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(54) **HYDRATION PACK**

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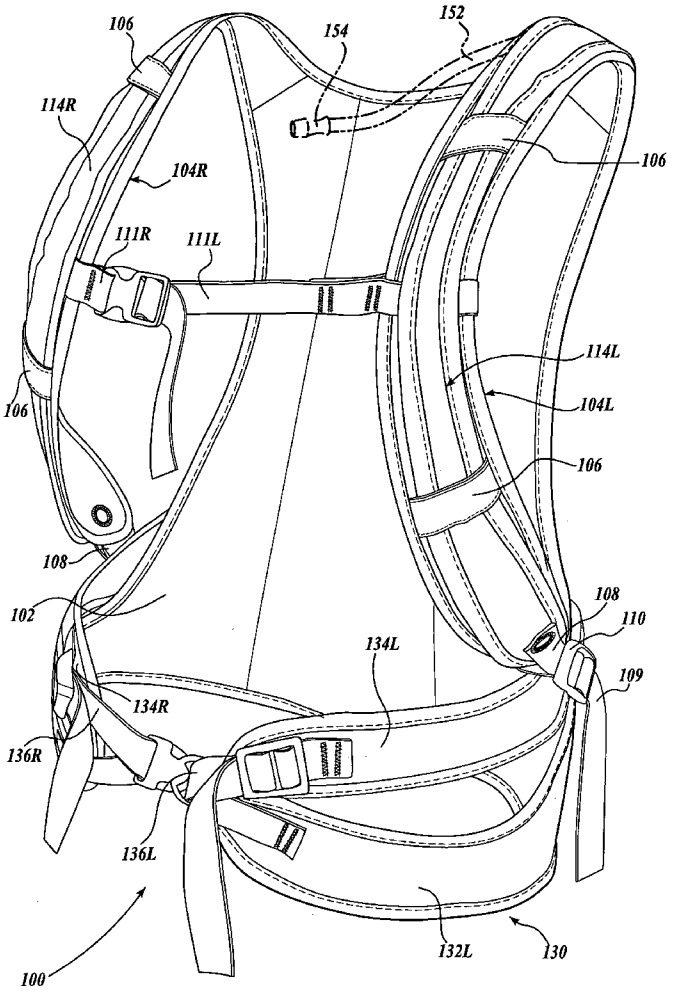
(57) **ABSTRACT**

A hydration pack is disclosed including a backpack (**100**), a bladder assembly (**150**), and a split belt assembly (**130**). The backpack includes a front panel (**102**) and a back panel (**112**) that are interconnected with baffle panels (**140**) to define a volume for receiving the bladder (**151**) of the bladder assembly. The split belt includes a lower belt portion (**132**L, **132**R) and an upper belt portion (**134**L, **134**R). The upper belt portion extends behind the backpack, over the bladder, thus compressing the fluid bladder and prevents it from shifting. In the disclosed embodiment, the split belt includes an elastic portion (**138**) that is retained in a keeper (**139**) disposed on the back panel. The back panel includes elongate straps (**114**L, **114**R) that are slidably retained along the shoulder straps. A cover (**120**) is attached to the front panel and is attachable to the back panel.



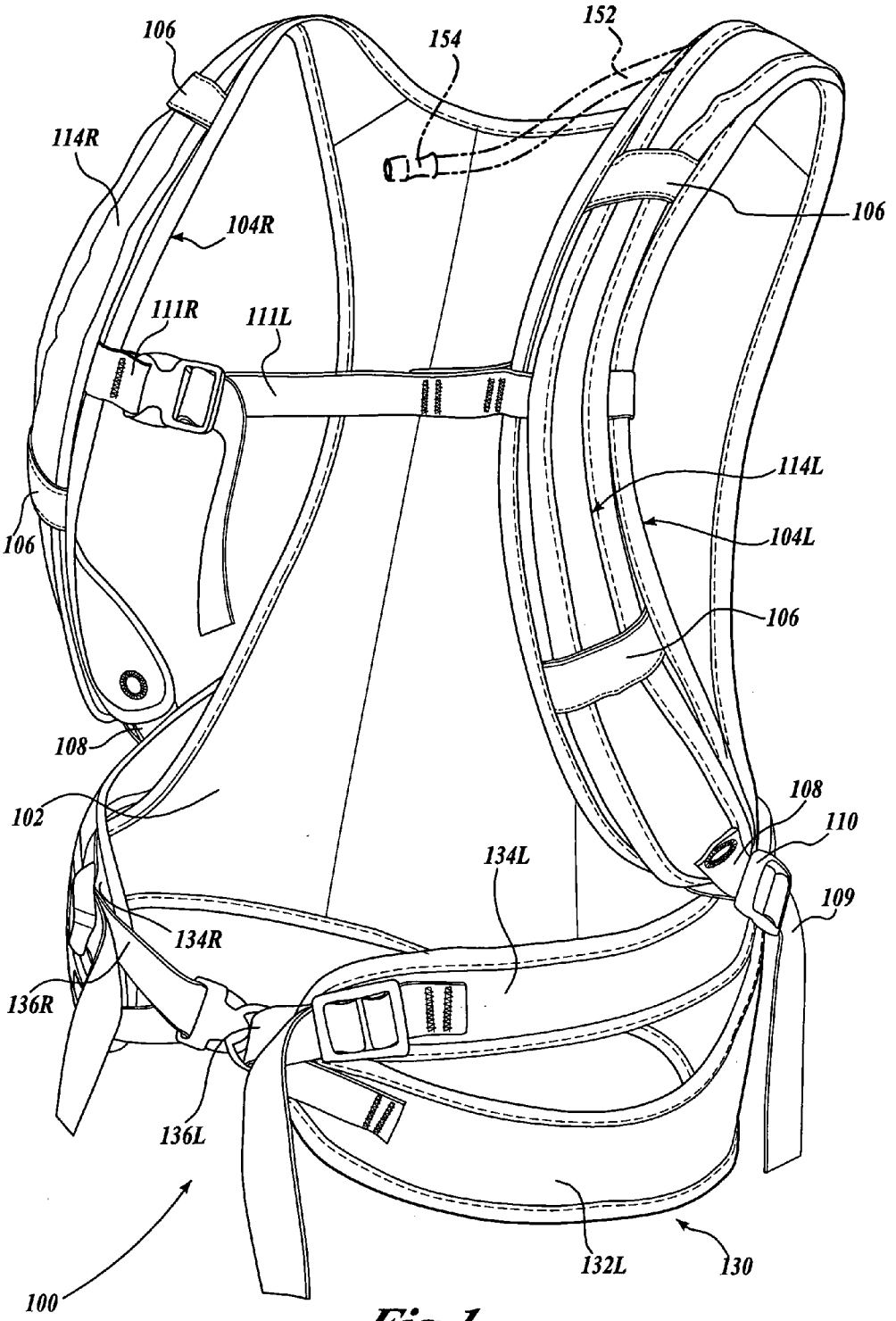

106
154
152
114R
104R
106
111R
111L
114L
106
104L
106
108
102
108
110
134L
109
134R
136R
136L
100
132L
130

Fig. 1.

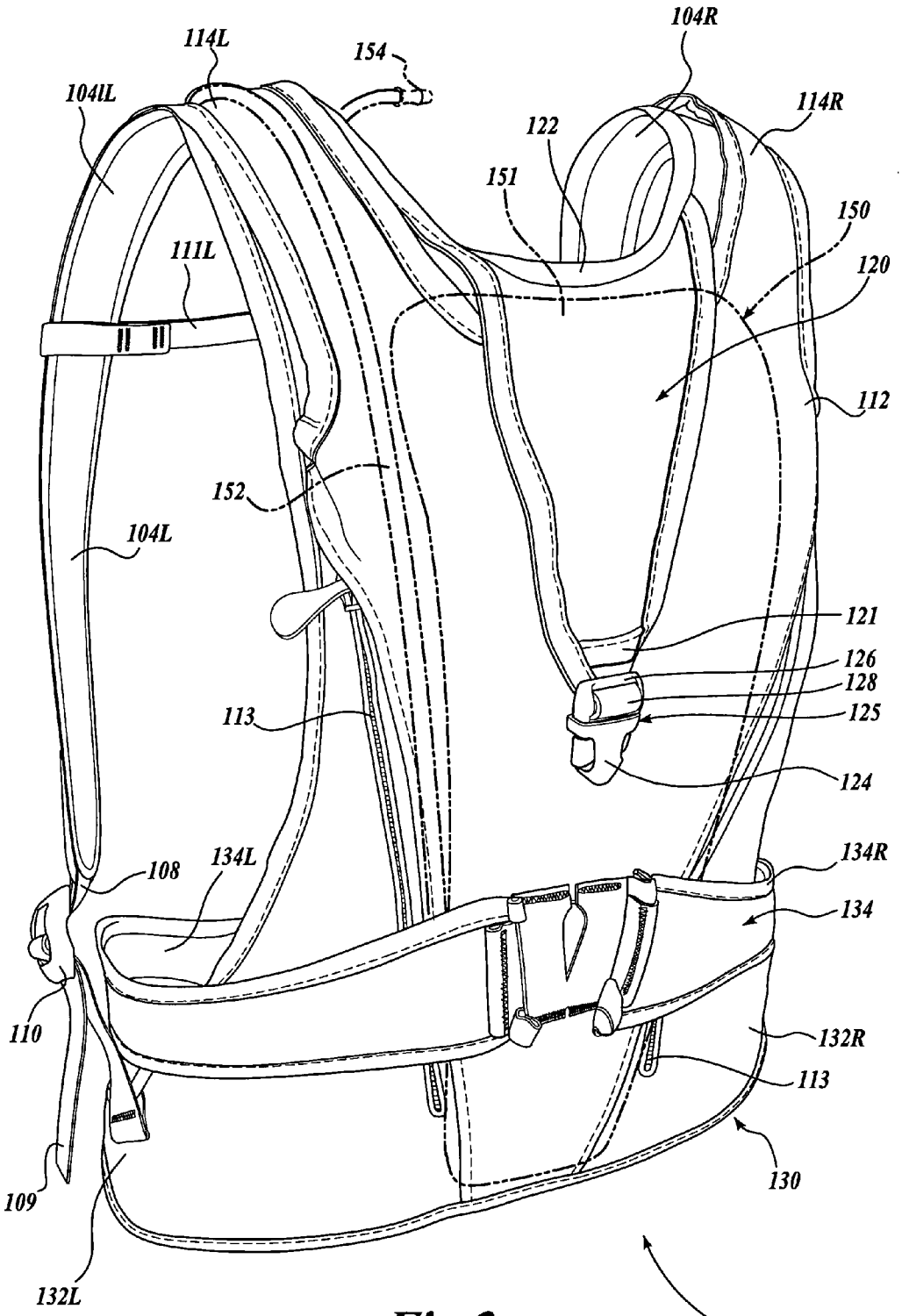
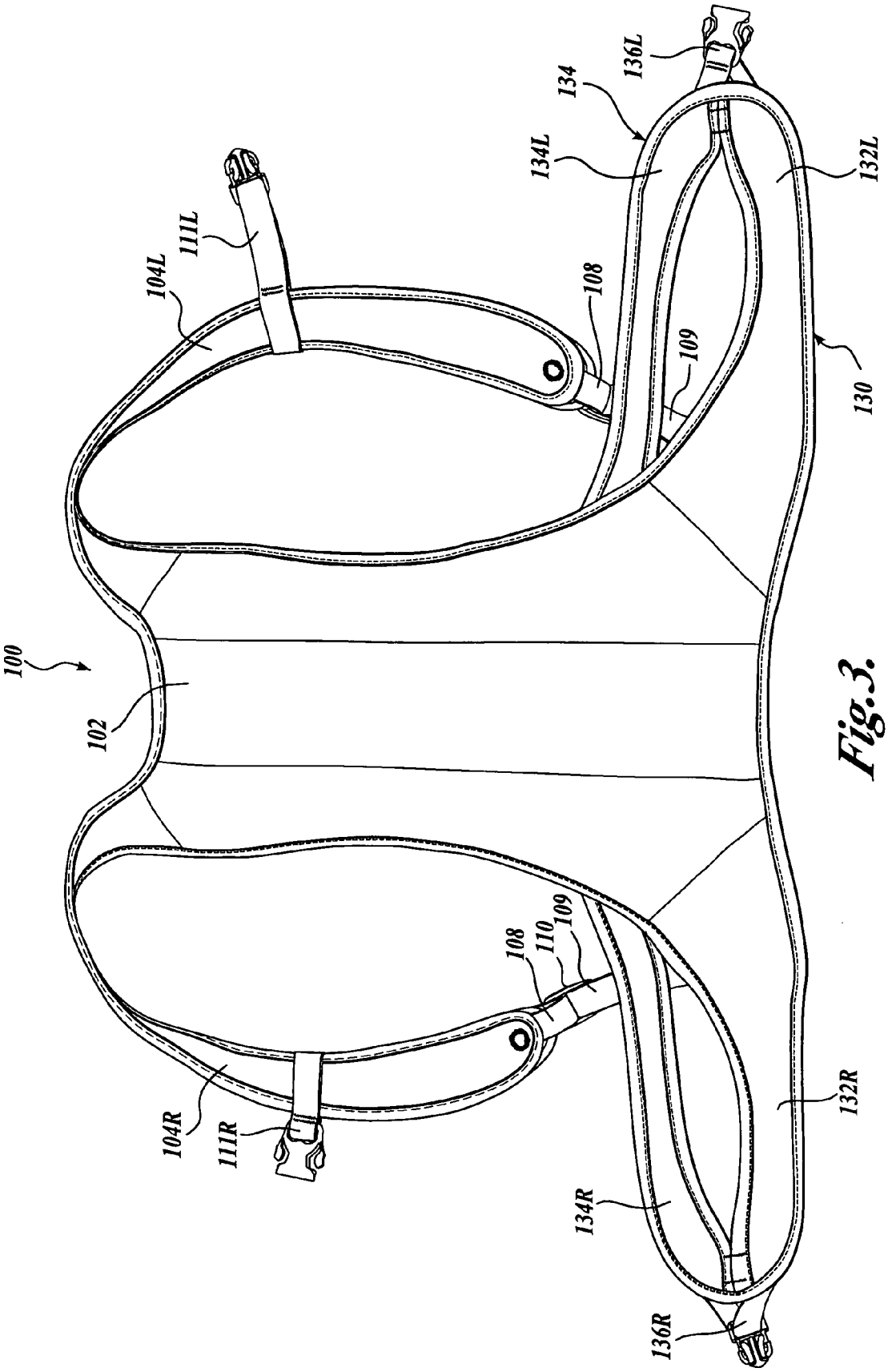

104R
114L
154
104lL
114R
122
151
150
111L
120
112
152
104L
121
126
128
113
125
124
134L
134R
108
134
110
132R
113
130
109
132L
100

Fig.2.


100
102
104L
111L
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111R
108
109
110
134
134L
134R
136L
136R
130
132L
132R

Fig. 3.

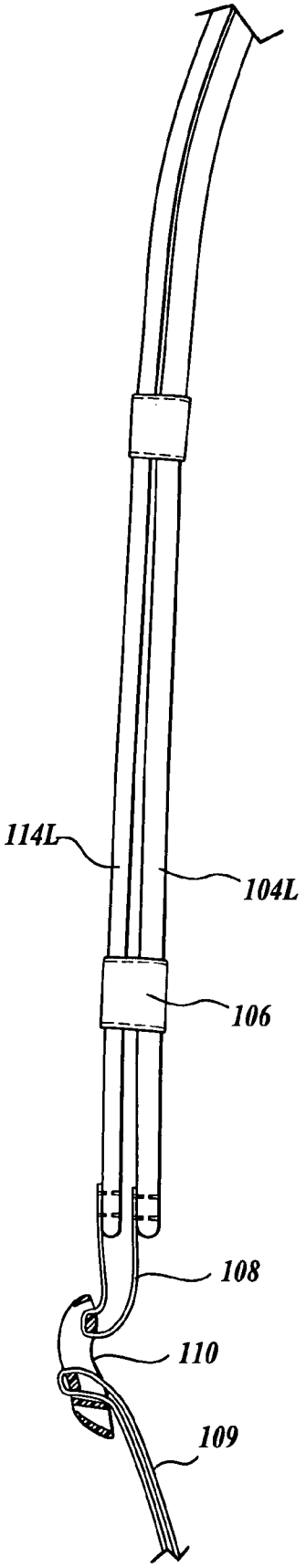

Fig. 4.

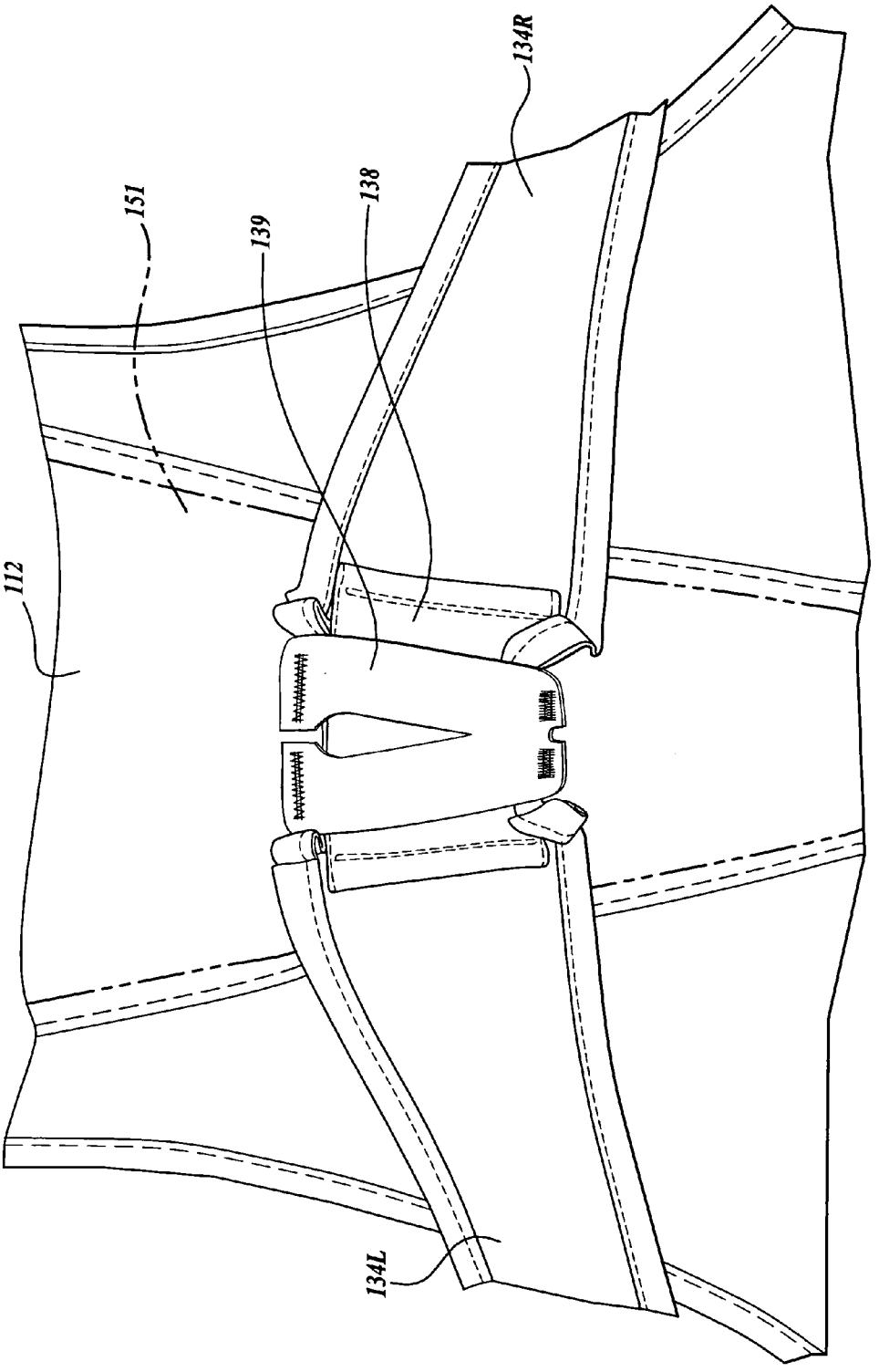

Fig. 5A.

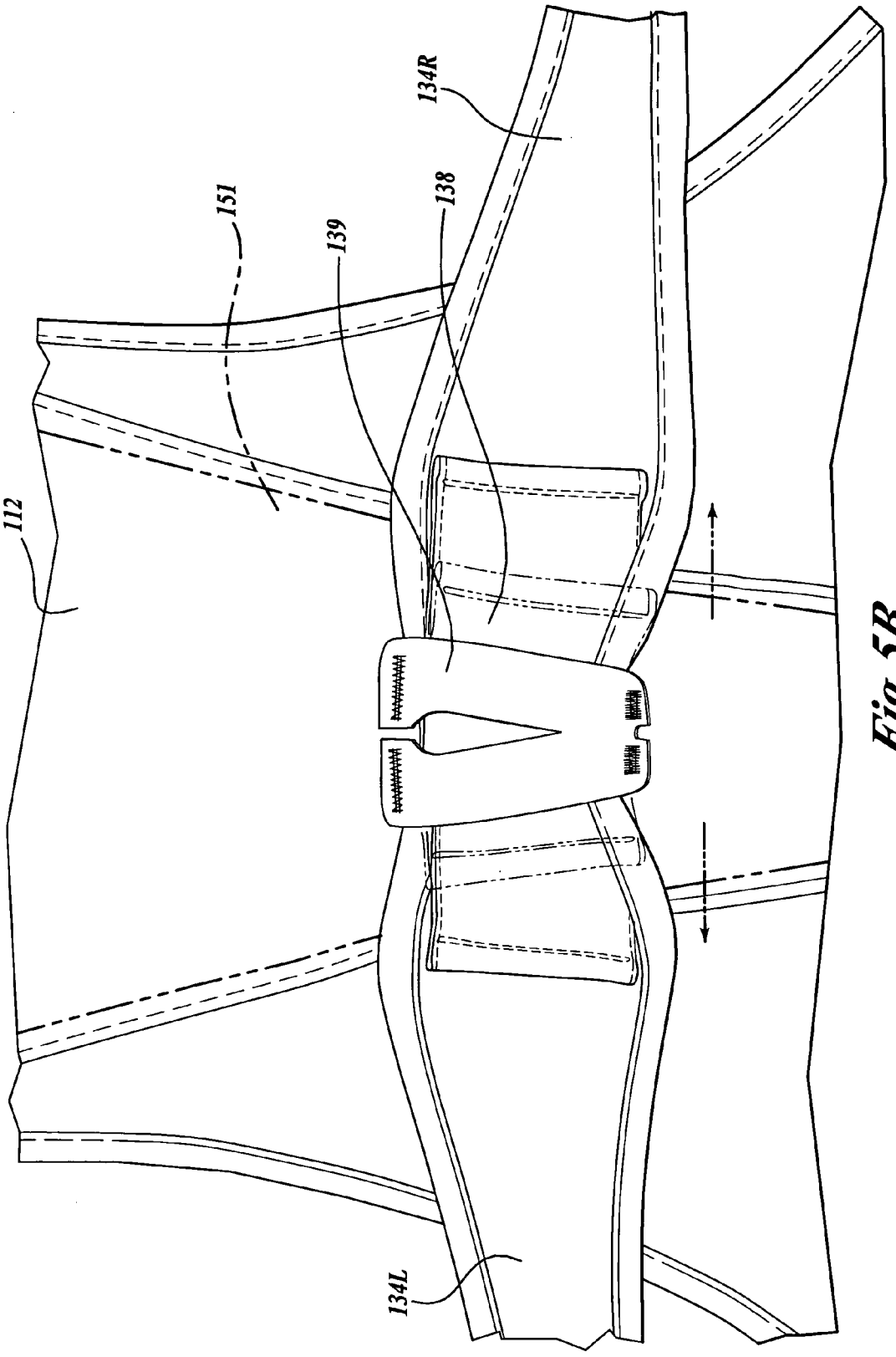

Fig. 5B.

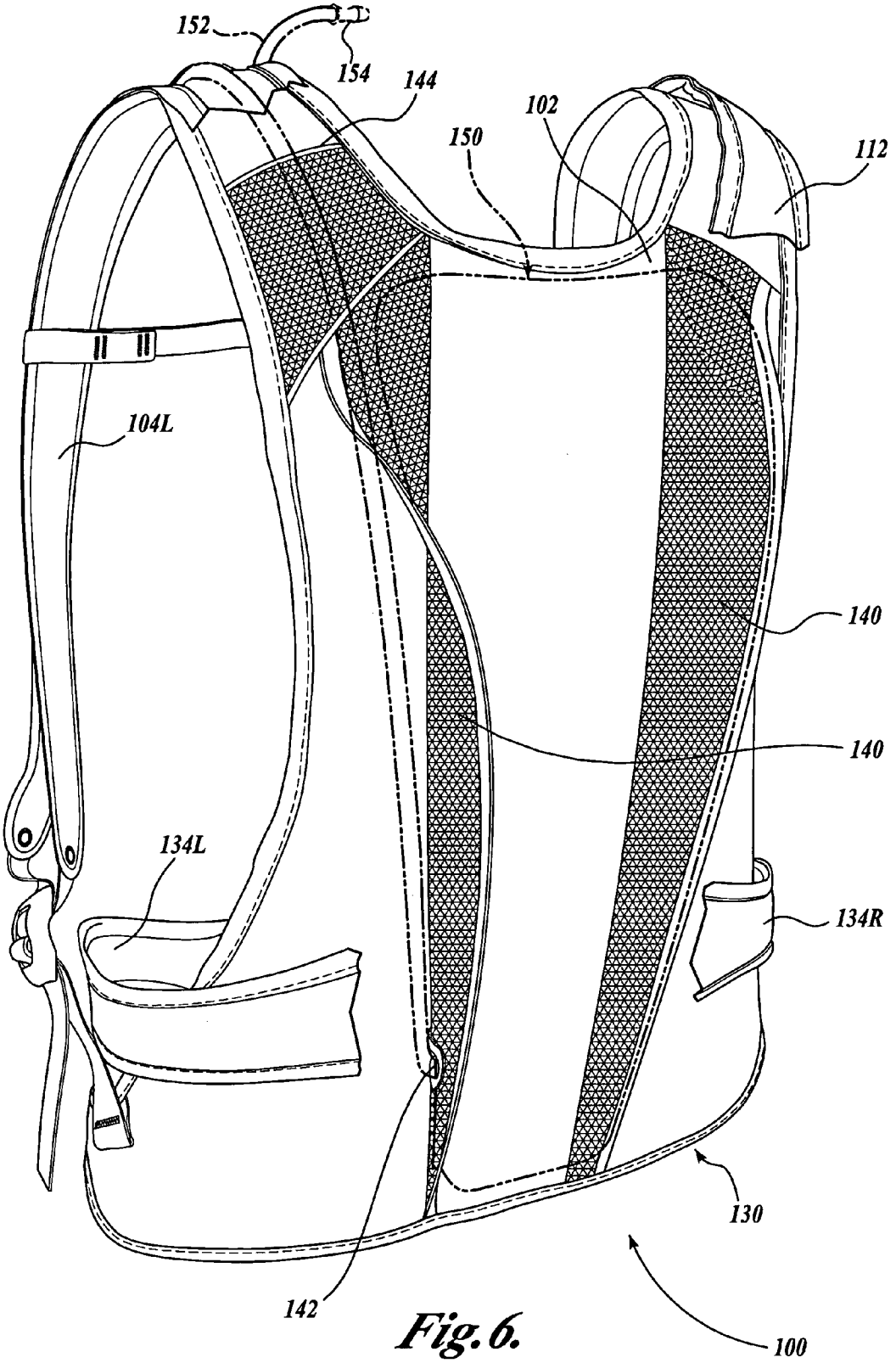

Fig. 6.

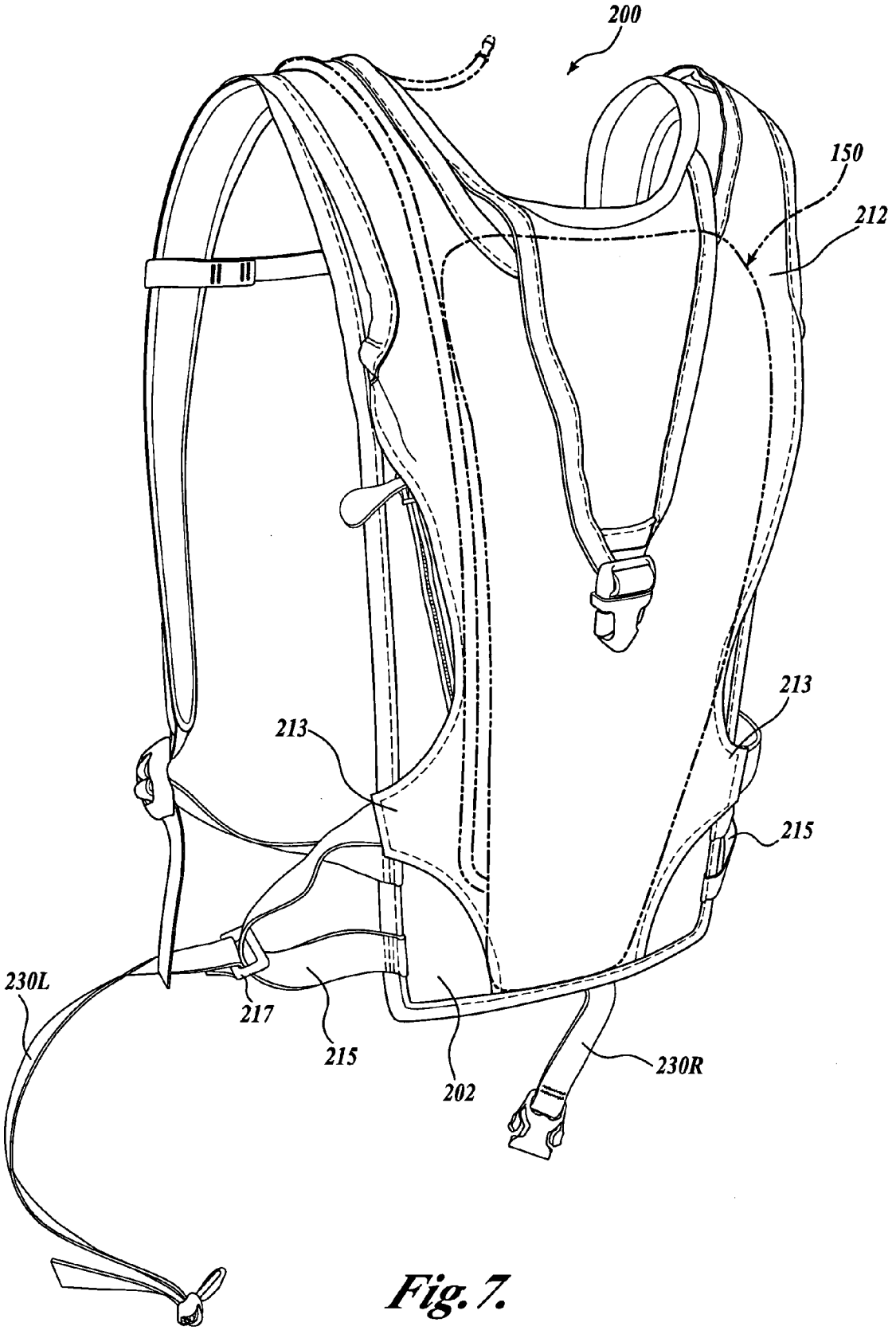

Fig. 7.

HYDRATION PACK

FIELD OF THE INVENTION

[0001] The present invention relates to the field of backpacks and, in particular, to hydration packs suitable for use while engaged in a vigorous activity.

BACKGROUND OF THE INVENTION

[0002] It is important for athletes to replenish lost fluids and/or nutrients when engaging in strenuous activities over an extended period of time. Athletes engaging in outdoor activities often carry water or other beverages in handheld containers such as canteens or water bottles. The containers may be carried by the user in a conventional backpack, fanny pack, belt attachment, or the like. Such handheld containers have certain disadvantages. For example, the quantity of fluid that can be conveniently carried is limited. It may also be inconvenient or impossible to use such containers without stopping the user's primary activity, such as biking. For example, the user may have to remove a backpack or other carrier to access the container. Also, such hand-carried containers may be dropped and damaged or set down and inadvertently left behind.

[0003] To overcome many of these problems, backpacks, commonly referred to as hydration packs, have been specially adapted to hold and dispense a fluid-typically, water. Hydration packs have become popular with sports enthusiasts such as bicyclists, hikers, runners, skiers, orienteers, and the like. For example, U.S. Pat. No. 5,060,833, to Edison et al., discloses a "camel back" hydration system for bicyclists, the system including a flexible bladder for containing a fluid, an elongate tube that extends from the bladder to the user's mouth, and a valve disposed at the distal end of the tube. The bladder fits within a pliable backpack, and allows the user to selectively draw fluid from the bladder through the valve without stopping the user's general activity. Other examples include U.S. Pat. No. 5,427,290, which discloses a water pouch backpack including a bladder pack adapted to fit within the body of a pack having shoulder straps and a hip strap, and U.S. Pat. No. 6,422,439, which discloses a combination backpack and hydration pack wherein a hydration pack is provided that releasably engages a backpack portion such that a user may use the hydration pack alone or as the combination.

[0004] While conventional hydration pack systems overcome many of the disadvantages of hand-carried water containers, they can be difficult to carry and/or interfere with the user's performance and enjoyment of the sport. In particular, when a user is engaged in relatively vigorous activity while carrying a consumable fluid, it is desirable that the fluid reservoir be maintained closer to the user's body and be relatively stable with respect to the user to avoid or mitigate undesirable stresses on the user. However, stabilizing the apparatus may be particularly difficult for hydration packs because the water is contained in a pliable bladder, typically disposed in a flexible carrier, and the momentum of the water generated during activities tends to cause the apparatus to shift about. Even when stationary, the weight of the water tends to cause the bladder to sag outwardly, away from the user. Moreover, as the fluid is consumed, the fluid level changes—which may enhance the tendency of the water to slosh around within the bladder and the bladder to shift within the backpack. Especially during vigorous activities, the bladder and/or backpack may shift about on the back of the user.

[0005] It would therefore be beneficial to provide a hydration pack wherein the hydration pack and, in particular, the bladder carrying the fluid are stable and comfortably disposed in the backpack portion of the apparatus.

SUMMARY OF THE INVENTION

[0006] A backpack adapted for carrying and dispensing a fluid (or hydration pack) is described herein that is particularly suited to use while engaged in a relatively vigorous activity. The hydration pack is adapted to hold the contained fluid securely and close to the user's back to prevent the generation of undesirable stressors on the user. The backpack includes a bladder assembly including a bladder and an elongate tube with a valve. The bladder assembly is removably insertable into a backpack having a front panel, back panel, and first and second side panels defining a volume for receiving the bladder. Left and right shoulder straps are attached to the front panel of the backpack and a split belt adapted to be fastened about the user's waist is provided. The split belt includes a first strap attached to the front panel of the backpack and a second strap that extends over the back panel of the backpack to hold the backpack and bladder close to the user.

[0007] In an embodiment of the invention, the shoulder straps and the lower strap of the split belt are an integral portion of the backpack front panel.

[0008] In an embodiment of the invention, the split belt upper strap includes an elastic portion that is slidably retained in a keeper on the backpack back panel.

[0009] In an embodiment of the invention, the volume for receiving the bladder is open at the top and a cover panel is fixedly attached to a top edge of the front panel and is releasably attachable to the back panel of the backpack to substantially cover the open top of the volume.

[0010] In an embodiment of the invention, the back panel of the backpack includes a pair of elongate straps that are slidably retained in keepers on the shoulder straps.

[0011] In an embodiment of the invention, a releasable chest strap is provided that releasably joins the left and right shoulder straps.

[0012] In an embodiment of the invention, the upper strap of the split belt applies a pressure to the bladder when the split belt is fastened about the waist of the user and holds the bladder adjacent the user's back.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The foregoing aspects and many of the attendant advantages of this invention will become more readily appreciated as the same become better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

[0014] **FIG. 1** is a three-quarter front perspective view of an embodiment of a hydration pack in accordance with the present invention;

[0015] **FIG. 2** is a three-quarter rear perspective view of the hydration pack shown in **FIG. 1**;

[0016] **FIG. 3** is a front view of the hydration pack shown in **FIG. 1** with the hydration pack laid flat;

[0017] **FIG. 4** is a fragmentary view of a portion of the hydration pack of **FIG. 1** showing the attachment at the lower portion of the shoulder strap;

[0018] **FIGS. 5A and 5B** show a fragmentary view of the rear of the hydration pack shown in **FIG. 1**, showing the attachment and stretching of the upper portion of the split belt in this embodiment—**FIG. 5A** showing the unstretched belt and **FIG. 5B** showing the stretched belt;

[0019] **FIG. 6** is a partially cut-away perspective view of the hydration pack shown in **FIG. 1**; and

[0020] **FIG. 7** is a three-quarter rear perspective view of an alternative embodiment of a hydration pack in accordance with the present invention, utilizing a simplified belt structure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0021] A currently preferred embodiment of the present invention will now be described in detail with reference to the figures, wherein like numbers indicate like parts.

[0022] **FIG. 1** shows a three-quarter front perspective view of an embodiment of a hydration pack **100** in accordance with the present invention, and **FIG. 2** shows a three-quarter rear perspective view of the hydration pack **100**. A front view of the hydration pack **100**, laid out generally flat to more clearly show various aspects of the hydration pack **100**, is shown in **FIG. 3**. The hydration pack **100** includes a front panel **102** that is generally adapted to be disposed adjacent the user's back (not shown) during use, and a back panel **112** that is attached to, and generally overlies, the front panel **102**. The front panel **102** and back panel **112**, partially defining a volume, are open at the top for receiving a bladder assembly **150** (shown in phantom in **FIG. 2**). The front panel **102** is preferably made, at least in part, from a relatively soft and porous or breathable material to enable some airflow between the user and the hydration pack **100** and may include, for example, a plurality of small holes and/or elongate channels to promote air circulation between the user and the hydration pack **100**. The front panel **102** may also include padding (not shown) to enhance user comfort.

[0023] The back panel **112** may be made from a pliable and sturdy material, either natural or manmade, such as nylon, polytetrafluoroethylene (such as Gortex™), denim, or other suitable material. The back panel **112** and front panel **102** are preferably connected with stitching, although other attachment methods alternatively may be used as are well known in the art. In addition, although the volume between the front panel **102** and back panel **112** is preferably open at the top, alternative or additional access apertures may be provided. For example, one or more releasable fasteners, such as zipper assemblies **113**, may allow access to at least a portion of the volume between the front panel **102** and the back panel **112**.

[0024] The bladder assembly **150** (shown in phantom in **FIG. 2**) preferably includes a pliant bladder **151** fluidly connected to an elongate tube **152** having a distal valve **154**, such as a bite valve. The particular details of the bladder assembly **150** are not important to the present invention, and various general aspects of bladder assemblies are well known. The bladder assembly **150** may be any conventional design as is well known in the art. Representative bladder assemblies are disclosed, for example, in U.S. Pat. No. 5,941,640 and/or U.S. Pat. No. 6,722,533, the disclosure of which are hereby incorporated by reference.

[0025] As seen most clearly in **FIG. 2**, a generally triangular cover panel **120** attaches along a back edge **122** to the top of the front panel **102** and extends rearwardly over the back panel **112**. A buckle assembly **125** allows the user to releasably attach the distal end **121** of the cover panel **120** to the back panel **112**. The buckle assembly **125** of the disclosed embodiment includes a lower buckle member **124** fixedly attached to the back panel **112** and an upper buckle member **126** attached to a short strap **128** on the distal end of the cover panel **120**. It is contemplated that other releasable fastening mechanisms may alternatively be used—such as lacing, snaps, hook-and-loop materials, and the like. In the disclosed embodiment, the cover panel **120** connects the back panel **112** to the upper edge of the front panel **102**, thereby aiding in supporting the back panel **112** against the outward force resulting from the weight of the bladder **151**.

[0026] A pair of shoulder straps **104**L, **104**R extends from the front panel **102**, are adapted to aid the user in carrying the hydration pack **100** on the user's shoulders. As seen most clearly in **FIG. 3**, the shoulder straps **104**L, **104**R may be formed integrally with the front panel **102**, simplifying construction and providing a rugged product. The shoulder straps **104**L, **104**R extend generally from the top of the front panel **102** to near the bottom of the hydration pack **100**. Each of the shoulder straps **104**L, **104**R includes a plurality of keepers **106** (two shown) spaced along the shoulder straps **104**L, **104**R.

[0027] The back panel **112** includes a corresponding pair of elongate straps **114**L, **114**R, that extend over the top of the front panel **102** and are slidably retained by the keepers **106** attached to the front panel shoulder straps **104**L, **104**R. In the disclosed embodiment, the elongate straps **114**L, **114**R are formed integrally with the back panel **112**. The distal ends of each associated pair of straps **104**L, **114**L and **104**R, **114**R are connected with a relatively short connecting strap **108** that slidably engages an adjuster buckle **110**.

[0028] **FIG. 4** shows a fragmentary side view of the distal end of the shoulder strap **104**L and related structure, with the adjuster buckle **110** shown in cross-section to illustrate a particular aspect of this embodiment of the present invention. The relative position of the distal end of the shoulder strap **104**L and the distal end of the back panel strap **114**L may vary as the connecting strap **108** slides in the adjuster buckle **110**. It will now be appreciated from **FIGS. 1 and 2** that the slideable strap structure permits the back panel **112** to adjust to accommodate the varying volume of fluid in the bladder **151** as the fluid is used or replenished. For example, when the bladder **151** is substantially full, the back panel **112** will accommodate the bladder **151** as the elongate straps **114**L, **114**R slide rearwardly in the keepers **106** along the shoulder straps **104**L, **104**R. As the fluid level decreases, the elongate straps **114**L, **114**R can slide along the shoulder straps **104**L, **104**R such that the bladder **151** is maintained desirably close to the user's body.

[0029] As seen most clearly in **FIG. 2**, the adjuster buckle **110** is adjustably connected to a lower portion of the

hydration pack **100** with a lower strap **109**, such that the effective length of the lower strap **109** may be increased or decreased to achieve a comfortable fit for the user. An optional releasably-engageable chest strap having a left portion **111**L and a right portion **111**R may also be provided, extending between the shoulder straps **104**L, **104**R, to maintain the shoulder straps at a desired spacing.

[**0030**] A split belt assembly **130** extends from a lower portion of the hydration assembly **100**. The split belt assembly **130** includes left and right lower belt portions **132**L, **132**R. As seen most clearly in **FIG. 3**, the lower belt portions **132**L, **132**R may conveniently be formed as integral extensions of the front panel **102**. Alternatively, the lower belt portions may be formed separately and attached to the hydration pack **100**.

[**0031**] The split belt assembly **130** also includes an upper belt **134** having left and right upper belt portions **134**L, **134**R. The distal ends of the corresponding upper and lower belt portions—that is, **132**L, **134**L and **132**R, **134**R—are connected, for example, by stitching, as seen most clearly in **FIG. 3**. The distal ends also include an adjustable buckle assembly having releasably-engageable left and right portions **136**L, **136**R that allow the user to adjustably secure the split belt assembly **130** generally about the user's waist, as is well known in the art.

[**0032**] Referring again to **FIG. 2**, the upper belt **134** extends around and overlies a portion of the back panel **112** and the bladder assembly **150**, such that the upper belt **134** holds the lower portion of the bladder assembly **150** in close proximity to the user. The split belt **130**, therefore, prevents the lower portion of the hydration assembly **100** from excessive motion while the user is engaged in the desired activity. In particular, the upper belt **134** prevents the bladder assembly **150** from sagging outwardly from the weight of the fluid therein or from excessive motion within the volume defined by the hydration pack **100**. The upper belt **134** may also apply a pressure to the bladder assembly **150**, pressurizing the bladder to facilitate drawing fluid from the bladder assembly **150**. In the disclosed embodiment, the portion of the upper belt **134** disposed directly behind the bladder assembly **150** is relatively wide, thereby distributing the pressurizing force over a larger area.

[**0033**] Referring now to **FIGS. 5A and 5B**, the left and right upper belt portions **134**L, **134**R are interconnected with an elastic section **138** that is slidably retained by a keeper **139** attached to the back panel **112**. The elastic section **138** allows the user to adjust the split belt assembly **130** such that the upper belt **134** maintains a desired pressure on the bladder assembly **150** even as the fluid in the bladder assembly **150** is reduced over a range of fluid levels. It will be appreciated that larger or smaller elastic sections may be used to achieve a desired overall result, although user comfort considerations make it preferable that the elastic section not extend beyond the edges of the back panel **112**. **FIG. 5B** shows the elastic section **138** generally stretched out for maximum effect, as indicated by the arrows, with the unstretched elastic section **138** shown in phantom.

[**0034**] **FIG. 6** shows a three-quarter rear perspective view of the hydration pack **100** with most of the back panel **112** removed to illustrate another aspect of the present invention. In the disclosed embodiment of the hydration pack **100**, a pair of generally upright baffle panels **140** connects the front panel **102** with the back panel **112** along at least a substantial portion of the length of the hydration pack **100**. The baffle panels **140**, cooperatively with the front panel **102** and back panel **112**, define the volume that receives the baffle assembly **150** (shown in phantom). The baffle panels **140** constrain the relative motion between the front panel **102** and back panel **112**, thereby limiting the bladder assembly's **150** tendency to shift and/or sag during use of the hydration pack **100**.

[**0035**] In the disclosed embodiment, one or both of the baffle panels **140** include an aperture **142** therethrough to accommodate the elongate tube **152** of the baffle assembly **150**. The upper edge **144** of the baffle panels **140** extends to the shoulder straps **104**L, **104**R and is not stitched across at least a portion of the top, whereby the elongate tube **152** may be slidably disposed between one of the baffle panels **140** and the shoulder strap **104**L, providing convenient access to the user.

[**0036**] To use the hydration pack **100**, the user fills the bladder **151** of the bladder assembly **150** with the desired fluid, such as water, and inserts the bladder into the volume defined by the front panel **102**, back panel **112**, and baffle panels **140** with the elongate tube **152** extending through the aperture **142** in one of the baffle panels **140**. The elongate tube **152** extends upwardly, generally along the baffle panel **140**, and over the shoulder strap **104**L where it may be retained in a convenient location for the user. The cover **120** is closed over the bladder **151** and fastened with the buckle assembly **125**. The user then dons the hydration pack **100** by inserting the user's arms through the shoulder straps **104**L, **104**R, fastening the chest strap **111** and split belt assembly **130**, as desired. The lengths of the various straps may be adjusted to accommodate the user's comfort and preferences. It will be appreciated that the bladder **151** will be held close to the user with very little shifting, even during strenuous activities, allowing the user to hydrate as necessary with only limited encumbrance from the hydration pack **100**.

[**0037**] An alternative embodiment of a hydration pack **200** according to the present invention, is shown in **FIG. 7**. The hydration pack **200** includes a front panel **202** adapted to lay next to the user's back and a back panel **212** attached to and generally overlying the front panel **202**, the front and back panels at least partially defining a volume for receiving the bladder assembly **150**. The hydration pack **200** is in general similar to the hydration pack **100** described above, and a description of the similar portions will not be repeated here. However, the construction of this embodiment is simpler in that the hydration pack **200** does not utilize a split belt assembly, but rather includes a simpler adjustable waist strap **230**L, **230**R that is attached directly to the back panel **212**.

[**0038**] In particular, the back panel **212** is formed with oppositely disposed tab portions **213** that are attached to the front panel **202** with intermediate straps **215**. The left portion of the waist strap **230**L slidably engages the one intermediate strap **215** and the right portion of the waist strap **230**R slidably engages the other intermediate strap **215** through semirigid buckle loops **217** (one shown). Therefore, when the waist strap **230**L, **230**R is secured and tensioned about the waist of the user, the waist strap **230**L, **230**R will pull on the tab portions **213** and urge the back panel **212** toward the front panel **202**, thereby holding the bladder

assembly in desirably close proximity to the user. This alternative embodiment is somewhat simpler in construction than the hydration pack **100** described above and may be less restrictive to the user for some applications.

[**0039**] While the preferred embodiment of the invention has been illustrated and described, it will be appreciated that various changes can be made therein without departing from the spirit and scope of the invention.

1. A hydration pack comprising:

a flexible bladder assembly including a bladder, an elongate tube having a proximal end in fluid communication with the bladder and a distal end, and a valve disposed at the distal end of the elongate tube;

a backpack having a front panel adapted to lay adjacent the user's back, a back panel attached to the front panel, first and second side panels attached to the front panel and the back panel, the front panel, back panel, and first and second side panels defining a volume for receiving the bladder;

a left shoulder strap and a right shoulder strap, the shoulder straps attached to the front panel of the backpack; and

a split belt having a first strap attached to the front panel of the backpack and a second strap that extends over the back panel of the backpack, the split belt adapted to be releasably fastened about the waist of the user.

2. The hydration pack of claim 1, wherein the first strap of the split belt is an integral portion of the front panel.

3. The hydration pack of claim 1, wherein at least a portion of the split belt second strap is elastic.

4. The hydration pack of claim 3, wherein the back panel of the backpack further comprises a keeper and wherein the elastic portion of the second strap is slidably retained by the keeper.

5. The hydration pack of claim 1, wherein volume for receiving the bladder is open at the top and wherein the hydration pack further comprises a cover panel that is fixedly attached to a top edge of the front panel and is releasably attachable to the back panel of the backpack to substantially cover the open top of the volume.

6. The hydration pack of claim 1, wherein the back panel of the backpack further comprises left and right elongate strap portions that are adapted to extend generally along the left and right shoulder straps.

7. The hydration pack of claim 6, wherein the left and right shoulder straps further comprise a plurality of keepers and wherein the left and right elongate strap portions of the front panel are slidably retained by the plurality of keepers.

8. The hydration pack of claim 1, further comprising a releasable chest strap having a first portion attached to the left shoulder strap and a second portion attached to the right shoulder strap.

9. The hydration pack of claim 1, wherein the second strap of the split belt is adapted to apply a pressure to the bladder when the split belt is fastened about the waist of the user.

10. The hydration pack of claim 9, wherein the split belt holds the bladder adjacent to the user's back when the split belt is fastened about the waist of the user.

11. A hydration pack comprising:

a nonrigid backpack defining a volume, the backpack having a left shoulder strap, a right shoulder strap, and a bottom portion;

a split belt assembly attached to the bottom portion of the backpack, the split belt assembly having a lower belt portion disposed below the backpack and an upper belt portion that extends behind the backpack over the defined volume, the split belt assembly further having a buckle assembly adapted to releasably fastened split belt assembly about the user; and

a pliable bladder removably insertable into the defined volume such that the upper belt portion overlies the pliable bladder, the pliable bladder further including a tube having a proximal end in fluid communication with a lower portion of the pliable bladder and a distal end, wherein the tube is adapted to extend over the top of the backpack.

12. The hydration pack of claim 11, wherein the backpack comprises a breathable front panel, a pliable back panel, and at least two side panels that connect the front panel and the back panel.

13. The hydration pack of claim 11, wherein at least some of the upper belt portion of the split belt assembly is elastic.

14. The hydration pack of claim 11, wherein the backpack further comprises a keeper disposed on a back portion of the backpack and wherein the upper belt portion of the split belt assembly is slidably retained by the keeper.

15. The hydration pack of claim 12, wherein the left and right shoulder straps each further comprises at least one keeper, and further, wherein the pliable back panel of the backpack further comprises left and right elongate strap portions that are slidably retained by the left and right shoulder strap keepers.

16. The hydration pack of claim 11, further comprising a chest strap having a first portion that is attached to the left shoulder strap, a second portion that is attached to the right shoulder strap, and a buckle assembly for releasably connecting the first and second portions.

17. The hydration pack of claim 11, wherein the split belt assembly is adapted to apply a pressure to the bladder.

* * * * *