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(54) **ULTRALIGHT HYDRATION PACK**

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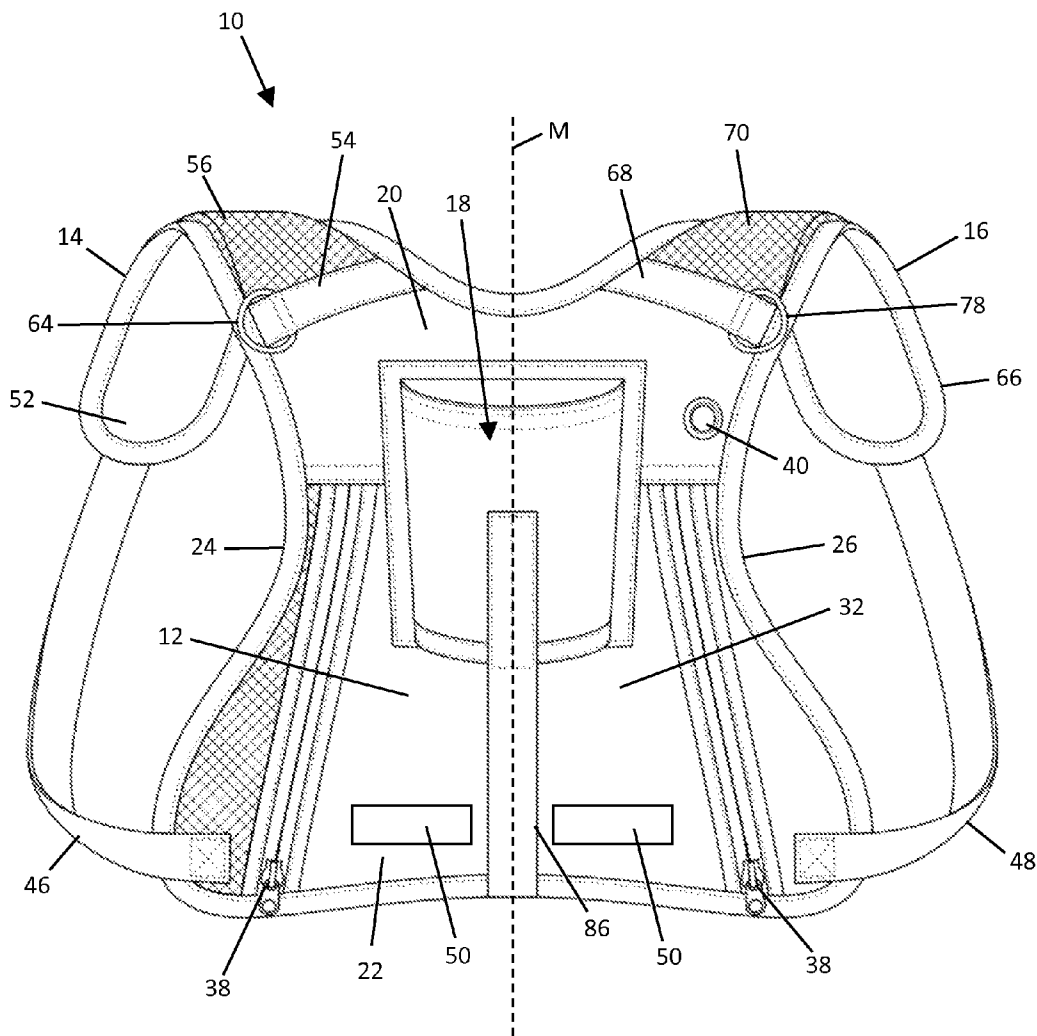
(57) **ABSTRACT**

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**Related U.S. Application Data**

(60) Provisional application No. 61/701,821, filed on Sep. 17, 2012.

This application describes a hydration pack suitable for use while engaging in a prolonged physical activity such as running. The hydration pack is configured to sit on the upper back of a user and includes an adjustable-height hydration vessel receptacle.



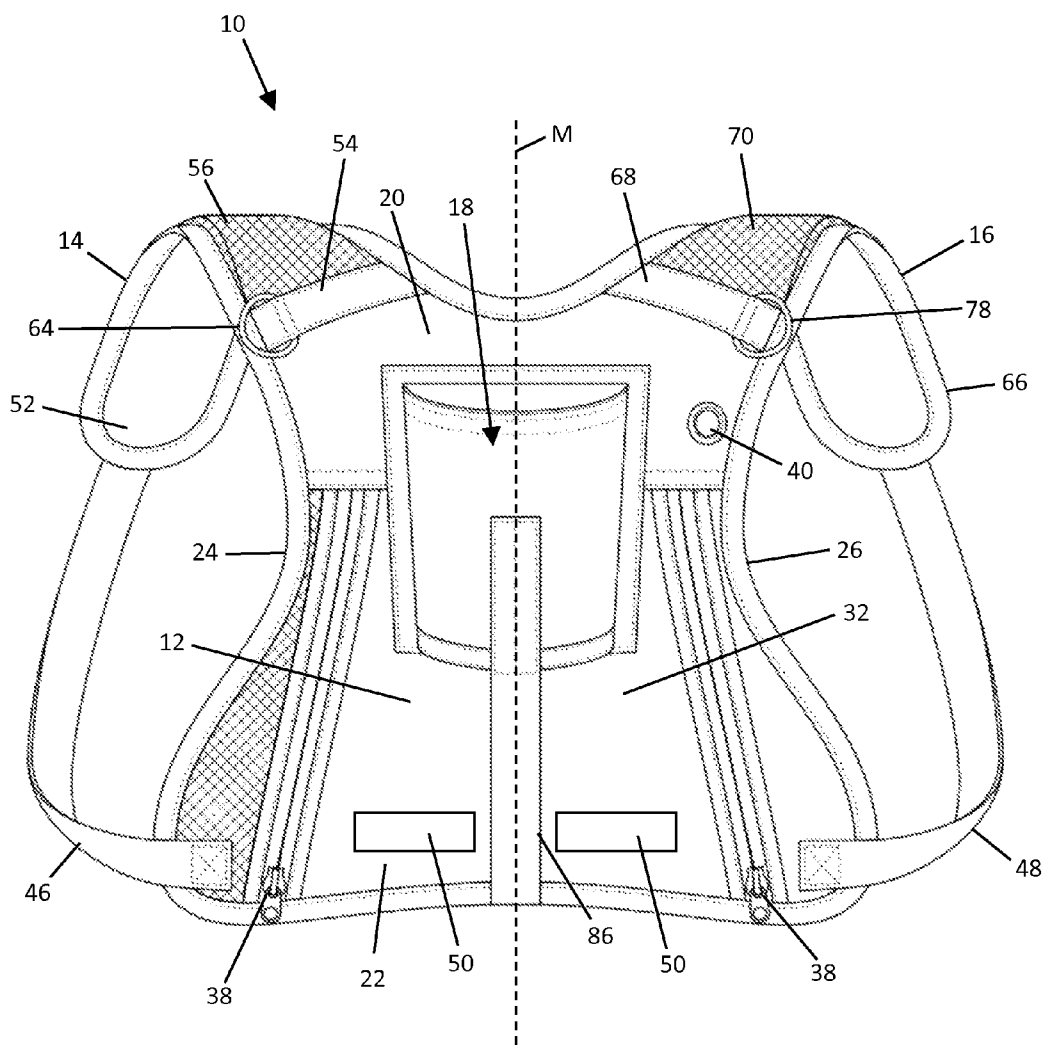


Fig. 1

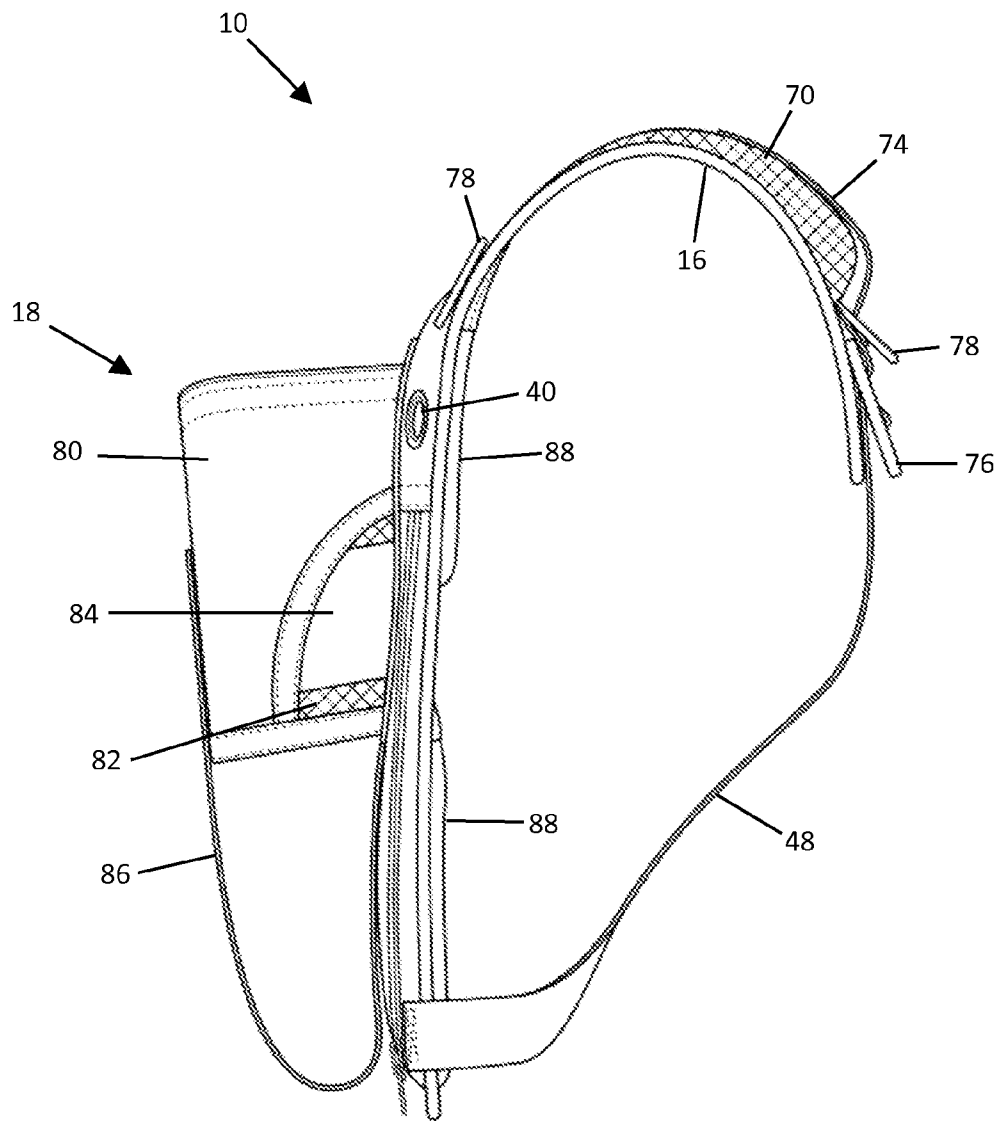
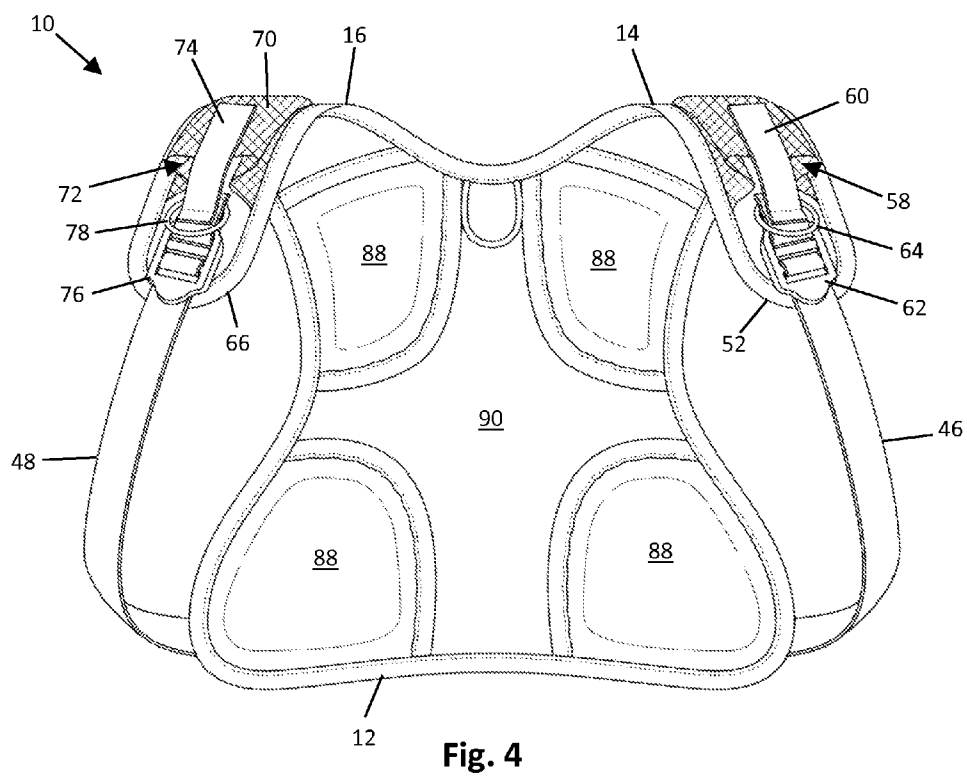
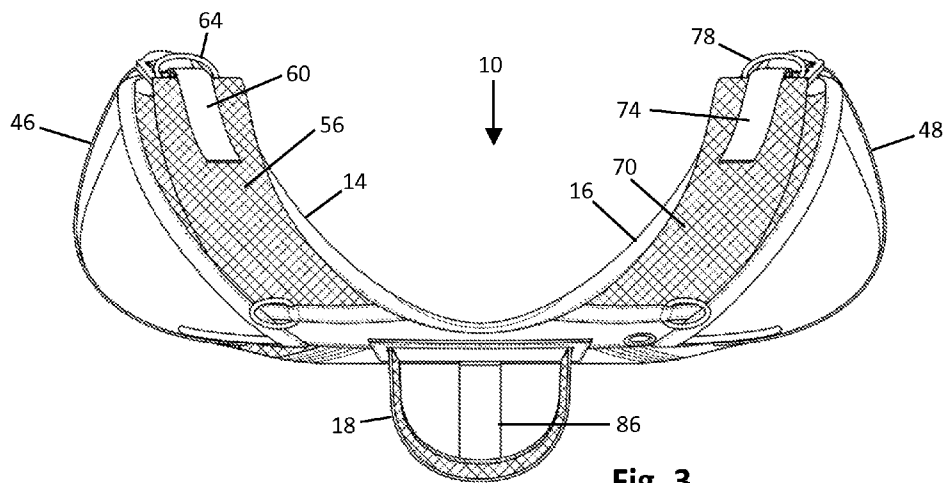


Fig. 2



**ULTRALIGHT HYDRATION PACK**

**SUMMARY OF THE INVENTION**

**CROSS REFERENCES TO RELATED APPLICATIONS**

[0001] The present application is a non-provisional application claiming the benefit of priority under 35 U.S.C. §119 (e) from commonly owned and co-pending U.S. Provisional Application Ser. No. 61/701,821 filed on Sep. 17, 2012 and entitled “Hydration Pack,” the entire contents of which are hereby incorporated by reference into this disclosure as if set forth fully herein.

**FIELD**

[0002] This application relates to a backpack and in particular a hydration pack suitable to be worn on the upper back of a user.

**BACKGROUND**

[0003] It is commonly known that people who engage in prolonged exercise activity need to keep themselves hydrated with water or other suitable hydration beverages. Certain activities, such as running, hiking, and biking, require participants to bring their own hydration supply with them. This can be a challenge as hydration supplies and the equipment necessary to transport it can be heavy, bulky, and uncomfortable for the user. This is especially true for runners, as they have to wear the hydration supply at all times while engaging in an activity that causes substantial movement of any packs they may be wearing.

[0004] Previous hydration packs for runners have been typically designed so that the hydration supply rests on the hips or lower back of the user, with the rationale being that the additional weight is best borne in such a position. This configuration has drawbacks, however, in that substantial jostling of the pack and hydration supply occurs due to the movement associated with running. This can cause discomfort for the user in terms of chafing and uneven weight distribution. Furthermore, heat buildup can be a problem with hydration supplies that are positioned at the waist or lower back.

[0005] Traditionally, hydration supply vessels come in two main forms: bottles and pouches. Bottles are easy to fill, can be removed by hand, and are easy to clean. On the other hand, they are also bulky and rigid, which can be uncomfortable when worn. Pouches have the advantage of being soft and pliable, but are difficult to clean and must be used with a hydration tube. In either case, however, bottles and pouches worn at the hip or lower back will experience substantial jostling while the user is running. Even contents in a traditional backpack will experience significant side-to-side sway during use.

[0006] Another drawback with the traditional bottle-based packs is that the bottles are typically difficult to remove from and replace into the bottle holders. Because of the placement on the body and the aforementioned jostling of the bottles, the tension required to keep the bottle stable within the bottle holders during use is significant. This makes it more difficult for the user to access the bottle while running, and especially challenging to replace the bottle while running. However, less tension might allow the bottles to fall out of the holders while the runner is running.

[0007] The hydration pack described herein is directed towards overcoming the shortcomings of the prior art.

[0008] The hydration pack described herein addresses the disadvantages of the prior art backpacks by providing a pack that is designed to mount a hydration supply vessel high on the back of a user to reduce movement of the vessel due to normal body movement during the act of running. Positioning the pack high on the shoulders keeps the movement of the fluid in the vessel at a minimum, and a snug fit of the vessel holder as well as the vessel support designed into the vessel holder prevents the vessel from moving within the holder. Compared to a traditional waist mounted running pack, the hydration pack described herein experiences less heat buildup, less movement, and completely eliminates waist constriction, which can be uncomfortable while running. Compared to a standard backpack, the hydration pack described herein does not experience side-to-side sloshing.

[0009] By way of example only, the hydration pack described herein is provided as a single-bottle configuration. Other configurations are possible, (including but not limited to) multi-bottle configurations and bladder configurations (both single and multiple). The hydration pack includes a pack body, a pair of shoulder extensions extending away from the pack body, and a hydration vessel retention system positioned on the pack body. The shoulder extensions are positioned along the top portion of the pack body and extend away from the pack body at an angle relative to the vertical midline of the pack body. By way of example only, the angles of each shoulder extension are substantially similar but oriented on opposite sides of the midline such that at least in shape the shoulder extensions are mirror images of one another.

[0010] The pack body is configured to rest on a user’s upper back during use, for example between the shoulder blades. Consequently it is desirable to minimize discomfort to the user by providing a pack body that is contoured so as to reduce interaction with moving joints (e.g. the shoulder blades that move as one runs), thereby making the pack body more stable and secure. To achieve this goal, the bottom portion of the pack body is generally wider than the top portion, and the sides have a generally curved outer perimeter that continues along the shoulder extensions. Thus, when viewed as a whole with the shoulder straps, the hydration pack has a generally X-shaped overall geometric configuration.

[0011] The pack body has one or more secure storage areas configured to hold personal items. By way of example, the hydration pack described herein includes a single secure storage area. The secure storage area may be provided in any size and shape suitable to securely hold one or more of the user’s larger personal items, for example including but not limited to one or more keys, wallet, money pouch, identification, music player, and the like. By way of example only, the secure storage area described herein includes a zippered pocket formed out of solid material that is accessed from the side. A second zipper may be included to provide zippered access from either side of the pocket. A small opening is provided near the top of the pocket to allow passage of a wire, for example for headphones. The secure storage area may also include a key clip to attach one or more keys. Two adjustment straps are attached to the bottom portion of the pack body and connect to the shoulder extensions. The adjustment straps are adjustable in length to accommodate a wide variety of users and to provide optimal comfort. One or more reflectors may be provided on the pack body to improve the visibility of users to automobiles at night.

**[0012]** The shoulder extensions are sized and configured to extend over each of the user's shoulders to help snugly secure the hydration pack to the user. Each shoulder extension has an elongated storage receptacle positioned on the outer surface so as to be accessible by the user while the hydration pack is in use. The storage receptacles are formed of mesh fabric and are sized and configured to hold one or more energy snacks, for example nutritional supplements, gels, candies, and the like that a user may choose to employ while exercising. The storage receptacles are oriented such that the openings are positioned near the distal ends of the shoulder extensions, to enhance accessibility for the user. The storage receptacles each include a security feature to keep the energy snacks from falling out during use. Unlike the secure storage area which needs to remain closed while the hydration pack is in use, the security features of the shoulder storage receptacles must be easily manipulated by the user while exercising. By way of example, the security feature comprises a hook and loop fastener, however other easy-access security features are possible (e.g. snap, button, etc.). The shoulder extensions each further include a strap adjuster positioned at the distal end of each shoulder extension. The strap adjusters are configured to adjustably receive the adjustment straps to allow the user to ensure a proper fit of the hydration pack. Optionally, the shoulder extensions may each include one or more rings attached to the outer surface that may be employed to serve several purposes, including but not limited to providing guidance for a hydration hose and/or providing attachment points for miscellaneous gear.

**[0013]** The hydration vessel retention system is configured to securely hold a hydration vessel while allowing for easy insertion and removal of the hydration vessel during use. The hydration vessel may be any type of container capable of securely holding liquid, including but not limited to a bottle or pouch. For the purpose of illustration, the hydration pack described herein is configured to receive a bottle-type hydration vessel. The hydration vessel retention system is positioned along the midline of the pack body. This ensures that the hydration vessel will be positioned in the center of the user's upper back during use. Such a positioning has several advantages over traditional waist packs and standard-style backpacks, including minimal heat transfer from the user, less movement of the hydration vessel during use, and therefore less movement of the liquid in the hydration vessel during use.

**[0014]** The hydration vessel retention system includes a generally funnel-shaped opening that improves the efficiency at which the user is able to insert and remove the hydration vessel. By way of example only, the hydration vessel retention system includes a tension band positioned between inner and outer sleeves. The tension band creates an opening with a diameter that is smaller than the top opening created by the outer and inner sleeves. The result is a funnel-shaped opening that is not under tension but that will guide the vessel into the tension band. The tension band itself may exert less tension than exhibited in waist packs because the vessel will experience far less jostling when positioned on the upper back of a user. The end result is a hydration vessel retention system that allows for easy, one-handed insertion and removal of a hydration vessel while the user is running.

**[0015]** The hydration vessel retention system includes a height adjustment mechanism including a strap extending below the outer and inner sleeves and configured to receive and hold a hydration vessel. The height adjustment mecha-

nism may be manipulated by a user to accommodate different sized hydration vessels. The height adjustment mechanism may attach to the pack body by way of any mechanism suitable for easy adjustment by a user, for example including but not limited to hook and loop fasteners, snaps, buttons, and the like.

**[0016]** The hydration pack **10** example shown and described herein has a single hydration vessel retention system **18**, however multiple such systems are possible without departing from the scope of the disclosure. For example, The hydration pack **10** may be provided with a pair of hydration vessel retention systems **18** situated in a side-by-side orientation. Still other configurations are possible.

**[0017]** The hydration pack includes a plurality of pads on the back/inside surface of the pack. The pads are extra thick to provide for a snug, comfortable fit on the user. The pads are arranged in a quadrant configuration with a space in between them. The space functions as an air passage to improve "breathability" and comfort for the user.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0018]** Many advantages of the present invention will be apparent to those skilled in the art with a reading of this specification in conjunction with the attached drawings, wherein like reference numerals are applied to like elements and wherein:

**[0019]** FIG. 1 is a front view of a hydration pack according to one example embodiment;

**[0020]** FIG. 2 is a side view of the hydration pack of FIG. 1;

**[0021]** FIG. 3 is a top view of the hydration pack of FIG. 1; and

**[0022]** FIG. 4 is a rear view of the hydration pack of FIG. 1.

#### DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

**[0023]** Illustrative embodiments of the invention are described below. In the interest of clarity, not all features of an actual implementation are described in this specification. It will of course be appreciated that in the development of any such actual embodiment, numerous implementation-specific decisions must be made to achieve the developers' specific goals, such as compliance with system-related and business-related constraints, which will vary from one implementation to another. Moreover, it will be appreciated that such a development effort might be complex and time-consuming, but would nevertheless be a routine undertaking for those of ordinary skill in the art having the benefit of this disclosure. The hydration pack disclosed herein boasts a variety of inventive features and components that warrant patent protection, both individually and in combination.

**[0024]** FIGS. 1-4 of the present application illustrate one example of a hydration pack **10** suitable for wearing on a user's back while engaging in vigorous activity, such as running. By way of example, the hydration pack **10** described herein is provided as a single-bottle configuration. Other configurations are possible within the scope of this disclosure, (including but not limited to) multi-bottle configurations and bladder configurations (both single and multiple). Referring to FIG. 1, the hydration pack **10** includes a pack body **12**, first and second extensions **14**, **16** extending away from the pack body **12**, and a hydration vessel retention system **18** positioned on the pack body **12**. The pack body **12** includes a top portion **20**, a bottom portion **22**, and first and second sides **24**,

26, respectively. The first extension 14 is positioned on the first side 24 of the top portion 20 and extends away from the top portion 20 at an angle  $\theta_1$  relative to the vertical midline M of the pack body 12. The second extension 16 is positioned on the second side 26 of the top portion 20 and extends away from the top portion 20 at an angle  $\theta_2$  relative to the vertical midline M of the pack body 12. By way of example only, the angles  $\theta_1$  and  $\theta_2$  are substantially identical but oriented on opposite sides of the midline M such that at least in shape the first and second extensions 14, 16 are mirror images of one another.

[0025] The pack body 12 is configured to rest on a user's upper back during use, for example between the shoulder blades. Consequently it is desirable to minimize discomfort to the user by providing a pack body 12 that is contoured so as to reduce interaction with moving joints (e.g. the shoulder blades that move as one runs), thereby making the pack body 12 more stable and secure. To achieve this goal, the bottom portion 22 of the pack body 12 is generally wider than the top portion 20, and first and second sides 24, 26 have a generally curved outer perimeter that extends along the first and second extensions 14, 16.

[0026] The pack body 12 is provided with one or more secure storage areas configured to hold personal items. By way of example, the hydration pack 10 described herein includes a single secure storage area, however multiple secure storage areas are possible. The secure storage area 32 may be provided in any size and shape suitable to securely hold one or more of the user's larger personal items, for example including but not limited to one or more keys, wallet, money pouch, identification, music player, and the like. By way of example only, the secure storage area 32 described herein includes a receptacle and a security feature 38. The receptacle comprises a pocket formed out of solid material that is accessed from the side. The security feature 38 may include any device or mechanism that ensures the personal items in the receptacle will not fall out of the secure storage area 32. For example, the security feature 38 shown in FIG. 1 comprises a zipper. Other security features are possible, however, including (but not limited to) buttons, snaps, and hook and loop fastener (e.g. Velcro). As shown by way of example, the secure storage area 32 may be provided with a second security feature 38 to allow for secure access from either side of the storage area 32. This is advantageous to allow equal access for any user regardless of their dominant handedness. A small opening 40 is provided near the top of the receptacle to allow passage of a headphones wire. First and second straps 46, 48 are attached to the bottom portion 22 of the pack body 12, and connect to the first and second extensions 14, 16. The straps 46, 48 function to secure the hydration pack 10 to the user. The straps 46, 48 are adjustable in length to accommodate a wide variety of users and to provide optimal comfort. Optionally, one or more reflectors 50 may be provided to improve the visibility of users to automobiles at night.

[0027] The first extension 14 is sized and configured to extend over the user's left shoulder to help snugly secure the hydration pack 10 to the user. The first extension 14 has a distal end 52, a proximal end 54, and includes an elongated storage receptacle 56 positioned on the outer surface of the first extension 14 so as to be accessible by the user while the hydration pack 10 is in use. The storage receptacle 56 is formed of mesh fabric and is sized and configured to hold one or more energy snacks, for example nutritional supplements, gels, candies, and the like that a user may choose to employ

while exercising. The storage receptacle 56 is oriented such that the opening 58 is positioned near the distal end 52 of the first extension 14, to enhance accessibility for the user. The storage receptacle 56 includes a security feature 60 to keep the energy snacks from falling out during use. Unlike the security feature 38 of the secure storage area 32 that needs to remain closed while the hydration pack 10 is in use, the security feature 60 of the storage receptacle 56 must be easily manipulated by the user while exercising. By way of example only, the security feature 60 comprises a strap having a hook and loop fastener, however other easy-access security features are possible (e.g. snap, button, etc.). The first extension 14 further includes a strap adjuster 62 positioned at the distal end 52. The strap adjuster 62 is configured to adjustably receive the strap 46 to allow the user to ensure a proper fit of the hydration pack 10. Optionally, the first extension 14 may include one or more rings 64 attached to the outer surface of the extension 14. Rings 64 may be employed to serve several purposes, including but not limited to providing guidance for a hydration hose (not shown) and/or providing attachment points for miscellaneous gear. The rings 64 may be made of rigid materials (e.g. metal) or non-rigid materials (e.g. plastic).

[0028] The second extension 16 is sized and configured to extend over the user's right shoulder to help snugly secure the hydration pack 10 to the user. The second extension 16 has a distal end 66, a proximal end 68, and includes an elongated storage receptacle 70 positioned on the outer surface of the second extension 16 so as to be accessible by the user while the hydration pack 10 is in use. The storage receptacle 70 is formed of mesh fabric and is sized and configured to hold one or more energy snacks, for example nutritional supplements, gels, candies, and the like that a user may choose to employ while exercising. The storage receptacle 70 is oriented such that the opening 72 is positioned near the distal end 66 of the second extension 16, to enhance accessibility for the user. The storage receptacle 70 includes a security feature 74 to keep the energy snacks from falling out during use. Unlike the security feature 38 of the secure storage area 32 that needs to remain closed while the hydration pack 10 is in use, the security feature 74 of the storage receptacle 70 must be easily manipulated by the user while exercising. By way of example only, the security feature 74 comprises a strap including a hook and loop fastener, however other easy-access security features are possible (e.g. snap, button, etc.). The second extension 16 further includes a strap adjuster 76 positioned at the distal end 66. The strap adjuster 76 is configured to adjustably receive the strap 48 to allow the user to ensure a proper fit of the hydration pack 10. Optionally, the second extension 16 may include one or more rings 78 attached to the outer surface of the extension 16. Rings 78 may be employed to serve several purposes, including but not limited to providing guidance for a hydration hose (not shown) and/or providing attachment points for miscellaneous gear. The rings 78 may be made of rigid materials (e.g. metal) or non-rigid materials (e.g. plastic).

[0029] The hydration vessel retention system 18 is configured to securely hold a hydration vessel while allowing for easy insertion and removal of the hydration vessel during use. By way of example only, the hydration vessel may be any type of container capable of securely holding liquid, including but not limited to a bottle or pouch. For the purpose of illustration, the hydration pack 10 described herein is configured to receive a bottle-type hydration vessel. The hydration vessel

retention system **18** is positioned along the midline M of the pack body **12**. This ensures that the hydration vessel will be positioned in the center of the user's upper back during use. Such a positioning has several advantages over traditional waist packs and standard-style backpacks, including minimal heat transfer from the user, less movement of the hydration vessel during use, and therefore less movement of the liquid in the hydration vessel during use. In a 2-vessel configuration (not shown), a pair of hydration vessel retention systems **18** would be situated side-by-side in the center of the user's upper back.

**[0030]** The hydration vessel retention system **18** described herein is configured to receive a bottle-type hydration vessel. As best shown in FIG. 2, the hydration vessel retention system **18** is attached to the pack body **12** forming a receptacle, and includes an outer sleeve **80**, an inner sleeve **82**, a semi-rigid insert (not shown), a tension band **84**, and a height adjustment mechanism **86**. The inner sleeve **82** is provided (by way of example only) as a mesh sleeve while the outer sleeve **80** is of solid fabric construction. The semi-rigid insert is positioned between the outer sleeve **80** and inner sleeve **82** and is configured to give the hydration vessel retention system **18** its shape. By way of example, the semi-rigid insert is composed of polyethylene terephthalate (PET), however other materials are possible. The semi-rigid insert is generally cylindrical in shape but has an upper portion that tapers radially outward to give a slight funnel shape to the upper portion of the hydration vessel retention system **18**. The tension band **84** is positioned between the inner sleeve **82** and semi-rigid insert and is pre-tensioned to be able to snugly receive the hydration vessel therein. The tension band is made from a stretch web material that is more durable, longer lasting, and more rigid than elastic. The tension band **84** is vertically offset from the top of the inner sleeve **82** at an advantageous pinch point, and the diameter of the receptacle defined by the tension band **84** is less than the diameter of the receptacle defined by the top portion of the semi-rigid insert. Thus, the upper portion of the hydration vessel retention system **18** is tapered such that it forms a funnel shape. This funnel shape improves the efficiency at which the user is able to insert and remove the hydration vessel. The height adjustment mechanism **86** includes a strap extending below the outer and inner sleeves **80**, **82** and is configured to receive and hold a hydration vessel. The height adjustment mechanism may **86** be adjusted by a user to accommodate differently sized hydration vessels. The height adjustment mechanism **86** may attach to the pack body **12** by way of any mechanism suitable for easy adjustment by a user, for example including but not limited to hook and loop fasteners, snaps, buttons, and the like.

**[0031]** The hydration pack **10** example shown and described herein has a single hydration vessel retention system **18**, however multiple such systems are possible without departing from the scope of the disclosure. For example, the hydration pack **10** may be provided with a pair of hydration vessel retention systems **18** situated in a side-by-side orientation. Still other configurations are possible.

**[0032]** Referring now to FIG. 4, the hydration pack **10** includes a plurality of pads **88** on the inside surface of the pack. The pads **88** are extra thick to provide for a snug, comfortable fit on the user. By way of example, the hydration pack **10** includes four pads **88**, however any number of pads are possible. The pads **88** are arranged in a quadrant configura-

tion with a space **90** in between them. The space **90** functions as an air passage to improve "breathability" and comfort for the user.

**[0033]** The hydration pack **10** shown and described herein by way of example is made of nylon materials. Other durable lightweight fabrics are possible without departing from the scope of the disclosure.

**[0034]** While the inventive features described herein have been described in terms of a preferred embodiment for achieving the objectives, it will be appreciated by those skilled in the art that variations may be accomplished in view of these teachings without deviating from the spirit or scope of the invention.

What is claimed is:

**1.** A pack configured to be worn on a user's back while exercising, comprising:

a pack body including a front face, a back face, a top portion, a bottom portion, a first side, and a second side, the pack body including at least one sealable receptacle positioned on the front face, the pack body further including a first adjustment strap attached to the first side of the bottom portion of the pack body and a second adjustment strap attached to the second side of the bottom portion of the pack body;

first and second shoulder extensions, the first shoulder extension attached to the first side of the top portion of the pack body and extending outwardly away from the pack body at a first angle, the second shoulder extension attached to the second side of the top portion of the pack body and extending outwardly away from the pack body at a second angle, the first and second shoulder extensions configured to extend over each of the user's shoulder and mate with the first and second adjustment straps, respectively, to adjustably secure the pack to the user;

at least one hydration vessel retention system configured to receive and securely retain a hydration vessel, the hydration vessel retention system including an outer sleeve, a semi-rigid insert, and a tension band, the semi-rigid insert having a tapered funnel shape including a first portion having a first diameter and a second portion having a second diameter, the first diameter being greater than the second diameter.

**2.** The pack of claim **1**, wherein the sealable receptacle includes a security feature.

**3.** The pack of claim **2**, wherein the security feature comprises at least one of a zipper, buttons, snaps, and hook and loop fastener.

**4.** The pack of claim **1**, wherein the back face includes at least two pads.

**5.** The pack of claim **4**, wherein the at least two pads are separated by a space.

**6.** The pack of claim **1**, wherein at least one of the first and second shoulder extensions includes a storage receptacle configured to be accessible by the user while wearing the pack.

**7.** The pack of claim **6**, wherein the storage receptacle includes a closure device.

**8.** The pack of claim **7**, wherein the closure device comprises at least one of a snap, button, zipper, and hook and loop fastener.

**9.** The pack of claim **1**, wherein the hydration vessel retention system further includes an adjustment element for adjusting the height of the retention system.

**10.** The pack of claim **9**, wherein the adjustment element comprises a strap releaseably attached to the outer sleeve.



**11.** The pack of claim **10**, wherein the adjustment element is releaseably attached to the outer sleeve by one of a hook and loop fastener, snap, and button.

**12.** The pack of claim **1**, wherein the hydration vessel comprises a bottle.

**13.** A pack configured to be worn on a user's back while exercising, comprising:

a pack body including a front face, a back face, a top portion, a bottom portion, a first side, and a second side, the pack body including at least one sealable receptacle positioned on the front face, the pack body further including a first adjustment strap attached to the first side of the bottom portion of the pack body and a second adjustment strap attached to the second side of the bottom portion of the pack body;

first and second shoulder extensions, the first shoulder extension attached to the first side of the top portion of the pack body and extending outwardly away from the pack body at a first angle, the second shoulder extension attached to the second side of the top portion of the pack body and extending outwardly away from the pack body at a second angle, at least one of the first and second shoulder extensions including a storage receptacle configured to be accessible by the user while wearing the pack, the first and second shoulder extensions configured to extend over each of the user's shoulder and mate with the first and second adjustment straps, respectively, to adjustably secure the pack to the user;

at least one hydration vessel retention system configured to receive and securely retain a hydration vessel.

**14.** The pack of claim **13**, wherein the sealable receptacle is sealable by at least one of a zipper, button, snap, and hook and loop fastener.

**15.** The pack of claim **13**, wherein the storage receptacle includes a closure element to prevent contents from becoming dislodged from the storage receptacle during use.

**16.** The pack of claim **15**, wherein the closure element comprises one of a snap, button, zipper and hook and loop fastener.

**17.** The pack of claim **13**, wherein the storage receptacle is formed of a mesh material enabling the user to visually identify the contents.

**18.** The pack of claim **13**, wherein the hydration vessel retention system includes an outer sleeve, a semi-rigid insert, and a tension band.

**19.** The pack of claim **18**, wherein the semi-rigid insert has a tapered funnel shape including a first portion having a first diameter and a second portion having a second diameter, the first diameter being greater than the second diameter.

**20.** The pack of claim **13**, wherein the hydration vessel retention system includes an adjustment element for adjusting the capacity of the retention system to accommodate variable sizes of hydration vessels.

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