 6, the main body 16a of the belt 12a includes wings 22b similar to the wings 22b described above with respect to the main body 16. Here, each of the wings 22b includes a D-ring 52c attached adjacent to a distal end of the wing 22b. In the illustrated example, the D-rings 52c are attached to the distal side 28 of the main body 16a. However, the D-rings 52c may be attached to the proximal side 26.

[0068] With continued reference to FIG. 6, each of the extensions 18c, 18d includes a strap 52d having a first end 53a attached at the lateral end 38 of the extension 18c, 18d. A free, second end 53b of the strap 52d is configured to be routed towards the medial end 36 of the extension and through a respective one of the D-rings 52c of the main body 16a, as best shown in FIG. 8A.

[0069] Each of the extensions further includes a fastener 51 fixed at the lateral end 38, adjacent to the first end 53a of the strap 52d. The fastener 51 is configured to interface with the free end 53b of the strap 52d to secure a position of the free end 53b of

the strap 52d. In the illustrated example, the fastener 51 is slide buckle, such as a tri-glide buckle, and is configured to have the free end 53b of the strap 52d routed therethrough. However, in other examples the fastener 51 may be a hook-and-loop fastener, a snap or button, or other means of mechanically securing the free end 53b of the strap 52d to the lateral end 38 of the extension 18c, 18d.

[0070] With reference to FIGS. 8A and 8B, when the belt 12a is assembled, the wings 22b of the main body 16a are inserted into the conduits 44 of the respective extensions 18c, 18d. The free end 53b of the strap 52d is then routed from the lateral end 38 of the extension 18a, 18b to the D-ring 52c of the main body 16a, and then back to the fastener 51 to secure a position of the extension 18a, 18b relative to the respective wings 22b. When the belt 12a is in a first, extended configuration, the straps 52d are extended such that the D-rings 52c of the main body 16a are spaced apart from the lateral ends 38 the of the extensions 18c, 18d by a first distance D1, as shown in FIG. 8A.

[0071] To adjust the belt 12a to a retracted configuration, the free ends 53b of the straps 52d are pulled in a direction away from the D-rings 52c of the main body 16a. By pulling the free ends 53b of the straps 52d, the strap 52d is pulled through the D-ring 52c, causing the attached end 53a of the straps 52d to move towards the D-rings 52c. Thus, when the free ends 53b of the straps 52d are pulled, the extensions 18c, 18d are pulled inwardly towards the distal ends of the wings 22b, whereby D-rings 52c of the main body 16a are spaced apart from the lateral ends 38 of the extensions 18c, 18d by a second distance D2 that is less than the first distance D1, as shown in FIG. 8B. To move the extensions back to the extended position, or to an intermediate position between the extended position and the retracted position, the lengths of the straps 52d between the D-rings 52c and the fasteners 51 are extended to allow the lateral ends 38 of the extensions 18c, 18d to be moved away from D-rings 52c of the main body 16a. Additionally or alternatively, the positions of the extensions 18c, 18d may be adjusted independently of each other.

[0072] With reference to FIGS. 6-7D, in the illustrated example of the garment 10a, the male portion 58a of the closure 58 and the female portion 58b of the closure 58 are directly connected to the respective lateral ends 38 of the extensions 18c, 18d, as shown in FIGS. 6-7B. Thus, instead of using the independent strap 20, as described with respect

to the garment 10 shown in FIGS. 1-5, the lateral ends 38 of the extensions 18c, 18d are coupled to each other to secure the belt around the waist of the user.

[0073] With reference to FIGS. 9A and 9B, the belt 12, 12a of the instant disclosure advantageously provides continuous ballistic protection by providing multiple ballistic layers 23, 45 that are configured to telescope with respect to each other. For example, in FIG. 9A the belt 12, 12a is shown in the first configuration, where the ballistic panels 45 of the extension 18a, 18b overlap the ballistic layer 23 of the central panel 22a by a first amount. Accordingly, in the first configuration, the area of the belt 12, 12a adjacent the central panel 22a includes the ballistic layer 23 of the main body 16 along with the ballistic panels 45 of the extensions 18a, 18b. Referring to FIG. 9B, when the belt 12, 12a is adjusted to the second configuration the medial end of the proximal side 40 is spaced apart from the second ballistic layer 30 of the central panel 22a. However, ballistic protection is maintained by the continuous overlap of the ballistic layer 23 of the main body 16, 16a and the ballistic panels 45 of the extensions 18a, 18b. Thus, the belt 12, 12a advantageously provides continuous protection around the waist of the user 100, regardless of the position that the belt 12, 12a is adjusted to.

[0074] In addition to improved ballistics, the design of the instant disclosure provides maximized axial stability, thereby minimizing sag and misalignment of ballistic components of the belt. Particularly, by forming the conduit 44 along the length of the extension, in which the wings 22b of the main body 16, 16a can be received, alignment between the armored wings 22b and the extensions 18a, 18b is maintained. Maximized stability further decreases the likelihood that the belt 12, 12a will move out of position when worn by the user 100. To further improve stability of the belt 12, 12a, the proximal side 26 of the main body 16, 16a and the proximal side 40 of each of the extensions 18a-18d may include a friction member 60 disposed thereon. For example, as shown in FIGS. 3B, 3D, 3F, and 4A the friction member 60 may include a strip of material having a high coefficient of friction disposed along proximal sides 26, 40 of the main body 16, 16a and the extensions 18a-18c, such that the friction member 60 contacts the waist of the user 100 when the belt 12, 12a is worn.

[0075] A number of implementations have been described. Nevertheless, it will be understood that various modifications may be made without departing from the spirit and

scope of the disclosure. Accordingly, other implementations are within the scope of the following claims.

WHAT IS CLAIMED IS:

1. An adjustable ballistic garment (10, 10a), comprising:

a main body (16, 16a) having a central panel (22a) and a wing (22b) extending laterally from the central panel (22a), the central panel (22a) and the wing (22b) formed of a first material, the central panel (22a) including a first ballistic material (23); and

an extension (18a-18d) including a second ballistic material defining a conduit (44), wherein a portion of the wing (22b) of the main body (16, 16a) is received in the conduit (44).

2. The adjustable ballistic garment (10, 10a) of Claim 1, wherein the extension includes a first side (40) and a second side (42) opposing the first side (40), the conduit (44) being defined between the first side (40) and the second side (42).

3. The adjustable ballistic garment (10, 10a) of Claim 2, wherein the second side (42) includes a MOLLE-compatible webbed fabric.

4. The adjustable ballistic garment (10, 10a) of Claim 2, wherein the first side (40) extends beyond the second side (42) at a first end (38) of the extension (18a-18d), and the second side (42) extends beyond the first side (40) at a second end (36) of the extension.

5. The adjustable ballistic garment (10, 10a) of Claim 4, wherein the second side (42) of the extension (18a-18d) overlaps the central panel (22a) of the main body (16, 16a).

6. The adjustable ballistic garment (10, 10a) of Claim 1, wherein the central panel (22a) includes a layer (23) of the first ballistic material disposed on a first surface (26) thereof.

7. The adjustable ballistic garment (10, 10a) of Claim 6, wherein the central panel (22a) includes a first fastener (32a) disposed on a second surface (28) thereof, the second

surface (28) being on an opposite side of the central panel (22a) from the first surface (26).

8. The adjustable ballistic garment (10, 10a) of Claim 7, wherein the extension (18a-18d) includes a second fastener (32b) configured to cooperate with the first fastener (32a) to secure the extension (18a-18d) to the main body (16, 16a).

9. The adjustable ballistic garment (10, 10a) of Claim 7, further comprising a shoulder strap (14) having a first end attached to one of the main body (16, 16a) and the extension (18a-18d) and a second end attached to the other of the main body (16, 16a) and the extension (18a-18d).

10. The adjustable ballistic garment (10, 10a) of Claim 1, wherein the central panel (22a) and the wing (22b) are integrally formed of a single piece of material.

11. The adjustable ballistic garment of Claim 1, wherein the first and second ballistic material are fabricated from the same type of ballistic material.

12. An adjustable ballistic garment (10, 10a), comprising:

a main body (16, 16a) having a central panel (22a) and a pair of wings (22b) extending laterally outwardly from opposing sides of the central panel (22a);

a first extension (18a, 18c) having a first ballistic panel (41a, 41b), the first extension (18a, 18c) slideably received on a first one of the wings (22b) of the main body (16, 16a); and

a second extension (18b, 18d) having a second ballistic panel (41a, 41b), the second extension (18b, 18d) slideably received on a second one of the wings (22b) of the main body (16, 16a).

13. The adjustable ballistic garment (10, 10a) of Claim 12, wherein the central panel (22a) and the wings (22b) are integrally formed from a piece of a first ballistic material.

14. The adjustable ballistic garment (10, 10a) of Claim 13, wherein the central panel (22a) further comprises a third ballistic panel (23) disposed on a surface (26) thereof.

15. The adjustable ballistic garment (10, 10a) of Claim 14, wherein the garment (10, 10a) is positionable in a first position, wherein the first ballistic panel (41a, 41b) of the first extension and the second ballistic panel (41a, 41b) of the second extension are disposed adjacent to the third ballistic panel (23) of the central panel (22a), and a second position, wherein the first ballistic panel (41a, 41b) of the first extension (18a, 18c) and the second ballistic panel (41a, 41b) of the second extension (18a, 18c) are spaced apart from the third ballistic panel (23) of the central panel (22a).

16. The adjustable ballistic garment (10, 10a) of Claim 14, wherein the first ballistic panel (41a, 41b), the second ballistic panel (41a, 41b), and the third ballistic panel (23) are formed of a soft ballistic material.

17. The adjustable ballistic garment of Claim 12, wherein the first extension (18a, 18c) includes a first proximal side (40) and a first distal side (42) defining a first conduit (44), and the second extension (18b, 18d) includes a second proximal side (40) and a second distal side (42) defining a second conduit (44).

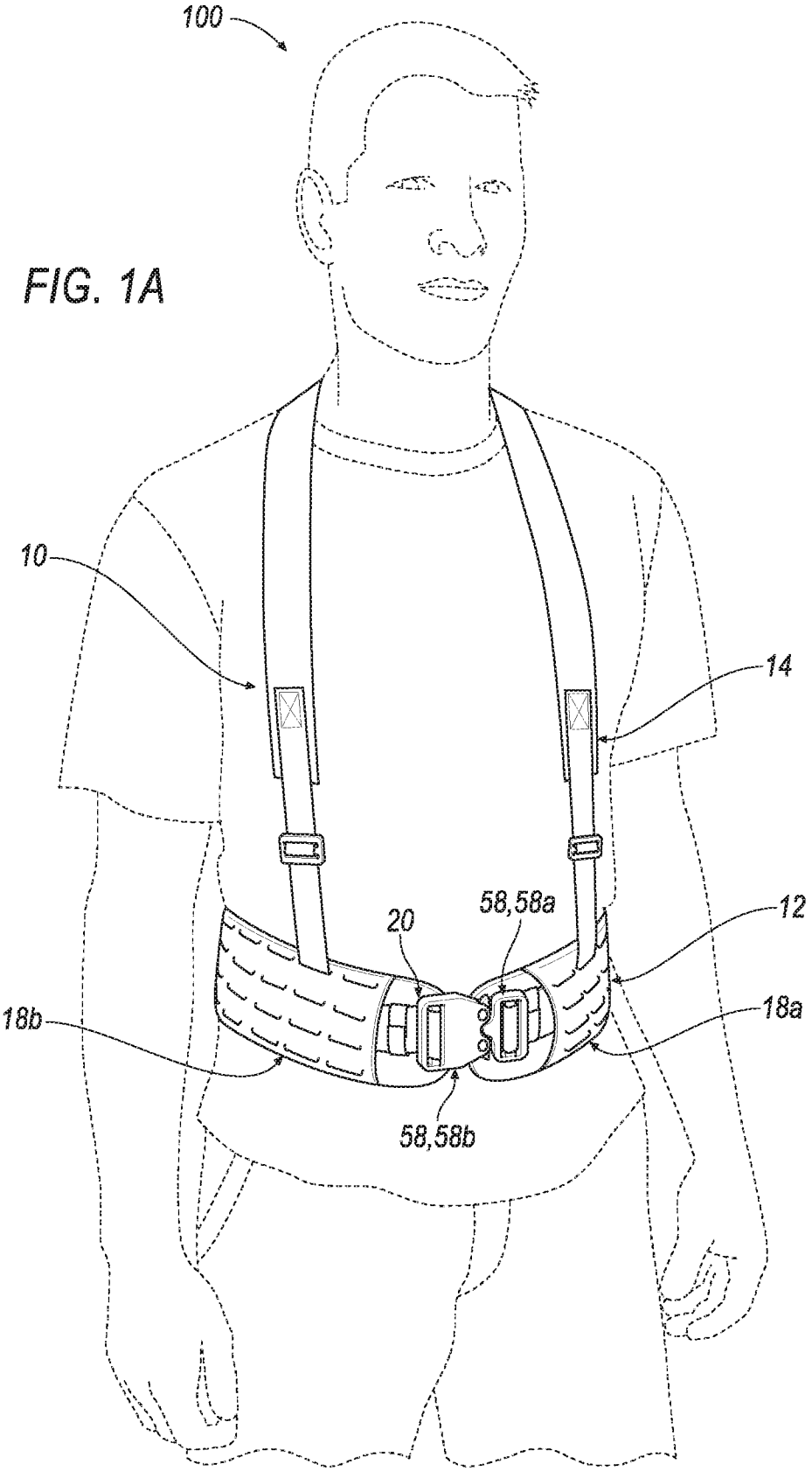
18. The adjustable ballistic garment (10, 10a) of Claim 17, wherein a first one of the wings (22b) is received in the first conduit (44) and a second one of the wings (22b) is received in the second conduit (44).

19. The adjustable ballistic garment (10, 10a) of Claim 18, wherein the first distal side (42) includes a first pocket (43) having a first ballistic panel (45) disposed therein and the second distal side (42) defines a second pocket (43) having a second ballistic panel (45) disposed there.

20. The adjustable ballistic garment (10, 10a) of Claim 12, wherein each of the first extension (18a, 18c) and the second extension (18b, 18d) includes a fastener (32b)

configured to cooperate with a fastener (32a) of the central panel (22a) to secure respective positions of the first extension (18a, 18c) and the second extension (18b, 18d).

FIG. 1A



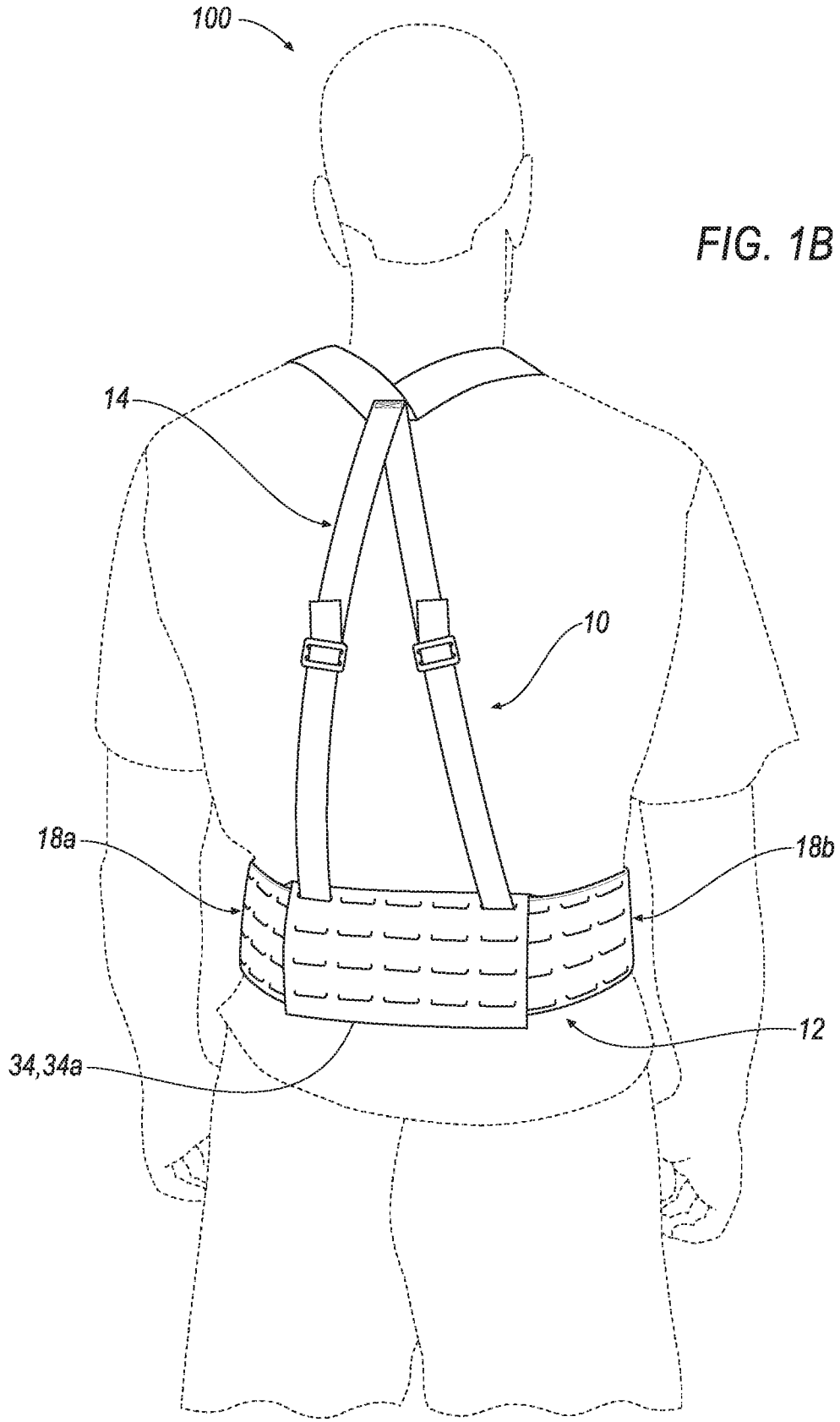
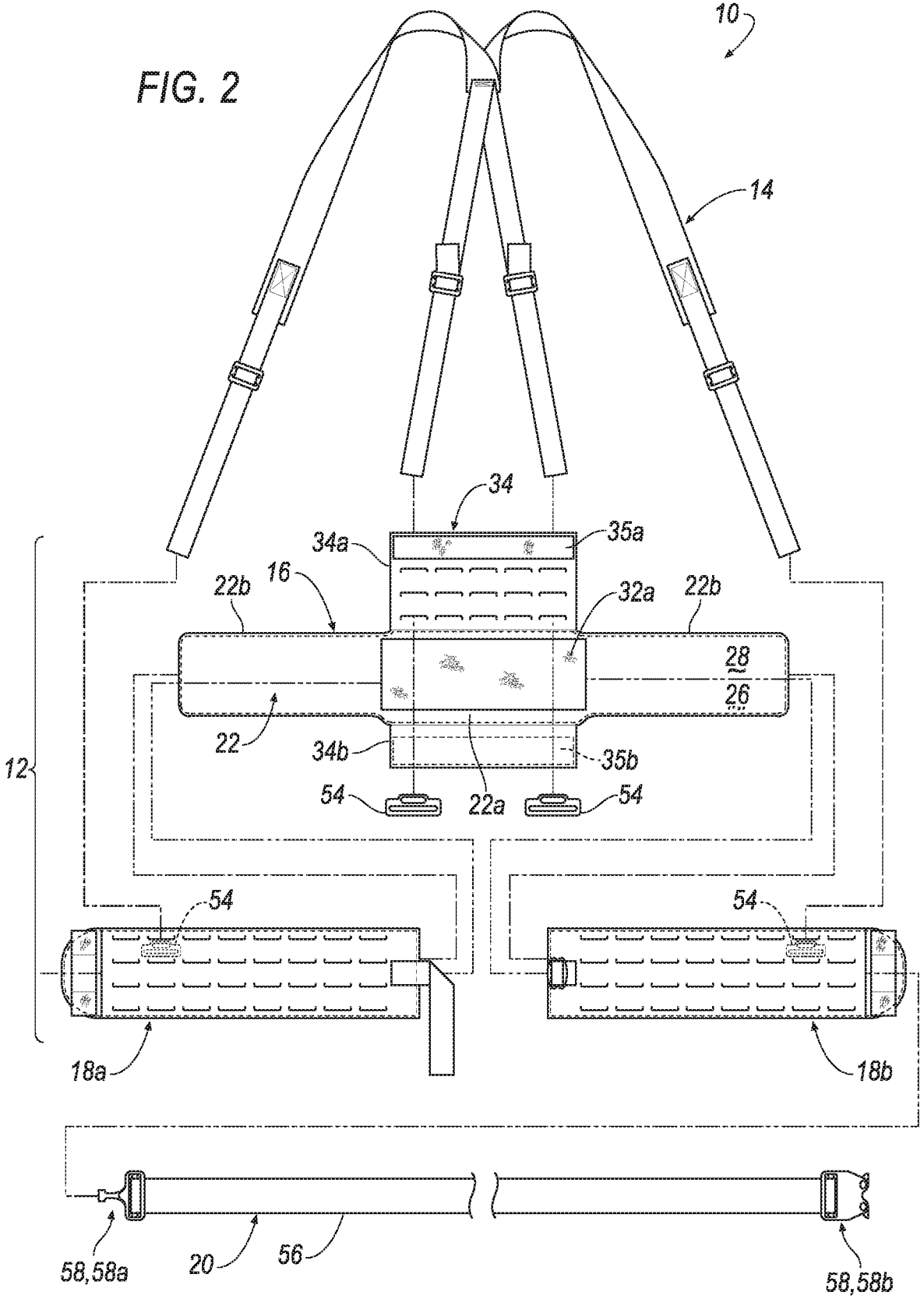


FIG. 1B

FIG. 2


10
14
34
34a
35a
16
22b
32a
22b
28
26
22
34b
35b
12
54
22a
54
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54
18a
18b
58,58a
20
56
58,58b

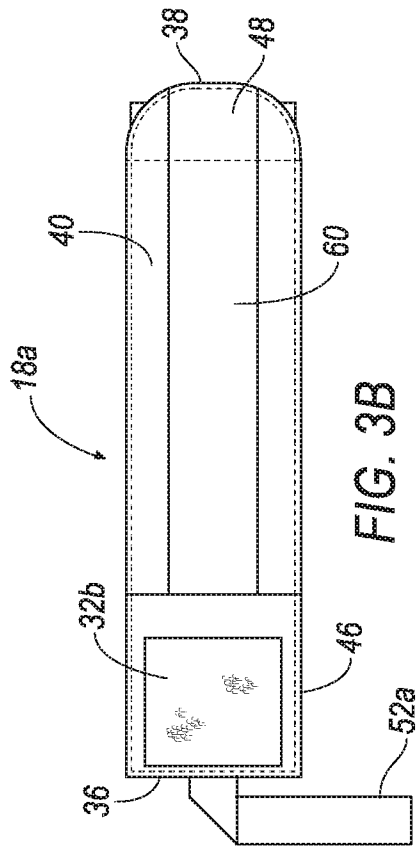


FIG. 3B

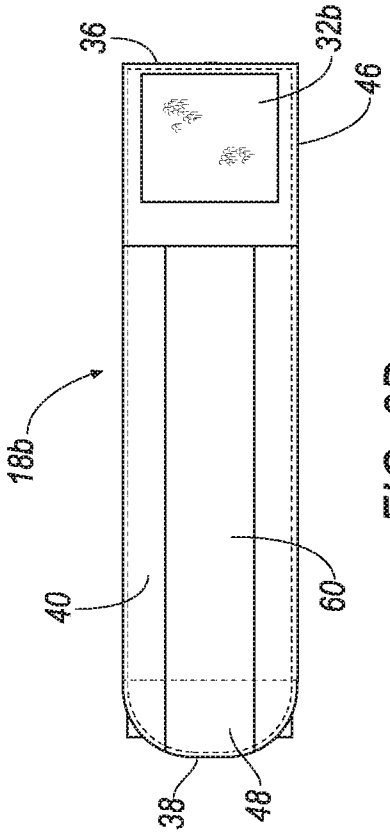


FIG. 3D

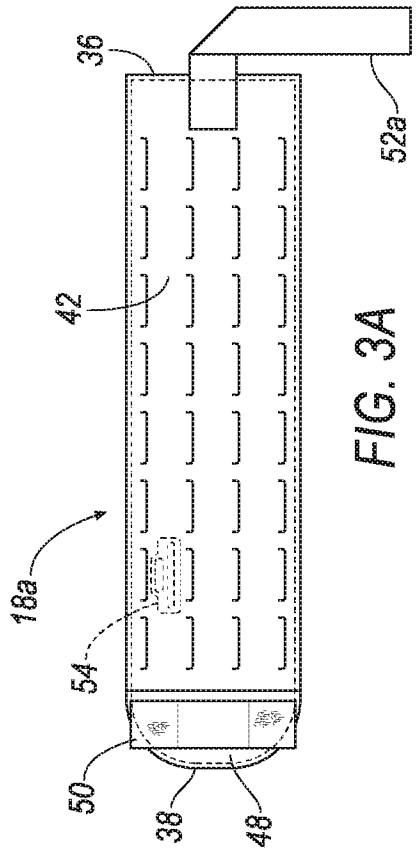


FIG. 3A

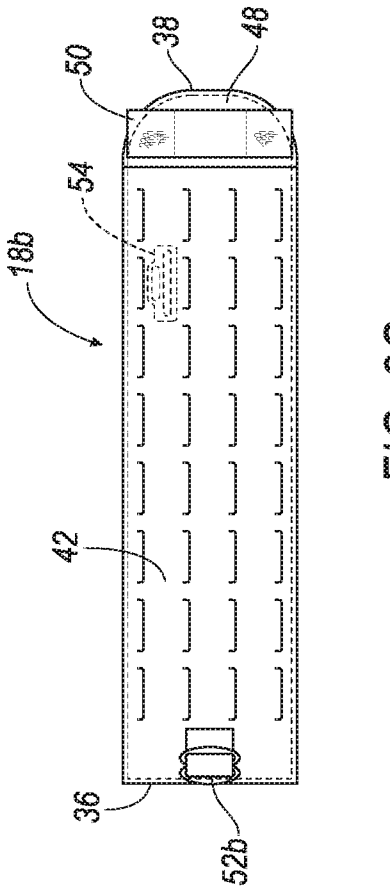


FIG. 3C

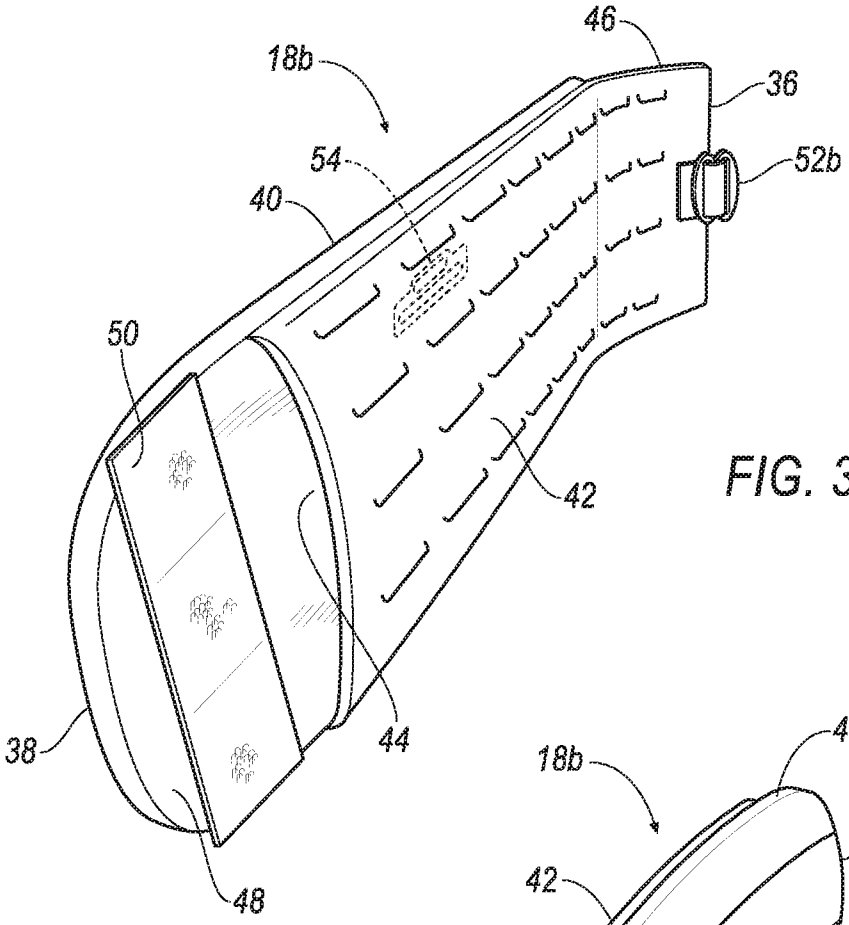

46
18b
36
54
52b
40
50
42
44
38
48

FIG. 3E

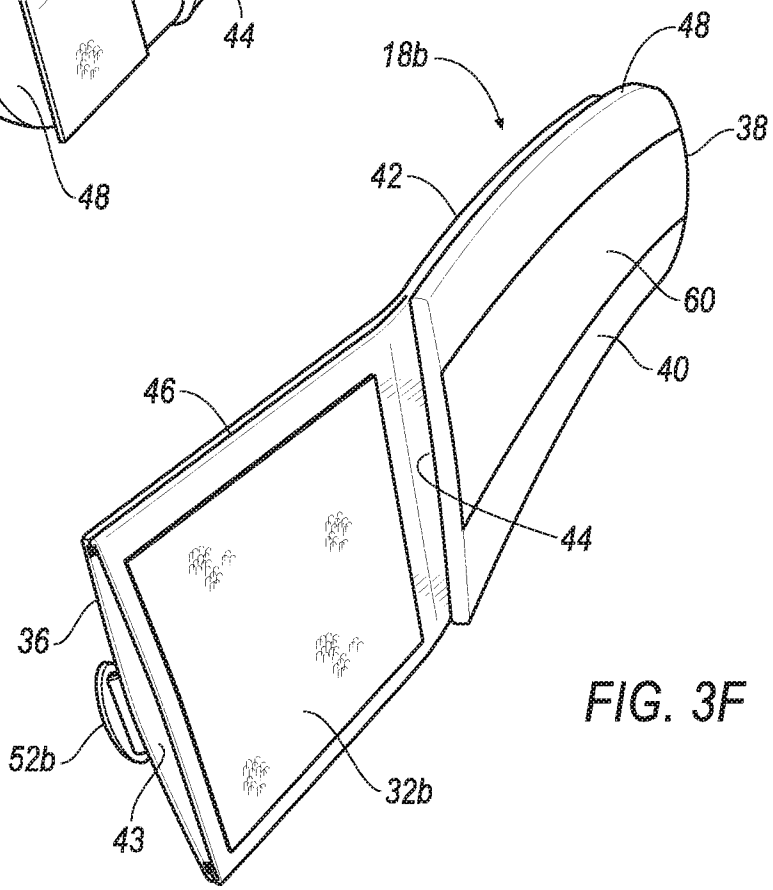

48
18b
38
42
60
40
46
44
36
52b
32b
43

FIG. 3F

FIG. 4A

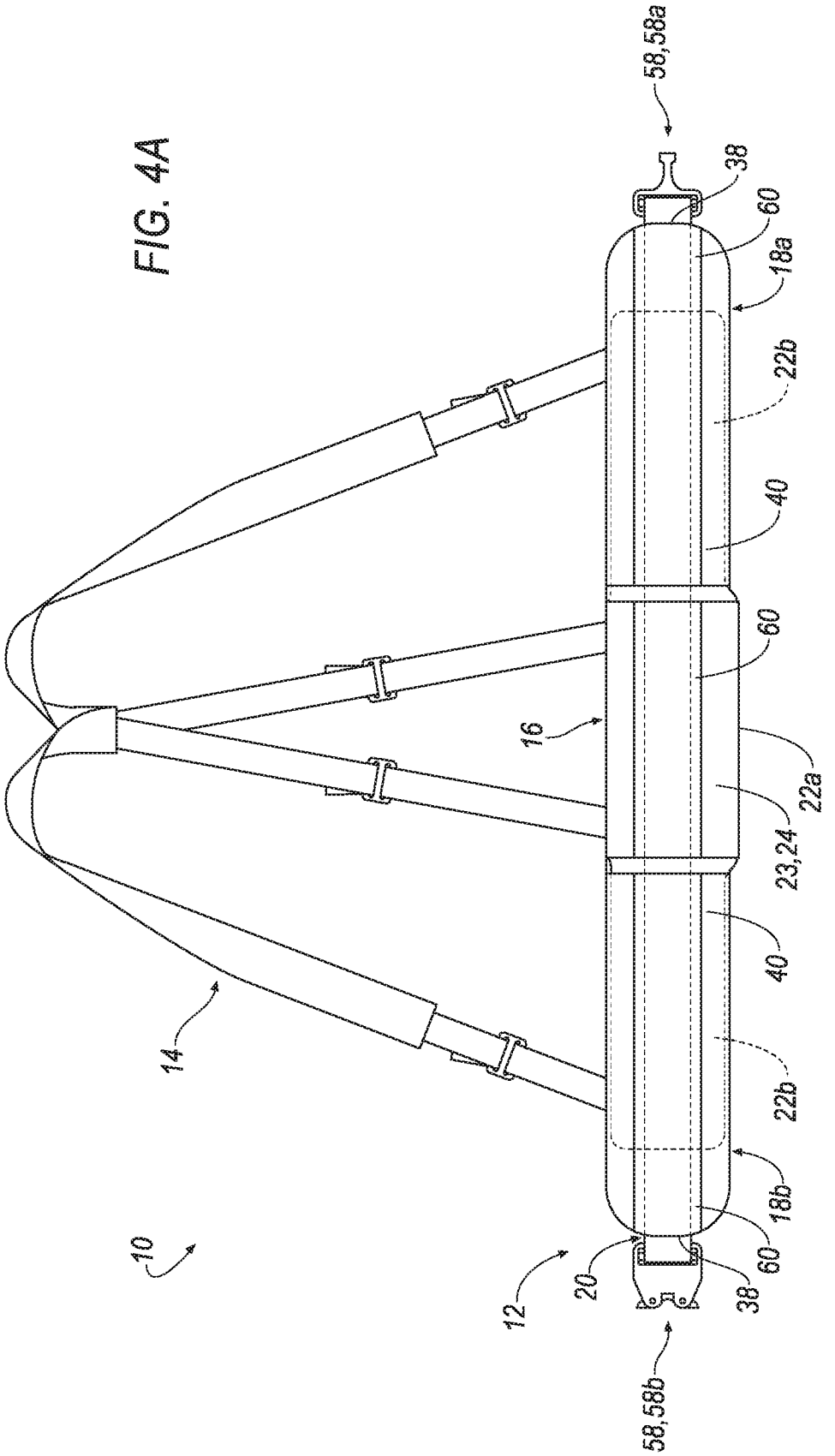

58,58a
38
60
18a
22b
40
60
16
22a
23,24
40
14
22b
18b
60
10
12
20
38
58,58b

FIG. 4B

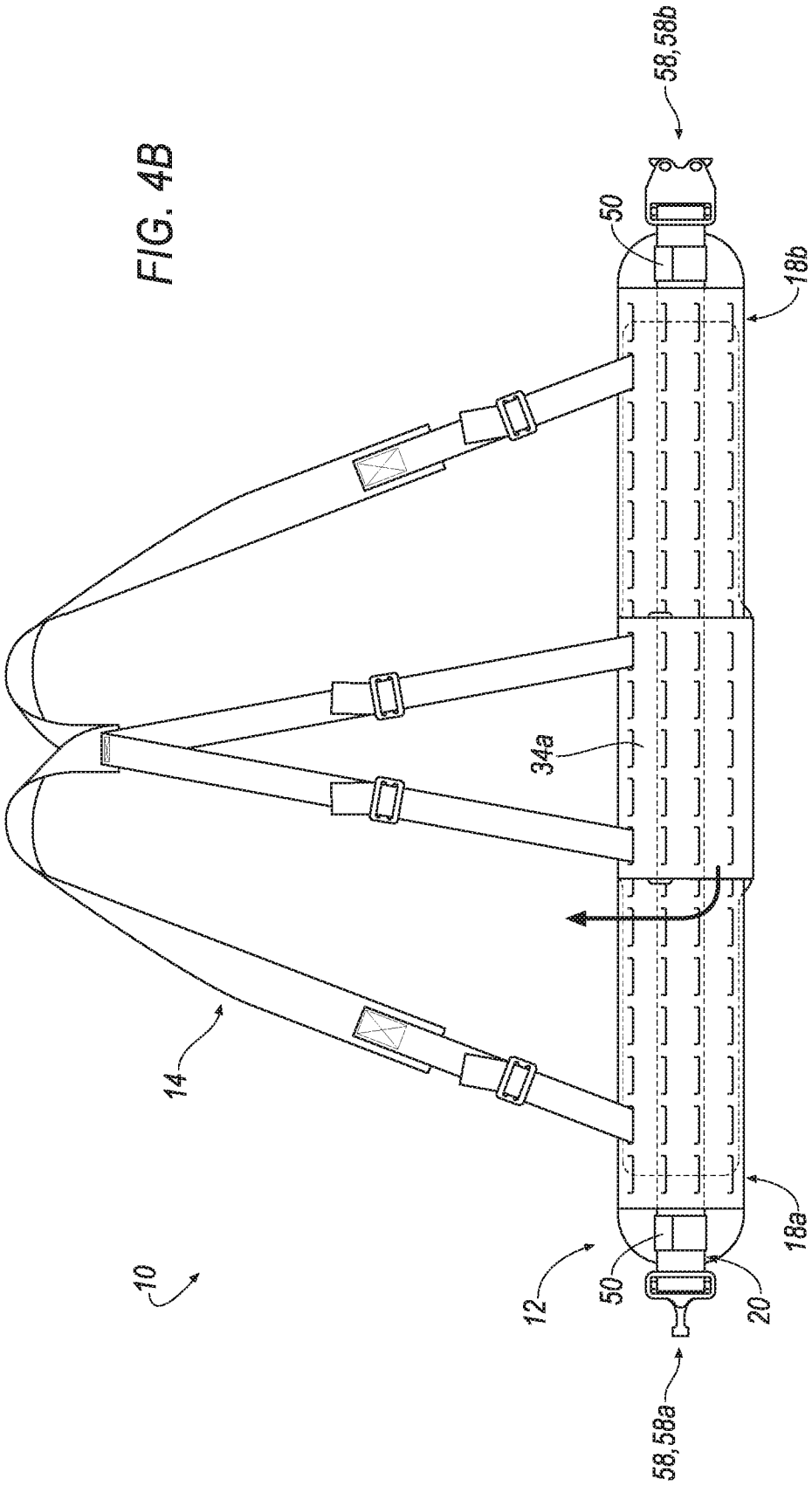


FIG. 4C

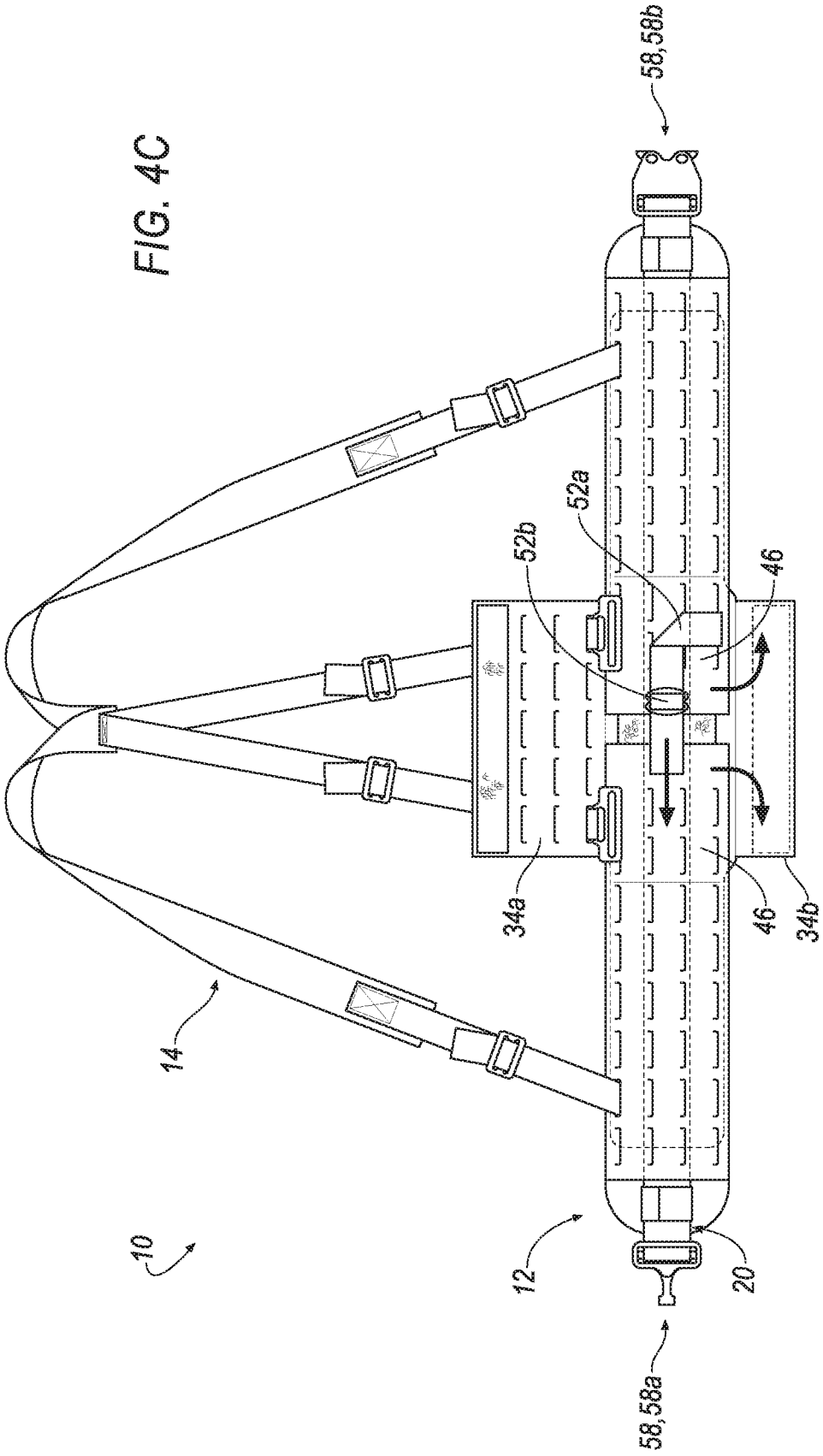


FIG. 4D

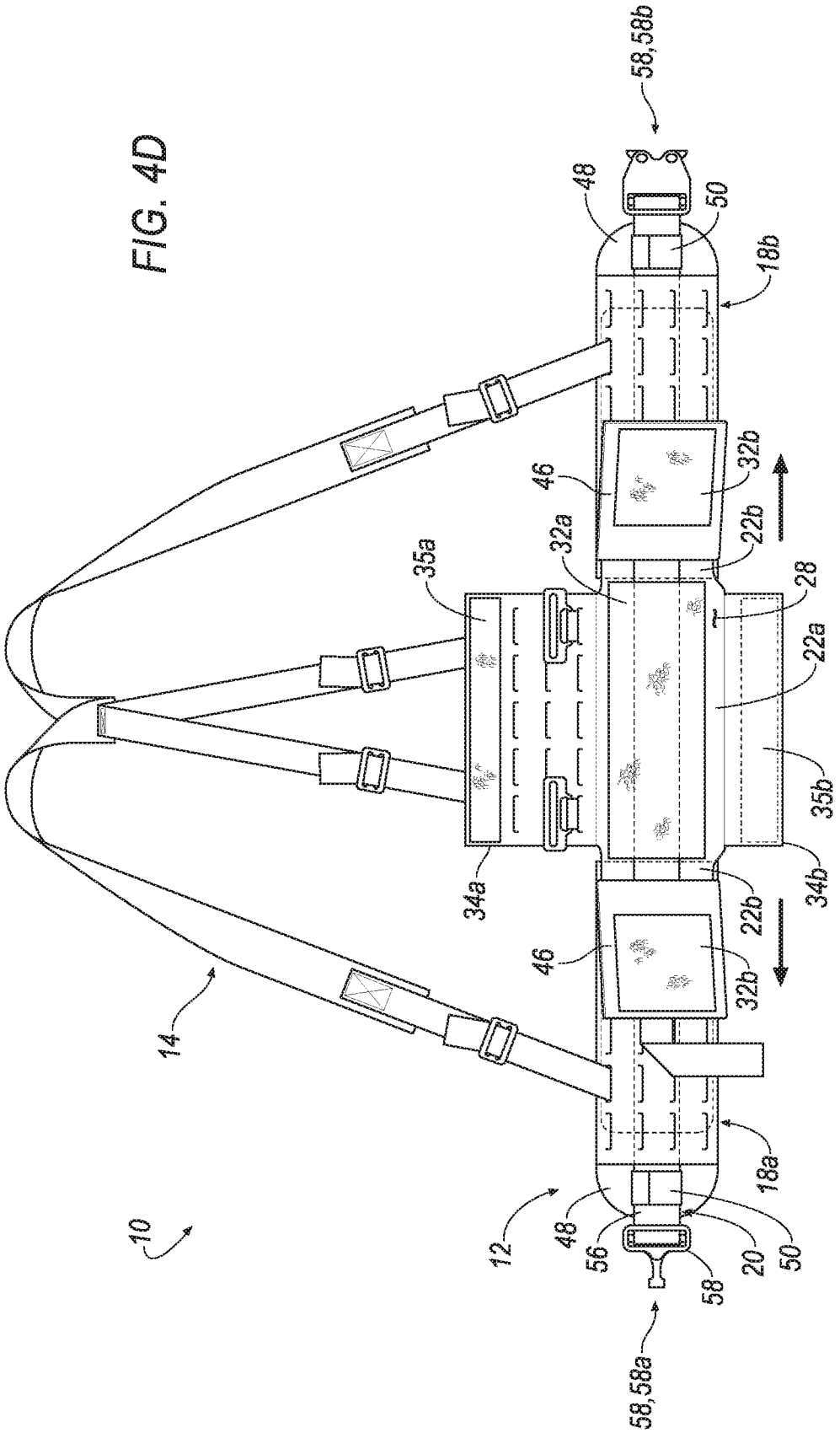

58,58b
48
50
18b
32b
46
22b
32a
35a
28
22a
35b
34b
34a
22b
46
32b
14
18a
10
12
48
56
20
50
58
58,58a

FIG. 4E

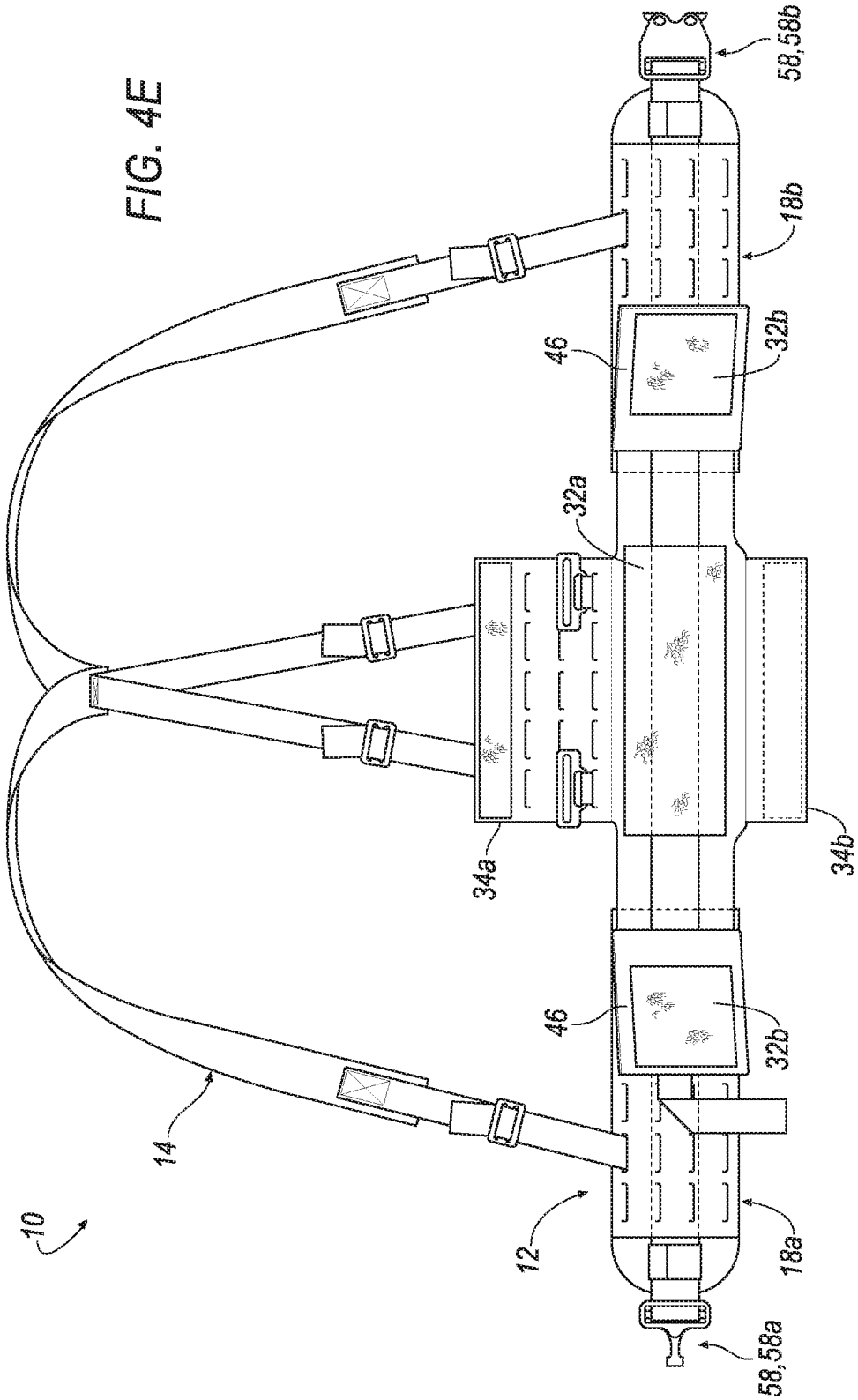
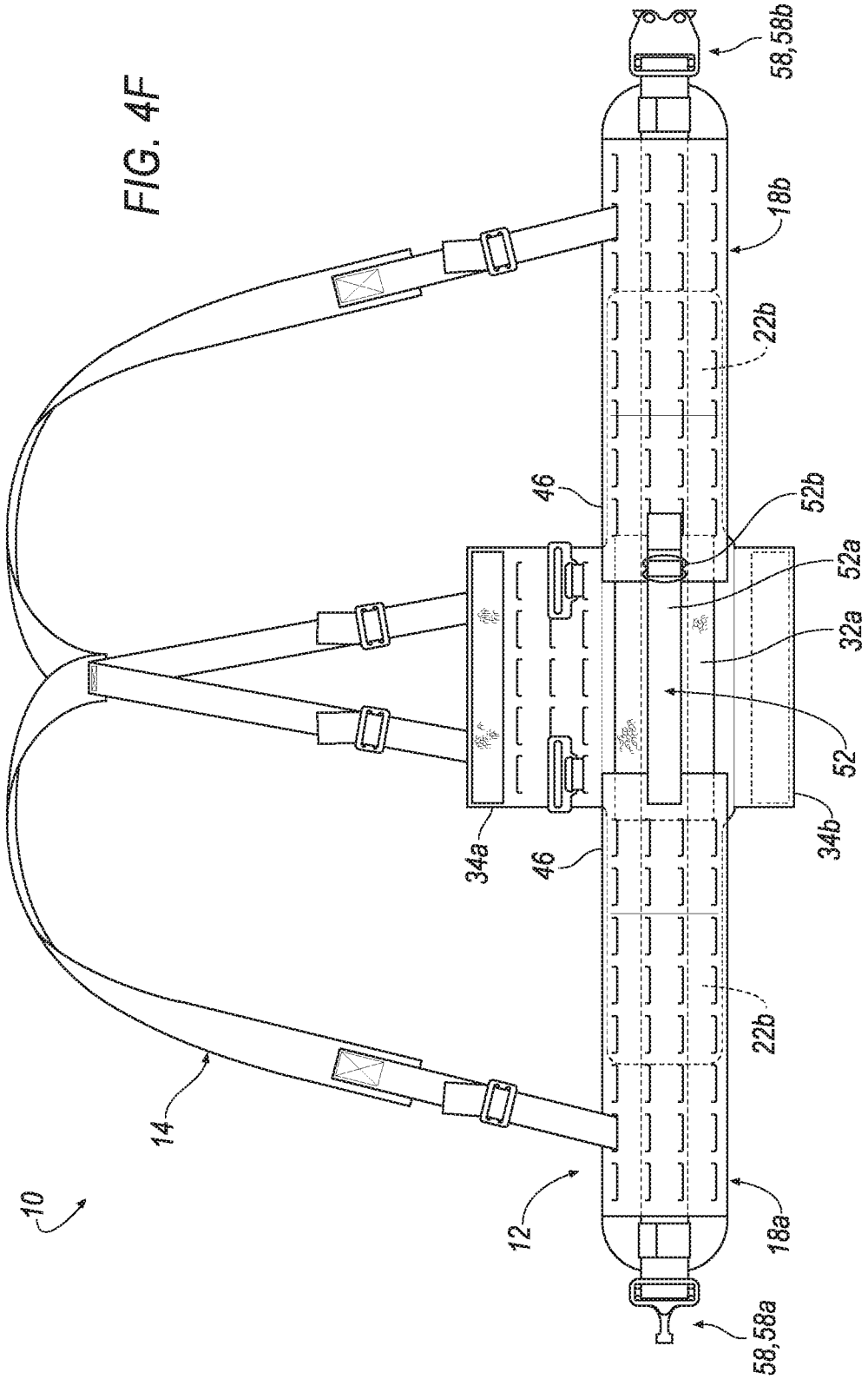


FIG. 4F



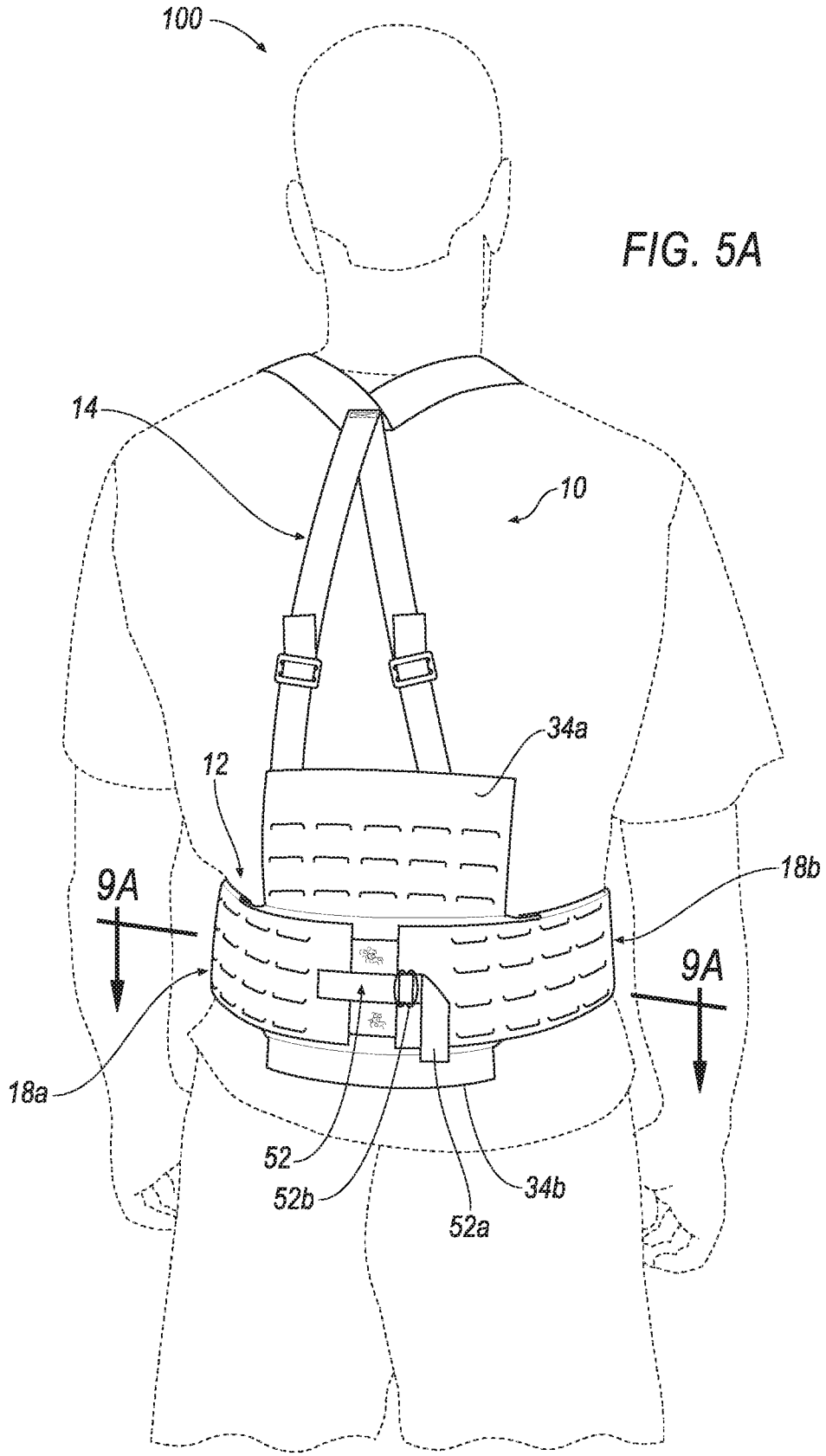


FIG. 5A

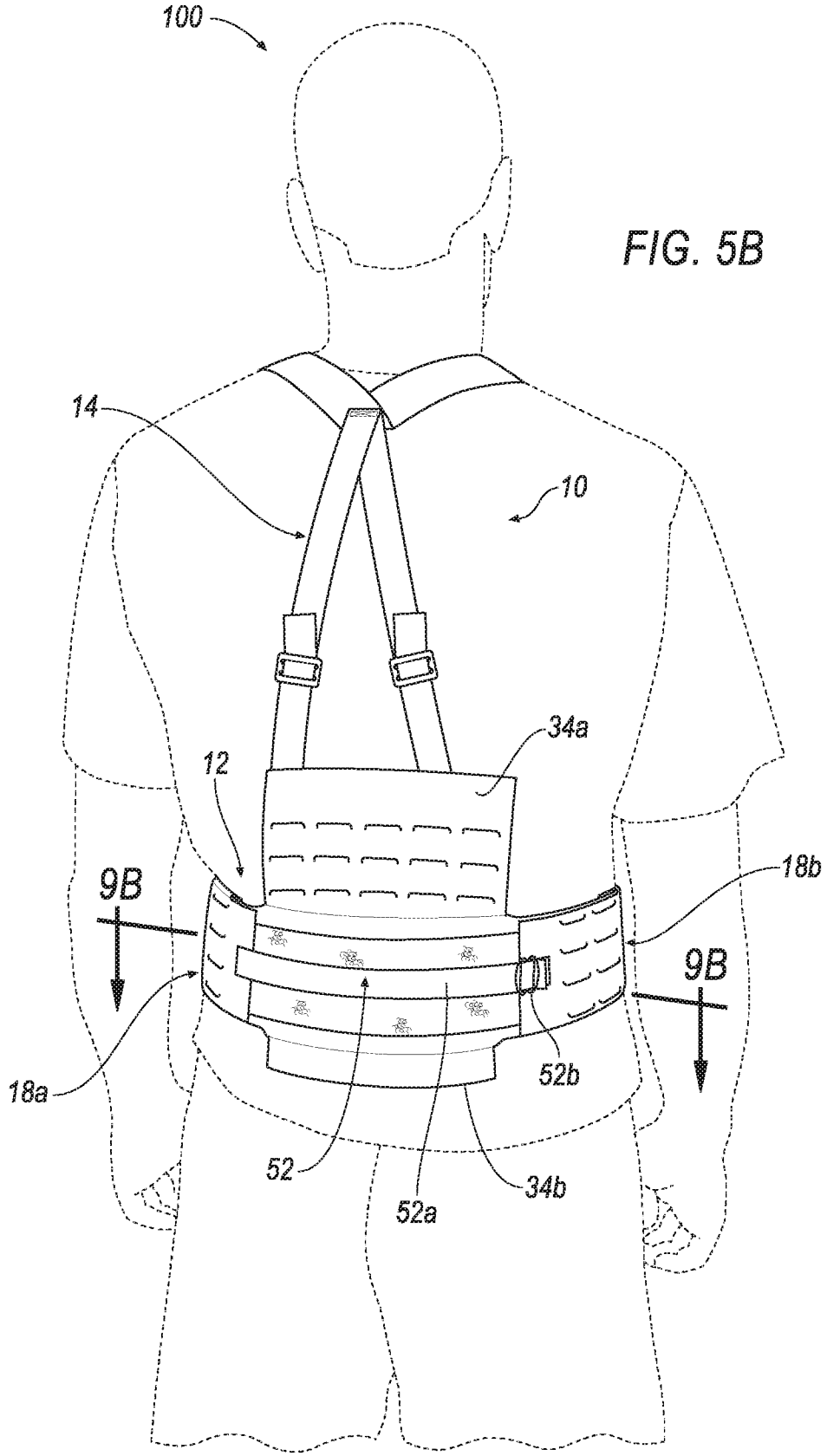
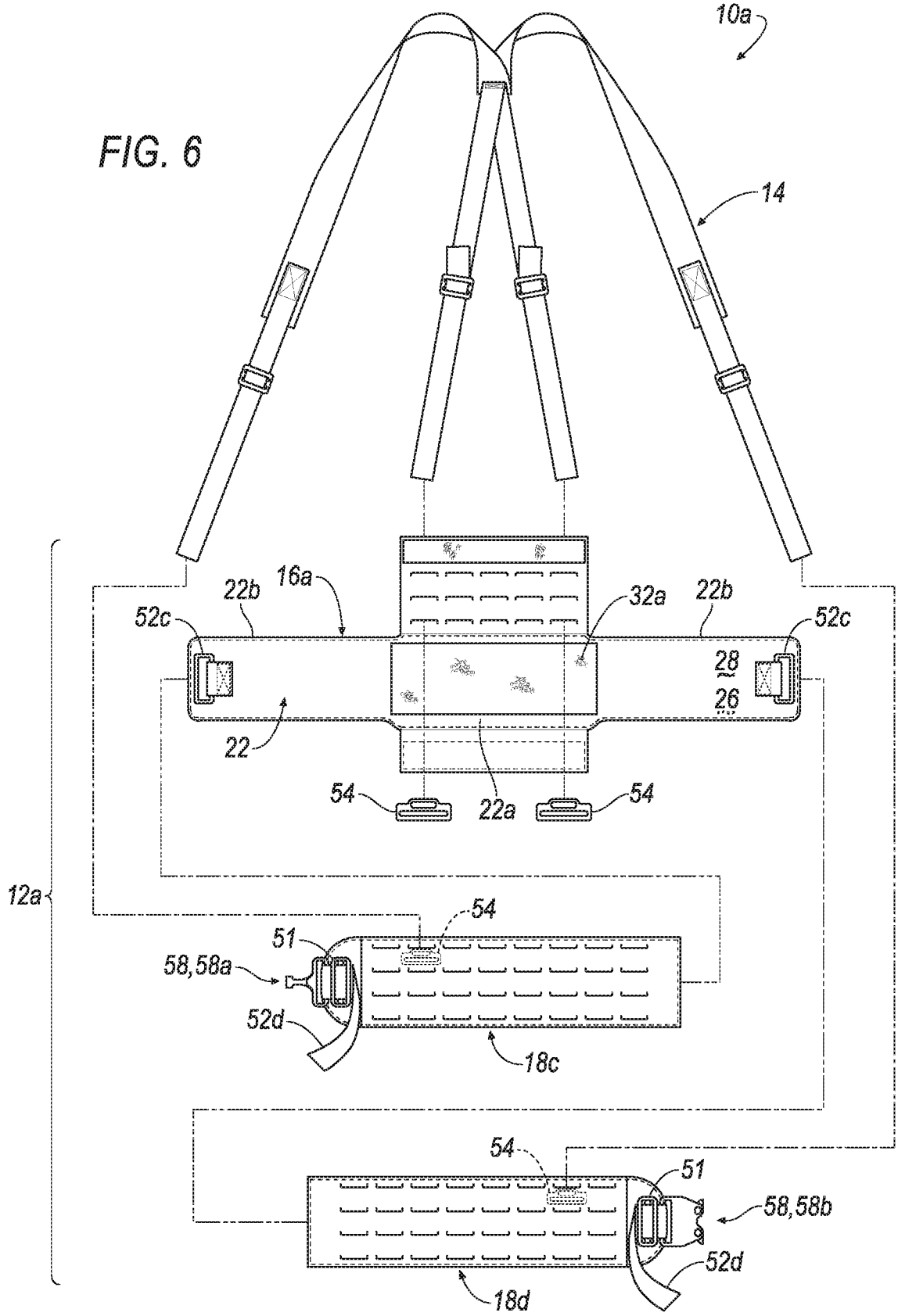


FIG. 5B

FIG. 6


10a
14
22b
16a
32a
22b
52c
52c
28
26
22
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22a
54
12a
54
51
58,58a
52d
18c
54
51
58,58b
52d
18d

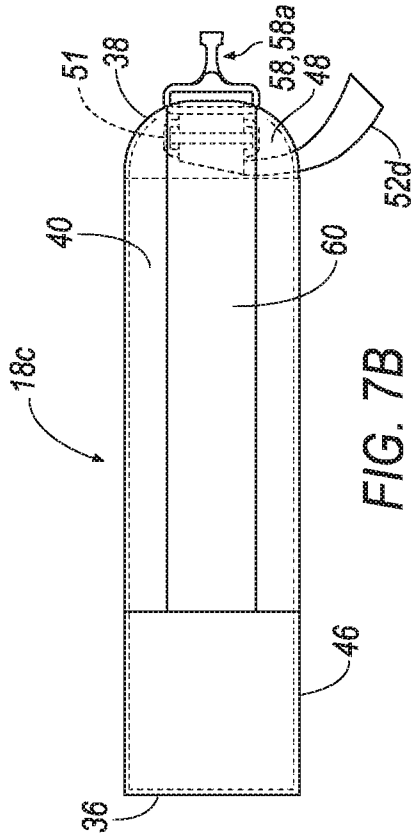


FIG. 7B

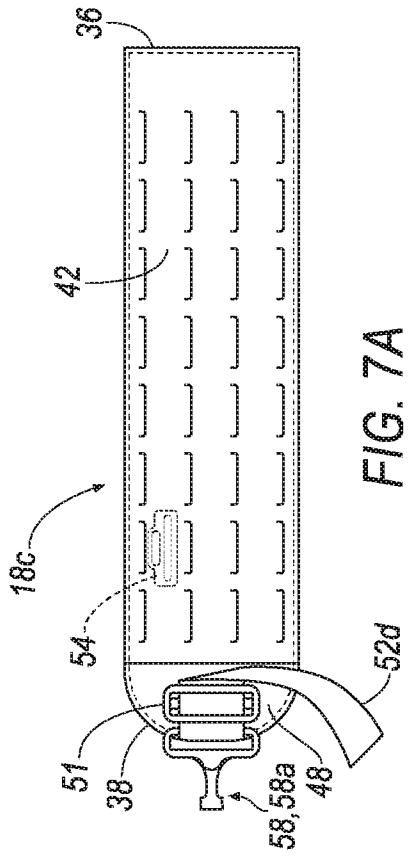


FIG. 7A

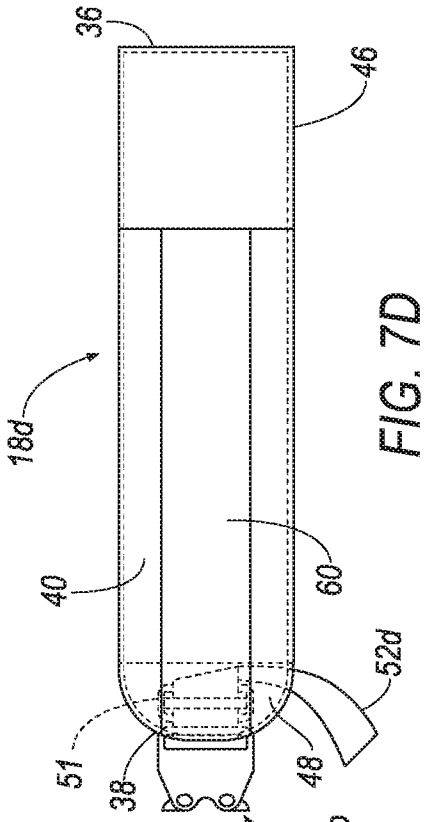


FIG. 7D

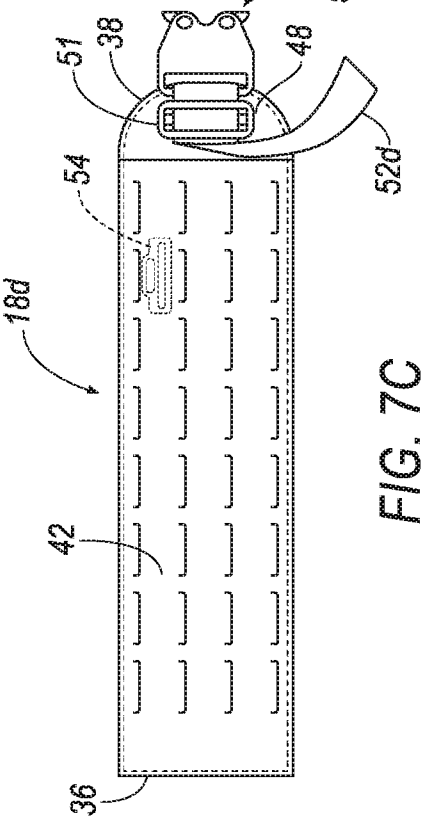


FIG. 7C

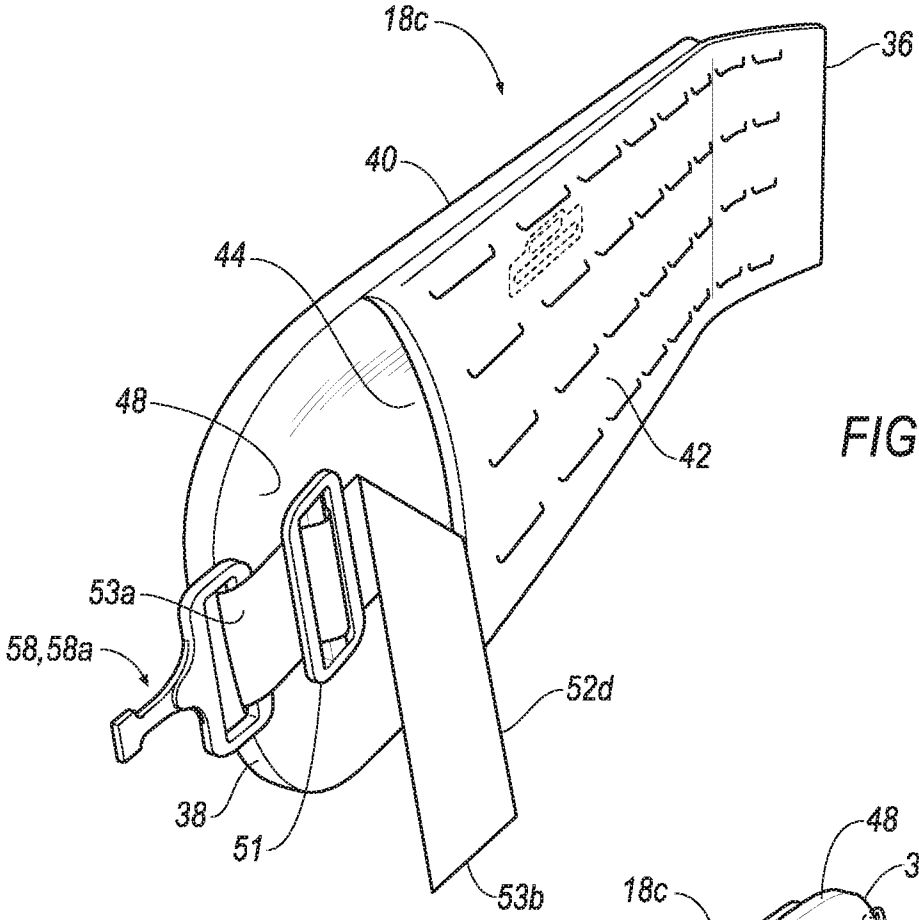
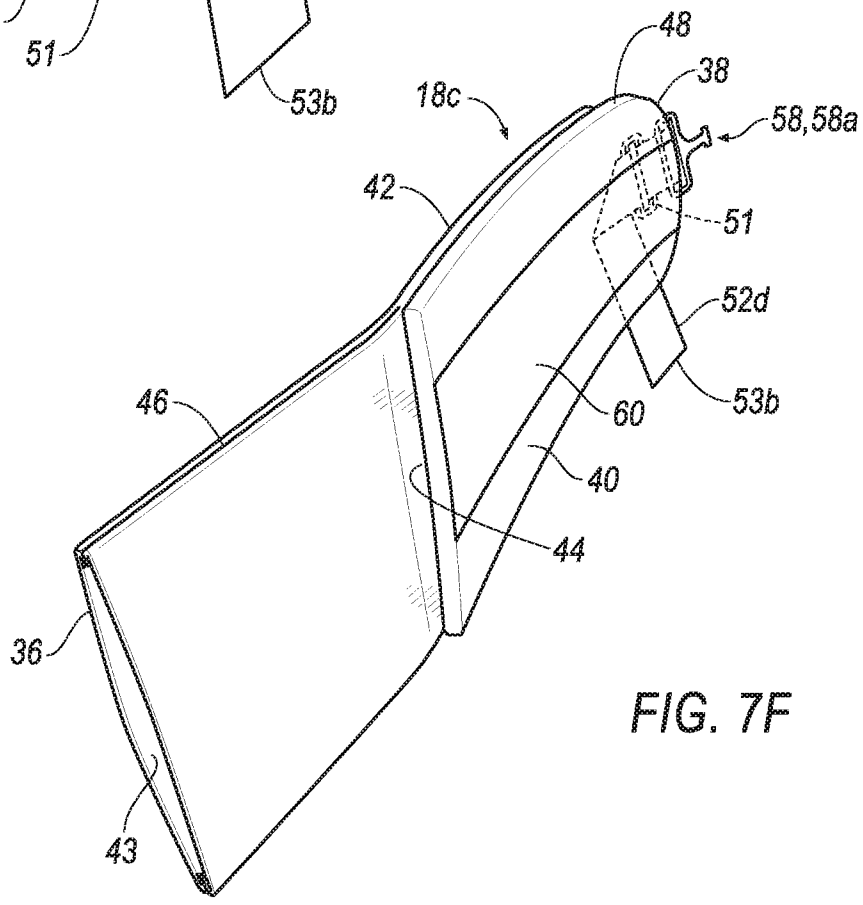

18c
36
40
44
48
42
53a
58,58a
52d
38
51
53b

FIG. 7E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38
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18c
42
51
52d
46
60
53b
40
44
36
43

FIG. 7F

FIG. 8A

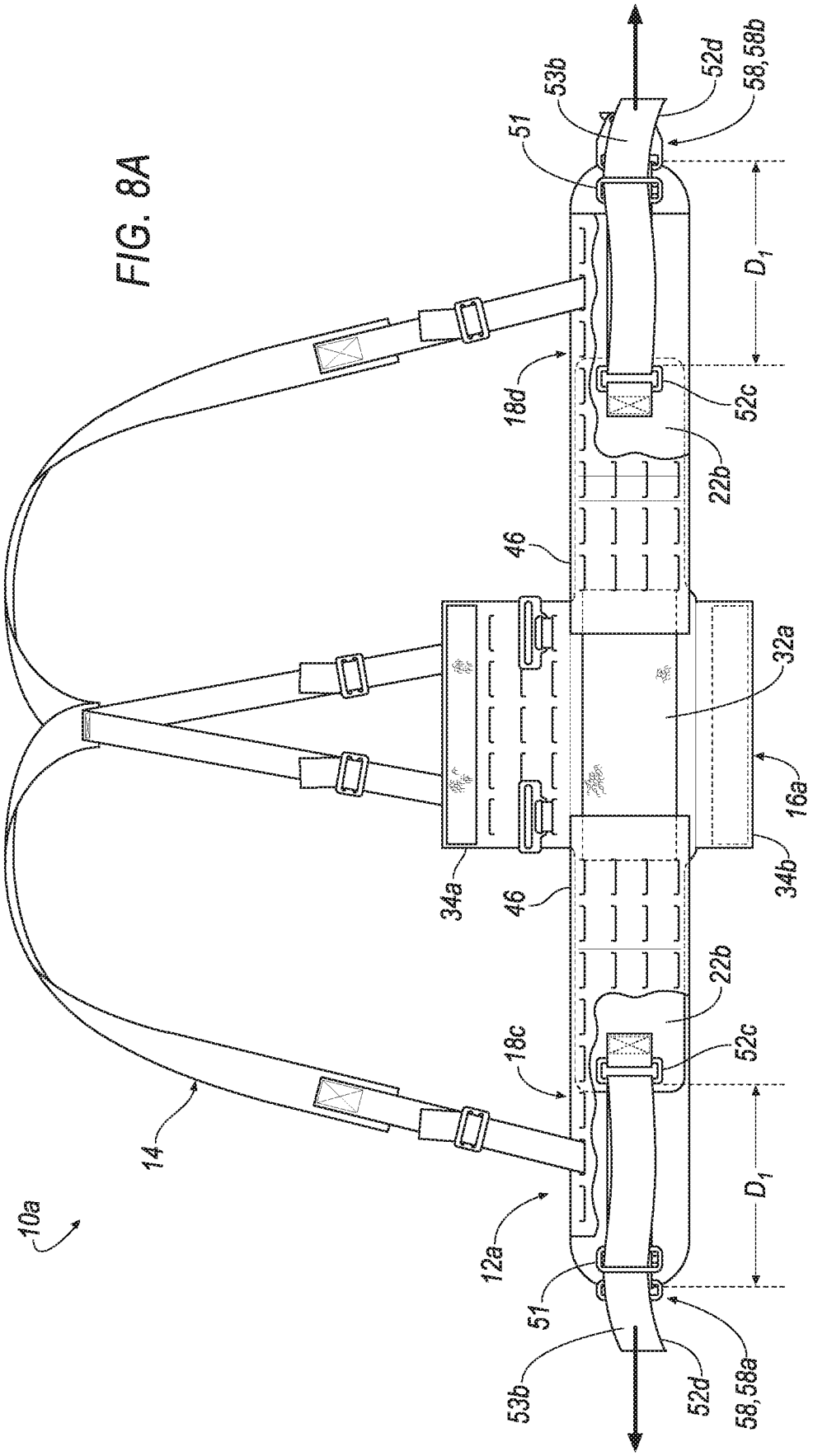
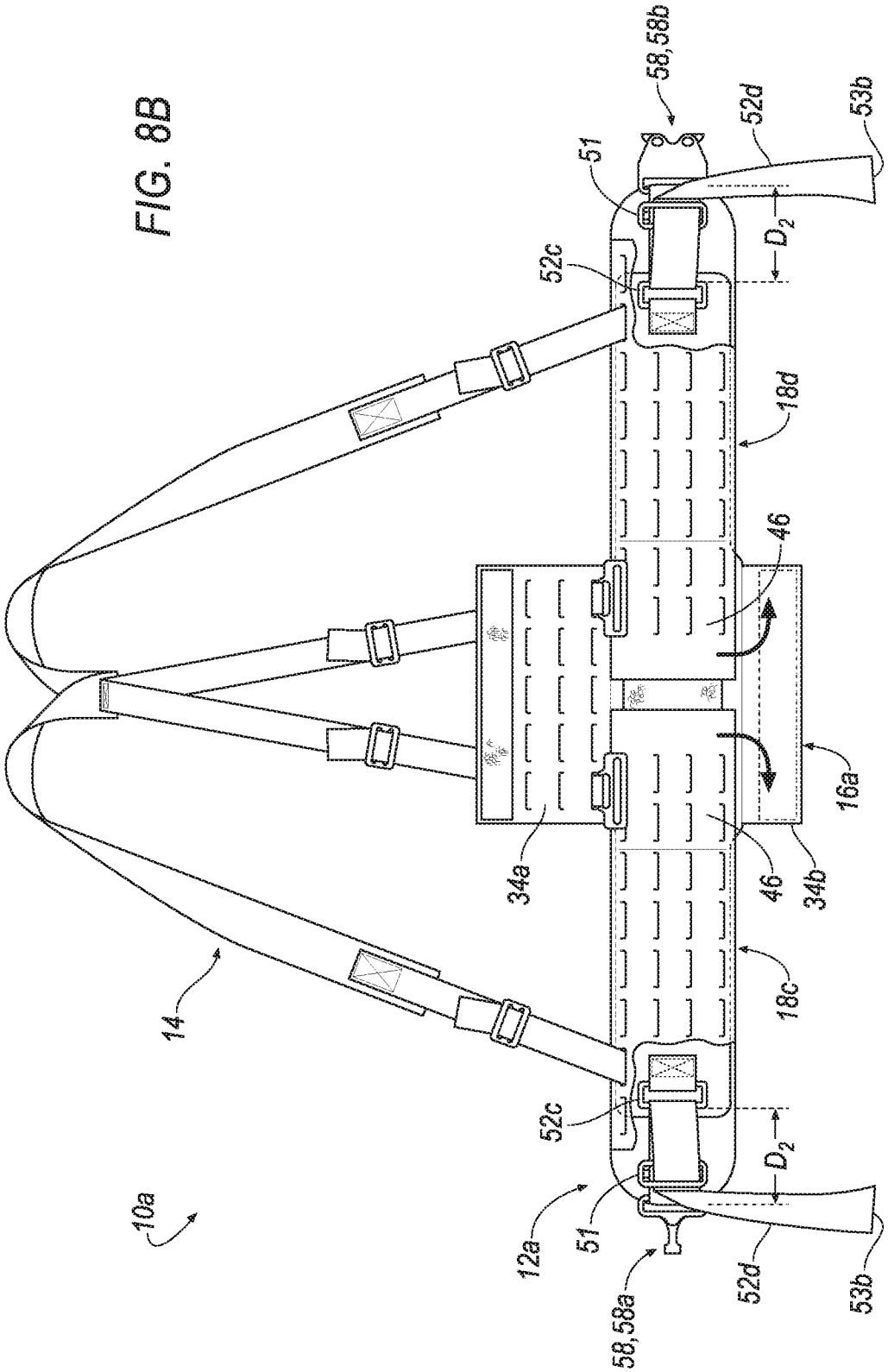

10a
14
12a
18c
18d
22b
22b
46
46
32a
16a
34a
34b
51
51
52c
52c
52d
52d
53b
53b
58,58b
58,58a
D_1
D_1

FIG. 8B


58, 58b
52d
53b
51
D_2
52c
18d
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16a
34a
46
34b
18c
14
52c
D_2
10a
12a
51
52d
53b
58, 58a

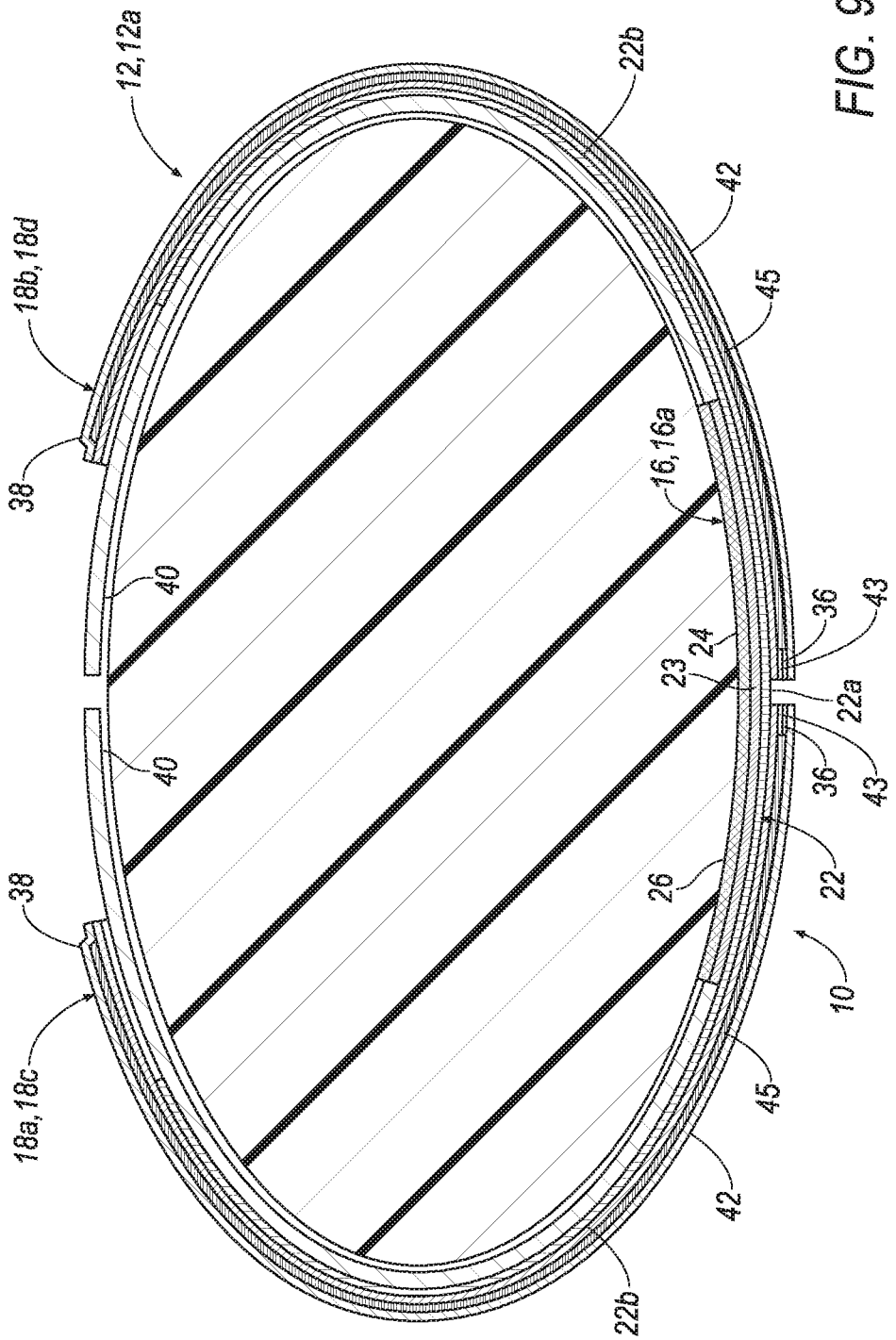
12,12a
22b
42
45
18b,18d
16,16a
38
40
36
43
24
23
22a
22
26
10
18a,18c

FIG. 9A

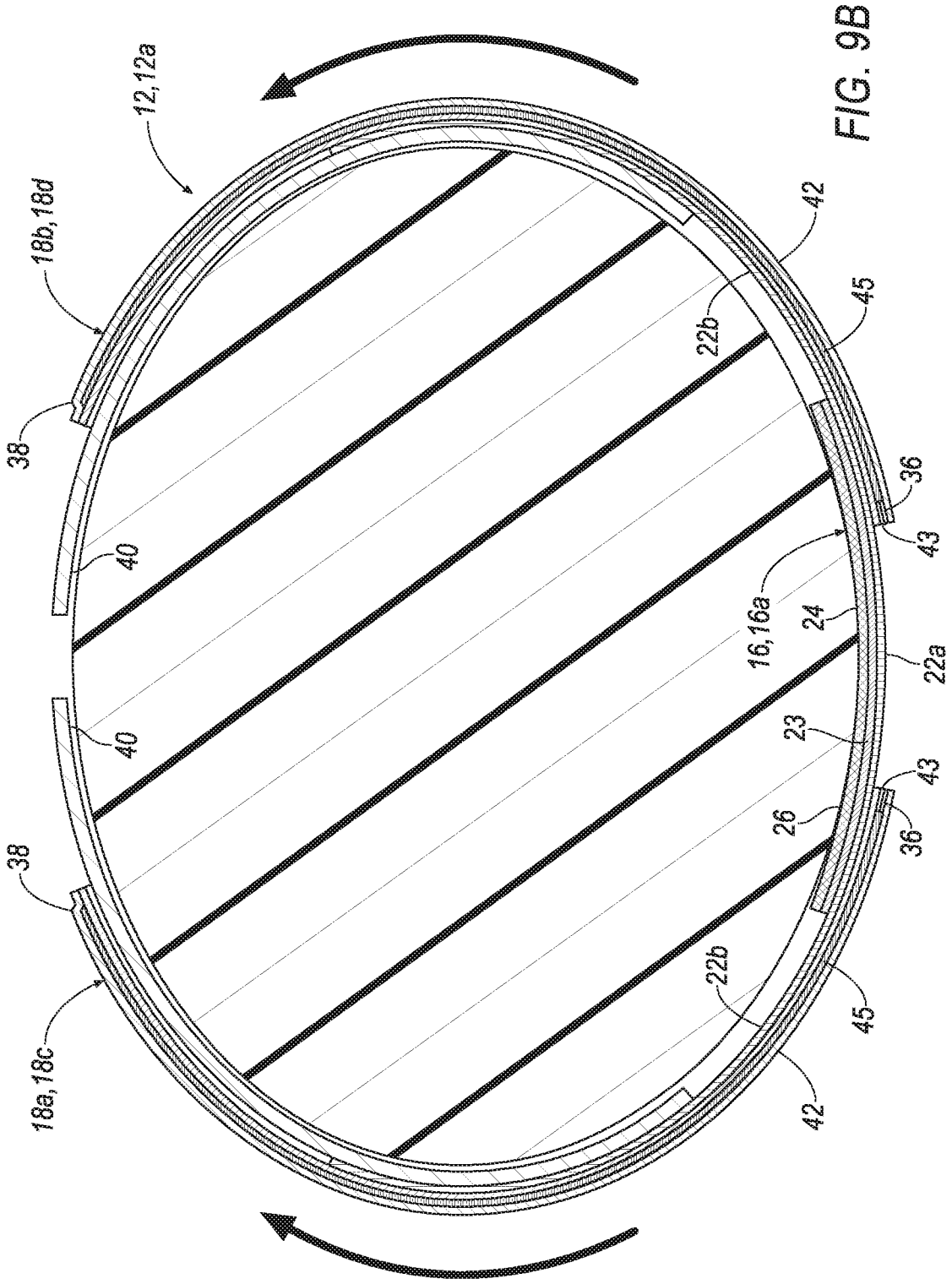
12,12a
18b,18d
38
40
40
38
18a,18c
42
22b
45
36
43
16,16a
24
22a
23
43
26
36
22b
45
42

FIG. 9B

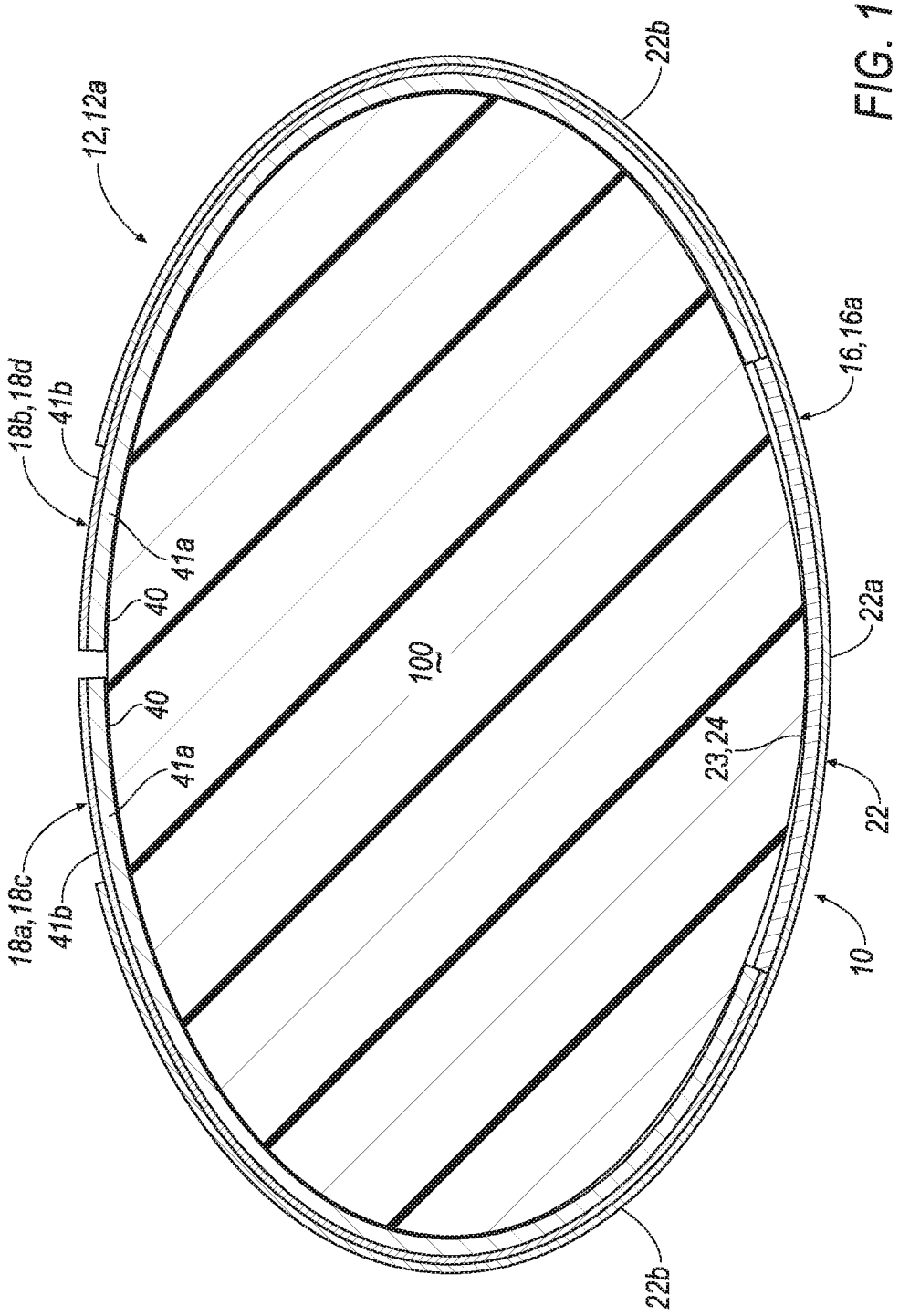
12,12a
22b
16,16a
18b,18d
41b
41a
40
100
40
41a
22a
23,24
22
18a,18c
41b
10
22b

FIG. 10A

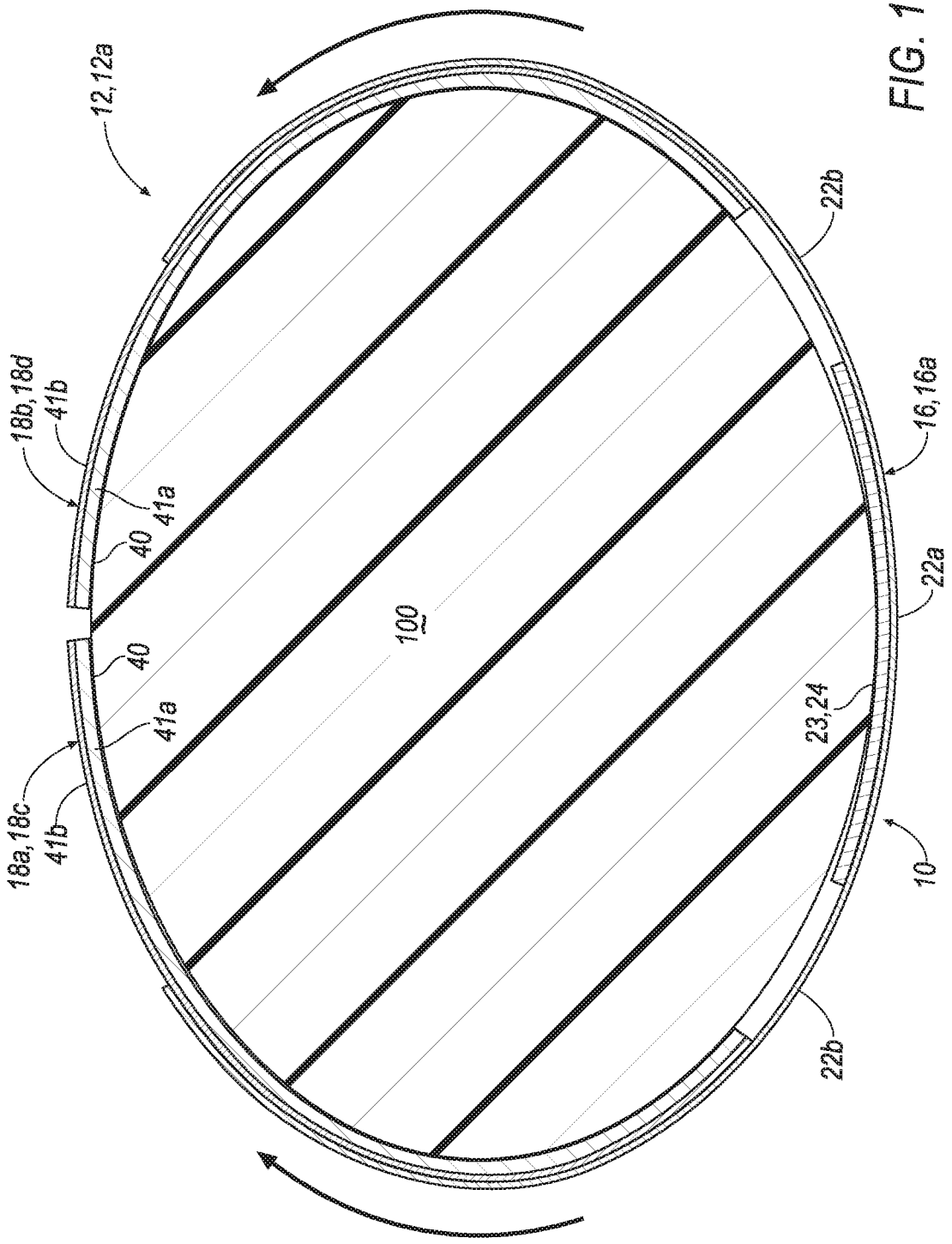
12,12a
22b
18b,18d
41b
16,16a
41a
40
22a
100
40
41a
23,24
18a,18c
41b
10
22b

FIG. 10B

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/061224

A. CLASSIFICATION OF SUBJECT MATTER

F41H 1/02(2006.01)i, A41D 13/05(2006.01)i, A41D 27/22(2006.01)i, A41D 1/04(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F41H 1/02; A41D 13/00; A41F 9/00; A41F 9/02; A45F 5/02; A61F 5/00; A61F 5/02; A41D 13/05; A41D 27/22; A41D 1/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: adjustable, belt, wing, extension, conduit, ballistic, velcro and shoulder strap

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2017-0065067 A1 (ATLAS 46, LLC) 09 March 2017 See paragraphs [0040]-[0049], [0062]; claim 1; and figures 1-8.	1,6-16,20
A		2-5,17-19
Y	US 2010-0152636 A1 (PARKS, ARDITH D. et al.) 17 June 2010 See paragraphs [0017]-[0019] and figure 1.	1,6-16,20
Y	US 5548843 A (CHASE, DAVID D. et al.) 27 August 1996 See column 2, line 66 - column 3, line 9 and figure 1.	9
A	US 2011-0179553 A1 (HAZLETT, JASON) 28 July 2011 See paragraphs [0015]-[0025] and figures 1-8.	1-20
A	US 2014-0364786 A1 (UNIVERSITY BRACES, LLC) 11 December 2014 See paragraphs [0027]-[0033] and figures 1-8.	1-20

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 March 2019 (12.03.2019)	**12 March 2019 (12.03.2019)**

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2018/061224

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2017-0065067 A1	09/03/2017	US 10051948 B2	21/08/2018
US 2010-0152636 A1	17/06/2010	None	
US 5548843 A	27/08/1996	None	
US 2011-0179553 A1	28/07/2011	US 8635714 B2	28/01/2014
US 2014-0364786 A1	11/12/2014	CN 104758107 A TW 201526859 A	08/07/2015 16/07/2015