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(71) Applicant: **Gordini U.S.A. Inc.**

Essex Junction, Vermont 05451 (US)

(72) Inventors:

• **Gellis, David**

Montreal, Quebec, H2L 3M7 (CA)

• **Van Roost, Oli**

Montreal, Quebec, H4A 1X2 (CA)

• **Shaanan, Gad**

Westmount, Quebec, H3Y 1P1 (CA)

• **Duval, Francois**

Terrebonne, Quebec, J6W 3E3 (CA)

• **Brousseau, Ivan**

Montreal, Quebec, H1X 2M3 (CA)

(74) Representative: **Chettle, Adrian John et al**

Withers & Rogers,

Goldings House,

2 Hays Lane

London SE1 2HW (GB)

(54) **Advanced backpack system**

(57) An integrated backpack system including an integrated hydrating frame for storing a liquid and providing a substantially rigid support to the backpack. A harness releasably secures the frame to the backpack. A movable pouch connected to the backpack with a shockcord moves from a storage position to an acces-

sible position. A slidable pouch slides along a second belt between a storage position and an accessible position as well. A weight supporting and ventilating system shifts the weight of the backpack and its contents to the user's waist and hips and provides an airway for ventilation between the backpack and the user's back.

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Description

BACKGROUND OF THE INVENTION

[0001] The invention is generally directed to an improved advanced backpack system and in particular to a backpack system which includes an integral bladder system which acts as the frame for the backpack, a pod based weight adjustment and ventilation system, a retractable pocket system for easy access and stowage and a removable harness system for releasably securing the integral bladder frame and weight adjustment and ventilation system to the backpack.

[0002] As skiing and snowboarding have increased in popularity, the equipment which is utilized has been under continuing pressure to increase in quality and functionality to meet the enhanced demands and requirements of both elite and recreational outdoor enthusiasts. As skiers and snowboarders increase their back country, off trail and technical skiing and snowboarding there is a need for improved backpacks which can be worn while skiing or snowboarding which provide for storage of clothing, gloves, goggles, sunglasses, food and hydration systems. Also, there is a need for some of the things in the backpack to be readily accessible without removing the pack from the wearer's shoulders and back. Thus, there is a need for pockets, compartments and a hydration system which can be made accessible while on the wearer's back and preferably without disturbing the weight balance of the backpack on the wearer. For a backpack to support the weight of the pack and its contents most efficiently, the bulk of the weight is preferably supported around the wearer's hips and waist, rather than on the shoulders. Also, where the backpack rests up against the wearer's back this cuts down on the profile of the backpack and wearer, but tends to make the wearer's back warm and sweaty. Particularly when the wearer has adjusted his or her clothing to the prevailing weather, the addition of the backpack against the back will cause a severe buildup of heat and undesirable sweating. Also, in many circumstances there is a desire for a very lightweight pack, where only a few items are required and neither the frame or the hydration system are necessary. For example, if the skier or snowboarder is skiing extreme terrain and wants to keep the weight of the pack to a minimum, it would be desirable to remove the frame and hydration system to minimize the weight and bulkiness of the system. It is also important that the user can then also add these back onto the backpack without inconvenience.

[0003] Accordingly, there is a need for an improved backpack which includes a variety of features which increase the overall utility of the backpack, including: an integrated hydration system which operates as a frame for the backpack; a pod based weight bearing system which adjusts the weight of the backpack and its contents so that the weight is borne by the user at the hips and waist, rather than the shoulders and provides an air

clearance between the backpack and the user's back to provide better homeostatic control of the temperature in a uniform fashion unaffected by the backpack; one or more retractable pockets or compartments which can be accessed easily while the backpack is on the user's back and then returned to a storage position without disrupting the attachment of the backpack or the weight distribution of the backpack; and a releasable harness for securing the integrated hydration system frame and weight distribution and ventilation system to the backpack so that the backpack can be worn either with the hydration system frame and weight distribution and ventilation system or not as indicated by the user's needs.

SUMMARY OF THE INVENTION

[0004] The invention is generally directed to an integrated backpack system, including a backpack with an inner compartment and an exterior surface in which the exterior surface includes at least a first surface for facing the user's back in an operative position. A strap mechanism is secured to the backpack for supporting the backpack on the user's shoulders. An integrated hydrating frame member stores liquid and provides a substantially rigid support to the first surface of the backpack. A harness coupled to the backpack proximate to or on the first surface of the backpack secures the integrating hydrating frame member to the first surface of the backpack. A hydrating system, coupled to the integrated hydrating frame member enables the user to withdraw the liquid stored in the integrated hydrating frame member. The integrated hydrating frame member is further adapted to rest between the first surface of the backpack and the user's back when the backpack is supported on the user's shoulders by the strap mechanism. As a result, an integrated backpack system with a frame provided by an integrated hydrating system is provided.

[0005] The invention is also directed to an integrated backpack system including a backpack with an inner compartment and an exterior surface including at least a first surface for facing the user's back in an operative position. A strap mechanism, secured to the backpack, supports the backpack on the user's shoulders and proximate the user's back. A weight distribution system, secured to or proximate the first surface of the backpack near to the user's waist or hips contacts the user's back and distributes and shifts much of the weight of the backpack and its included articles from the shoulder region to the hip and waist area through the weight distribution system.

[0006] The invention is also generally directed to an integrated backpack system including a backpack having an inner compartment and an exterior surface including at least a first surface for facing the user's back in an operative position. A strap mechanism, secured to the backpack, supports the backpack on the user's shoulders. A retractable compartment is movably coupled to the backpack and has a first storage position and

a second, accessible position. A biasing mechanism couples the compartment to the backpack and allows the compartment to move relative to the backpack from the storage position to the accessible position and back to the storage position without disengaging the backpack from the user's back.

[0007] The invention is also generally directed to an integrated backpack system in which the backpack includes an inner compartment and an exterior surface including at least a first surface for facing the user's back in an operative position. A strap mechanism is secured to the backpack for supporting the backpack on the user's shoulders and maintaining the first surface of the backpack facing the user's back. An integrated hydrating frame member stores liquid and provides a substantially rigid support to the first surface of the backpack. A weight distribution system, coupled to the integrated hydrating frame member, adjusts most of the weight in the backpack to the wearer's hips or waist from the shoulders. A harness mechanism, coupled to the backpack proximate to or on the first surface of the backpack releasably secures the integrated hydrating frame member and weight distribution system to the first surface of the backpack. The backpack can be worn either with the integrated hydrating frame member secured by the harness mechanism or with the integrated hydrating frame member removed to reduce the weight and bulkiness of the backpack.

[0008] Accordingly, it is an object of the invention to provide an improved integrated backpack system.

[0009] Another object of the invention is to provide an improved integrated backpack system which provides for an integrated hydrating frame releasably secured to the surface of the backpack which faces the wearer's back, a weight balancing system utilizing a pod extending outwardly from the lower portion of the back surface of the backpack to shift the weight of the backpack onto the hips or waist of the wearer and a retractable compartment movably coupled to the backpack, movable between a storage position and an accessible position without removing the backpack from the wearer's back.

[0010] Still another object of the invention is to provide an improved integrated backpack system in which a hydrating system is integrated into a hollow frame for the backpack and the user can obtain a drink from the hydrating system while the backpack is in place on the wearer's back.

[0011] Still a further object of the invention is to provide an improved integrated backpack in which two compartments are movably coupled to the backpack such that they are generally in a storage position which does not interfere with the user's range of motion and are selectively movable to an accessible position either independently or together and may also be fixed in the accessible position which allows easy access to the compartments and items contained therein while the backpack remains on the user's back.

[0012] Yet still a further object of the invention is to

provide an improved integrated backpack in which the backpack includes movable compartments which are biased to remain in a storage position but which may be moved along a designated pathway to an accessible position or positions and may be fixed in the accessible position or positions alone or in pairs.

[0013] Yet still an other object of the invention is to provide an improved integrated backpack system which provides a weight shifting mechanism including an integrated pod system which spaces the lower portion of the backpack away from the wearer's back and wherein the pod rests on the wearer's back proximate the wearer's waist or hips and a strap extending around the wearer's torso proximate the waist which shifts the balancing of the weight on the wearer's body primarily to the hips and waist area, rather than the shoulder and upper back.

[0014] Yet another object of the invention is to provide an improved integrated backpack system in which an integrated hydrating frame is secured to either the exterior or interior of the backpack and interacts with a weight distribution system to provide separation between the backpack and the user's back so that airflow and heat exchange may be improved for the backpack.

[0015] Still yet a further object of the invention is to provide an improved integrated backpack system including an integrated hydrating frame member wherein the integrated hydrating frame member includes an integrated handle portion at the top to act as a handle for the backpack when it is not on the wearer's back.

[0016] Yet still another object of the invention is to provide an improved integrated backpack system in which one or more compartments are integrated into the lower portion of the backpack which are movable from a recessed position which provides an integrated profile to a slidable position proximate the front of the wearer.

[0017] Still other objects and advantages of the invention will, in part, be obvious and will, in part, be apparent from the specification.

[0018] The invention accordingly comprises the features of construction, combinations of elements and arrangements of parts which will be exemplified in the construction as hereinafter set forth, and the scope of the invention will be indicated in the Claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] For a fuller understanding of the invention, reference is had to the following descriptions taken in connection with the accompanying drawings, in which:

Fig. 1 is a perspective view of the integrated hydration frame and back support pod constructed in accordance with a preferred embodiment of the invention;

Fig. 2 is a perspective view of the integrated backpack system constructed in accordance with a preferred embodiment of the invention;

Fig. 3 is a cross-sectional view of the integrated hy-

drating frame member of Fig. 1, taken along line 3-3 of Fig. 1;

Fig. 4 is a perspective view of the integrated backpack in accordance with the invention on a user's body;

Fig. 5 is a perspective view similar to the perspective view of Fig. 4 in which movable pouches are shown being moved from their storage positions of Fig. 4 to accessible positions;

Fig. 6 is a perspective view of the integrated backpack system of Figs. 4 and 5 from the front of the user;

Fig. 7 is a perspective view of the waist strap and cargo pouches for the backpack system of Figs. 4-6 constructed in accordance with a preferred embodiment of the invention;

Fig. 8 is a perspective view of a fanny pack constructed in accordance with a preferred embodiment of the invention;

Fig. 9 is a perspective view of an integrated backpack in accordance with another preferred embodiment of the invention in which two movable pouches are integrated in to the bottom of the backpack; and

Fig. 10 is a perspective view of the integrated backpack of Fig. 9 in which the movable pouches are in the extended positions.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0020] Reference is made to Figures 1-7 wherein an advanced Backpack system, generally indicated as 100, constructed in accordance with a preferred embodiment of the invention, is depicted. The advanced backpack system 100 generally includes a backpack 101 which includes shoulder straps 271 and 272 as seen in Figs. 2, 3 and 4. Backpack 101 includes a series of pockets 104, 105, in a conventional fashion. The particular layout of the pockets may be varied depending upon the particular application of the backpack system 100. Generally, the backpack includes a main inner cavity 107 and a series of smaller pockets or compartments 104, 105, on the back and side of backpack 101. In addition, there may be specialized compartments such as web pockets for holding bottles or similar on the exterior of the backpack 101 and attachment devices on the inside such as key rings or zippered compartments for holding valuables. These elements of the backpack are conventional. In addition, backpack 101, in accordance with the invention, includes a pad member 102 on the surface of the backpack intended to face the wearer's back in use. This surface of the backpack, intended to face the wearer's back will be called variously in this application as either the first surface of the backpack or the back surface of the backpack.

[0021] In addition to the backpack 101 there is an integrated hydrating frame, generally indicated as 150,

constructed in accordance with the invention seen most clearly by itself apart from backpack 101 in Fig. 1. Integrated hydrating frame 150 is a generally oval shaped ring as best seen in Fig. 1. Integrated hydrating frame 150 is secured to backpack 101 and forms a rigid frame on the exterior of backpack 101. Pad 102 on backpack 101 fits inside the ring of frame 150, which helps to seat the frame and provide a generally smooth surface against the wearer's back.

[0022] In a preferred embodiment the integrated hydrating frame 150 is a hollow member as seen best in Fig. 3. Fig. 3 shows the cross-sectional area of frame 150. Preferably, it is filled with liquid, generally water, which can then be consumed by the user by sucking on straw 161 which enters hydrating frame 150 through cap member 160 which provides and opening into the interior hollow chamber 149 of integrated hydrating frame 150. A bit valve is generally used at the end of straw 161. There are numerous bit valves on the market which allow a user to draw liquid through the straw 161 from reservoir 149. These bit valves are designed to be inserted in a user's mouth and squeezed or bitten so that an opening appears and a free passageway to straw 161 and reservoir 149 is established. Any of the currently available bit valves or others may be used in connection with the system. The bit valves prevent the water or other liquid from inadvertently escaping and leaking when the user is not trying to drink. Cap 160 is removable and liquids may be poured in through this opening. However, in a preferred embodiment there is also a larger opening 147 with a cap 148, preferably at the bottom portion of frame 150 in area 158 of frame 150. Again, as shown in Fig. 3, this opening is large enough so that, in addition to liquid being placed in the hydrating frame 150, ice cubes or some other cold or hot pack may be introduced into chamber 149. In a current preferred embodiment of the invention, the integrating frame member is formed out of a rigid plastic which is blow molded so as to provide a thin walled rigid member with the vast majority of the volume of the frame forming the chamber 149 on the interior. Various suitable plastics may be used. The material must be suitable for contact with liquids for human consumption as approved by the Food and Drug Administration or other federal or state regulating agency. In a preferred embodiment the frame 150 is formed from a flexible resin such as Polyurethane. In addition, insulating layers may be added either to the interior or exterior of the frame 150. Soft, spongy insulation may be particularly appropriate on the exterior as this will cushion the frame 150 against the wearer's back. The frame 150 may also be designed for placement inside backpack 101. In this case it would need to be smaller and is preferably located in a special pouch or section or held in place by straps. Alternatively, the dimension and shape can be set so that it fits snugly in a desired position of the backpack 101.

[0023] The shape of frame 150 is set up in a fashion which provides for narrowed regions suitable for receiv-

ing harness straps 201, 202, 203, 204 and 205, which hold the integrated hydrating frame 150 to backpack 101. Thus, there are reduced circumference areas 153, 154, 155 and 156, generally spaced around the perimeter of integrated hydrating frame 150 and a reduced circumference section 159 in the handle area 157. In addition to the reduced circumference areas there are side sections 151 and 152, face section 158 and handle section 157, having handle opening 159. A weight distribution and ventilation enabling system 180 is secured to integrated hydrating frame 150 at lower section 158. The weight distributing and ventilating system includes, in a current preferred embodiment, a projecting pad member 181 which has projecting arm 184 firmly secured to section 158 of integrated hydrating frame 150. Pad 181 includes a contact surface 183 which, in a preferred embodiment, is a rubbery or otherwise padded section which rests up against the wearer's back when the backpack 100 is worn on the user's shoulders. Weight bearing and ventilating element 180 has a dual effect of shifting the force of the weight of the backpack 100 and its contents from the shoulders, due to shoulder straps 271, 272, to the wearer's hip or waist region.

[0024] Contact surface 183 of pad 181 rests above the wearer's buttocks in the center of the back and is generally held in place by a waist harness assembly which includes hip pads 231, 232 and straps 233 and 234, which meet in a clasp 235, closed around the front of the wearer's torso. Usually, the hip pads 231, 232 are adapted to rest on the wearer's hips. Through the contact of the pad 181 and pads 231, 232 and straps 233, 234, the backpack is secured firmly around the user's waist and most of the weight of pack 100 and its contents is supported on the wearer's waist, a more efficient and better balanced location than the shoulders.

[0025] The strap assembly 230, which includes pads 231, 232, straps 233, 234 and clasp 235, is secured to pad 181 by integral straps 237, which extend around pad 181. In one preferred embodiment waist assembly 230 is also removably attached to backpack 101.

[0026] As can be best seen in Fig. 4, weight shifting and ventilation system 180 creates an air space between the wearer's back and the backpack assembly 100, generally indicated as 270, which allows air to circulate and prevents a heat build-up and excessive sweating by the user. In this way, the backpack assembly 100 only contacts the wearer's body with the straps 271, 272, the top portion of the backpack 101 and pad 181.

[0027] In a current preferred embodiment of the invention, weight adjustment and ventilation system 180 is permanently attached to integrated hydrating frame 150 and would be removed along with integrated frame 150 as described above by releasing harness straps 201-205. However, in another preferred embodiment of the invention, the weight transferring and ventilation system 180 may be separately removed from the backpack assembly 100 so that the integrated hydrating

frame 150 would contact the wearer's back, along with pad 102 (shown best in Fig. 2).

[0028] Alternatively, weight transferring and ventilation system 180 may be configured as two pods which extend outwardly, supporting on the wearer's back. The pods can include a springy material which provides some shock absorbing characteristics. The pods may be permanently attached to frame 150 or backpack 101, attached with hook and pad connectors or attached with an elasticized webbing bra approach which wraps around frame 150 and weight transferring and ventilation system 180 for a removable installation.

[0029] In addition to the traditional pockets and compartments on a backpack, it is often desirable, particularly when skiing or snowboarding, to obtain access to certain smaller items while the backpack remains in position on the wearer's shoulders. In accordance with a preferred embodiment of the invention, the backpack assembly 100 includes two types of pockets or compartments 240 and 280, which move from a normal storage position which does not interfere with the user's mobility and as second position which is accessible to the user with the backpack still in place. Figs. 4 and 5 show the compartments or pouches 240 and 280 in their storage positions and in their accessible positions. Arrows A and B in Fig. 6 show the direction of movement of movable compartments 240 and 280.

[0030] As best seen in Figs. 4 and 5, pouch 280 rests on top of backpack 101 and is secured to backpack 201 through two bungee style extendable shock cords 281, 282 of conventional manufacture. The shock cords are preferably relatively long and attached to backpack 101 near the bottom of the backpack. The reason for this is that this provides for a lengthy section of shock cord which can then easily stretch the required distance to extend over the user's shoulder and to be held comfortably in front of the user as shown in Fig. 5, where the pouch 280 can be opened, held in place and then closed prior to returning to its at rest, storage position at the user's back.

[0031] This pouch 280 can be utilized for small items such as candy bars or nutritional supplement bars, sunglasses, lip balm, money, portable music device and headphones or suntan lotion. In this way, either while resting at a trail side or while sitting on a ski lift, a user can, with the backpack still in place, easily gain access to various belongings. While the drawing of Fig. 5 shows both portions of straps 281 and 282 on one side of the user's head, the pouch 280 can be pulled directly over the head with both portions of bungee straps 281, 282 on either side of the wearer's head. Similarly, the pouch 280 can be pulled by either hand on either side of the head as is most convenient to the user.

[0032] In practice, movable pouch 280 presents an excellent way to provide access to items while the backpack 101 remains on the wearer's back. Compartment 280 is shown as having a moderate size but the relative size of compartment 280 may be adjusted so that it is

either larger or smaller as indicated by design requirements related to the intended articles to be contained therein. Of course, in conventional fashion, compartment 280 may be opened either with a zipper or other closure mechanism in accordance with conventional technology. In addition, compartment 280 may include various smaller subcompartments within the overall structure for retaining different items.

[0033] Generally, bungee cords 281, 282 extend through openings 283 in compartment 280. Either two cords can be used, or a single bungee cord 281 is used in which both free ends are secured to backpack 101 and bungee cord 281 loops into compartment 280 through one opening 283 and then exists compartment 280 through another opening 283 prior to being connected to backpack 101. In a preferred embodiment, the free ends of single bungee cord 281 are connected on separate sides of backpack 101 so that better lateral stability of compartment 280 in its storage position atop backpack 101 is achieved. Compartment 280 may also be set up so as to ride in a different location on backpack 101. For example, in another preferred embodiment, compartment 280 may ride even with the top of backpack 101 but resting on the surface opposite to that resting against the wearer's back so that the height component of the backpack is not affected and only the relative depth of the backpack from the wearer's back outward is affected. Similarly, compartment 280 may be found on one side or both sides of backpack 101 in the event that there is a need for access to different items, which are preferably segregated in different compartments.

[0034] Particularly where advanced backpack 101 is intended to be used for technical uses, such as mountaineering, rock climbing or polar expeditions, there may well be a need for multiple movable compartments accessible while the pack remains in position on the wearer's back. In those cases the wearer may well require that multiple movable compartments be utilized so that different components, equipment, garments or other materials can be easily accessed separately with the more limited manual dexterity available under those extreme conditions. Under those extreme conditions, bungee cord 281 may be replaced by other, more suitable elastic materials enclosed in a fashion such that the cold or other conditions will not affect their flexibility or integrity.

[0035] In addition to compartment 280, which is held in place against the surface of backpack 101, an additional type of movable compartment or pouch 240 constructed in accordance with a preferred embodiment of the invention is depicted. With reference to Figs. 2, 4, 5, 6 and 7, one or two side movable compartments 240 are shown. Compartments 240 are intended to also have two positions. A first, storage position, which is generally located over the hip pads 231, 232 and an accessible position in front of the user's torso as shown in Figs. 5 and 6. In many cases, when the user is actively engaged in sporting activities such as skiing, snow-

boarding or mountain climbing it is important that the user's mobility and flexibility be maximized and any interferences with such flexibility and mobility be eliminated or reduced to the extent possible. So, the movable pockets 240 are generally biased so as to remain in a storage position out of the user's usual range of motion. However, when the user wishes to access these movable compartments or pouches 240, they should be in a generally accessible location, preferably at the front of the torso. For example, when a skier returns to the ski lodge and needs access to money and keys, they should be in front. When the skier goes back outside for skiing, the pouches 240 should be returned to their storage positions.

[0036] In current preferred embodiments the movable pouches 240 are associated with and connected to the straps 233, 234 used to secure the hip pads and backpack 101 to the wearer's torso. In practice, in addition to the torso encircling belt utilized for support including hip pads 231, 232, straps 233, 234, and closure mechanism 235, there is a second belt 241 that is generally secured either to the inner belt 231, 232, weight transferring section 180 or backpack 101. Pouches 240 include a channel 243 formed by a strap sewn or otherwise affixed along its long edges to the back surfaces of pouch 240 as shown best in Fig. 7. The effect of this is that the pouches slide along belt 241, which, in a preferred embodiment, is made of a thin nylon strap which has a width of approximately a half inch to an inch and a half and has its free ends attached along with straps 233 and 234 to buckle 235. This has the effect of assuring that guide belt 241 stays in place about the wearer's torso, generally around the wearer's waist and hips. Alternatively, belt 241 can be a string-like belt. Then, pouch 240 can slide along strap 241 from a position toward the side or back of the wearer's waist to a position proximate the front of the wearer's waist along strap 241. In addition, a bungee cord 246 extends from a portion near the rear of strap 241 where it is secured in a connector 248 through a series of guide loops 247 on the back surface of pouch 240 in a generally U-shaped configuration around strap 242. The other free end of bungee cord 246 is also attached to connector 248 towards the back of the strap or outer belt 241 so that pouch 240 tends to be biased towards a position closer to the back of the wearer's waist.

[0037] In a current preferred embodiment there are two pouches 240, one on each side of the wearer's body. In this circumstance, each of pouches 240 includes a loop strap 244 which holds a closure mechanism 245 which mates with the corresponding closure 245 on the other pouch. In this way, as shown in Fig. 6, the user may couple the pouches 240 together in the front so that they stay in the accessible position.

[0038] In this way, when the user requires access to the items in the pouch or wishes to put items into pouches 240 they can be maintained in the position in front of the user. Again, pouches 240 may be varied in size and

shape and may each have one or more compartments within the pouches or specialized sections or closure mechanisms within the pouch as indicated in accordance with conventional pouch and compartment technology.

[0039] When the user has no further need for the pouches 240 in front, closure mechanism 245 can be disengaged and the biasing force of bungee cords 246 will tend to move the pouches 240 back to their storage position along strap 241 closer to the back and side of the wearer's waist. In another preferred embodiment, no biasing mechanism is utilized and the user manually moves the pouches 240 to a storage position. In fact, the pouches 240 may be locked in a storage position by a similar strap and closure mechanism as is used to lock them in the front. Other closure systems can be used to hold pouches 240 in the storage and accessible position. Multiple pouches 240 can also be placed on strap 241 if desired.

[0040] Reference is next made to Fig. 8 wherein a fanny pack construction, generally indicated as 300 in accordance with the preferred embodiment of the invention is depicted. Fanny pack 300 is set up with a dual strap arrangement as in the pouch arrangements of Figs. 1-7. However, in this case, there is only a fanny pack and no separate backpack. Here, the inner belt 320 holds the fanny pack arrangement firmly around the user's waist. The second, outside strap 301 is secured also to the closure 302 which acts to secure the supporting belt 320 together. The pouch 340 includes a bungee cord 341 and guide loops 342 which are secured to the primary belt and a connector 343. In this case, the pouch 340 can be moved in either direction around the outer strap 301. Connectors 344 are designed to operate with connectors 345 attached to the strap proximate the couple 302 to hold the pouch towards the front of the user's waist. Depending upon whether the user wishes to use the left or right hands to pull pouch 340 to the front, either snap closure 345 may be used.

[0041] As skiing, snowboarding and mountaineering have increased in popularity and as more equipment and clothing alternatives become available for use, a greater number of participants find the need to carry equipment, clothing, food, fluids, money, suntan lotion, lip balm, sun glasses and various other sundry items. The backpack is suitable for carrying large or bulky items such as coats, sweaters, shoes, portable music devices and gaming devices. Because the backpack is carefully adjusted to the wearer's body by adjusting the shoulder straps, waist straps and perhaps other straps conventionally used such as stabilizing straps worn across the front of the wearer's torso, which connect the shoulder straps to each other so that the backpack does not shift laterally, it is generally undesirable to remove the backpack to gain access to small items. Thus, the movable pouches either move freely as in connection with pouch 280, or slidably movable as with pouch 240, which is particularly useful for providing ready and con-

venient access to items contained therein while preventing the pouches from interfering with the sporting activity by returning to a storage position.

[0042] Reference is next made to Figs. 9 and 10 in which an integrated backpack assembly, generally indicated as 400 is shown. Backpack assembly 400 includes a backpack portion 401, which includes shoulder straps(not shown), as in the previous embodiments and a main compartment with desired zippers or other conventional closures. Backpack assembly 400 also includes two lower compartments 402 and 403 which are at the bottom of backpack portion 401. These compartments are connected to a dual strap arrangement 404 similar to that found in in the embodiments of Figs. 1-7 and 8. In addition, as best seen in Fig. 10, two hook or mat pads 406 and 407 rest against the back surface of the lower end of backpack 400, below compartment 401, to mate with matching pads(not shown) on the back of compartments 402 and 403 so that compartments 402 and 403 remain firmly in place at the bottom of compartment 401, as shown in Fig. 9 when the compartments are not needed. However, by pulling on either of compartments 402 and 403 the compartments can be slid along the strap not used for securing the straps around the wearer's waist. It can also be retained in a position at the front by attaching it with a connector to the other compartment as described above in the embodiment of Figs. 1-7. In addition to this, a series of elastic shockcords can be used to bias the compartments 402 and 403 to the back so that they move back to their original positions without the need to push them back. Generally, it is preferred if compartments are made so that the walls are relatively rigid to maintain their shape and provide a pleasing finished arrangement when compartments 402 and 403 are in the positions shown in Fig. 10. In addition to the configuration shown in Figs. 9 and 10, additional arrangements in which the movable compartments are smaller, with a non-movable section in the middle or other arrangements in which one or more compartments fit into the rest of the backpack in an integrated fashion.

[0043] One of the most debilitating needs of outdoor activities is the need to replenish fluids. Often, there is severe discomfort when a skier, snowboarder or mountaineer does not actively hydrate themselves over a period of hours. Carrying containers of fluids is often inconvenient and dangerous as the containers can have sharp edges or hard surfaces which might cause injury if carried by the user. The integrating hydrating frame system disclosed provides numerous benefits over previous approaches. The hydrating frame member creates a sturdy frame to the backpack while efficiently using the interior volume of the frame as a reservoir for the water or other liquid. The dual use of the frame and the water reservoir in a single structure, which is selectively removable from the backpack, adds great value and utility to the backpack system. This is further heightened when the weight adjusting and ventilation system pod is

added to the bottom of the integrated hydrating frame. The weight adjusting pod shifts the bulk of the weight of the backpack system to the hips and waist area and provides a ventilation airway between the wearer's back and most of the backpack so that overheating is avoided. On the other hand, if merely a brief trip or limited number of items need to be carried by the user, the integrated hydrating frame and weight shifting and ventilation system can be removed from the remaining portion of the backpack and the backpack used in a conventional fashion without affecting its utility.

[0044] While the integrated hydrating frame has been shown with an external frame, it is possible to make an internal frame. Various approaches can be utilized when the frame is used internally. Either a suitable receiving pocket can be established, a series of straps to hold the frame in place, or a product configuration so that the inner frame fits snugly in a preferred location within the pack. However, the current and preferred embodiment of the invention has the integrated hydrating frame as an external frame which provides easier access to the hydrating system and enables the use of the integrated hydrating frame as a support for the weight shifting and ventilation system.

[0045] While there have been fanny packs and other waist supported pouch structures in the past, the slidable pouches utilizing a secondary strap or belt to provide a slidable pouch which can move from a storage position which does not interfere with the user's activities and an accessible position where the contents of the pouch can be manipulated provides substantial benefits. Additional benefits are provided where a biasing mechanism tends to move the pouch back to the storage position when not retained in the accessible position. By using closure mechanisms to keep the pouch in the desired position, increased reliability is achieved.

[0046] The ability to access a movable pouch coupled to the backpack through one or more elastic cords or other members provides for selective and easy access to materials which would otherwise require placement in a backpack and which would require the backpack itself to be removed prior to achieving access to these items. This movable pouch system essentially returns the pouch to its storage position without any substantial manipulation required.

[0047] Accordingly, an improved advanced backpack is provided. The advanced backpack system includes an integrated hydrating frame member and a weight shifting and ventilation system, both of which can be selectively removed from the backpack as required. In addition, two different types of movable pouch systems are provided, which allow free access to materials and enable movement of the pouches from a storage position where there is no interference with the user's activities, to an access position where ready access to the items in the pouches is achieved. Finally, the pouches can then be returned easily to their storage positions, either manually or with the use of biasing mechanisms.

[0048] In addition, an improved waist or chest based removable pouch system is provided in which a dual belt system is utilized. One belt retains the straps and pouches in place around the waist, chest, arms or legs of the user and a second belt is used to slide the one or more pouches from a storage position to an access position and vice-versa.

[0049] It will thus be seen that the objects set forth above, among those made apparent in the preceding description, are efficiently obtained and, since certain changes may be made in the above constructions without departing from the spirit and scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative, and not in a limiting sense.

[0050] It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention, herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Claims

1. An integrated backpack system, comprising:

a backpack, including an inner compartment and an exterior surface, the exterior surface including at least a first surface for facing the user's back in an operative position;
 strap means secured to the backpack for supporting the backpack on the user's shoulders;
 integrated hydrating frame means for storing a liquid and providing a substantially rigid support to the first surface of the backpack;
 harness means, coupled to the backpack proximate to or on the first surface of the backpack, for securing the integrated hydrating frame means to the first surface of the backpack;
 a hydrating system, coupled to the integrated hydrating frame means for enabling a user to withdraw the liquid stored in the integrated hydrating frame means;
 the integrated hydrating frame means being further adapted to rest between the first surface of the backpack and the user's back when the backpack is supported on the user's shoulders by the strap means;

whereby an integrated backpack system with a frame provided by an integrated hydrating system is provided.

2. The integrated backpack system of Claim 1 wherein the integrated hydrating frame means is formed as a hollow member with the liquid stored inside the hollow portion of the integrated hydrating frame means.

3. The integrated backpack system of Claim 1 wherein the integrated hydrating frame means is formed as a rigid hollow member which forms a reservoir for the hydration system and includes an access opening to the reservoir through which the hydration system is coupled. 5
4. The integrated backpack system of Claim 3 wherein the rigid hollow member is formed into a shape which creates a stable frame for the backpack and is ergonomically adapted to the shape of the user=s back. 10
5. The integrated backpack system of Claim 1 wherein the integrated hydrating frame means includes a handle section for gripping and carrying the backpack. 15
6. The integrated backpack system of Claim 1 wherein the integrated hydrating frame means is formed as a hollow, thin-walled member out of a rigid, but flexible plastic. 20
7. The integrated backpack system of Claim 1 wherein the backpack includes a padding system on the first surface which engages with the integrated hydrating frame means when the integrated hydrating frame is secured to the first surface to provide an ergonomically shaped surface. 25 30
8. The integrated backpack system of Claim 1 wherein the harness means releasably secures the integrated hydrating frame means to the backpack.
9. The integrated backpack system of Claim 1 further comprising weight adjusting means, coupled to or proximate the first surface of the backpack, for spacing the first surface of the backpack from the user=s back. 35 40
10. The integrated backpack system of Claim 9 wherein the weight adjusting means is a pod having a back touching surface which is adjusted to rest against the user=s back proximate the user=s hips or waist. 45
11. The integrated backpack system of Claim 10 wherein the back touching surface of the pod is formed of a pliable material.
12. The integrated backpack system of Claim 1 further comprising a retractable compartment, the compartment comprising: a compartment coupled to the backpack having a first, storage position and a second, accessible position and biasing means, coupling the compartment to the backpack and allowing the compartment to move relative to the backpack from the storage position to the accessible position and back to the storage position. 50 55

13. An integrated backpack system, comprising:

a backpack, including an inner compartment and an exterior surface, the exterior surface including at least a first surface for facing the user=s back in an operative position; strap means secured to the backpack for supporting the backpack on the user=s shoulders and proximate the user=s back; a pod system, secured to or proximate to the first surface of the backpack, proximate a user=s waist or hips, which shifts weight to the user=s hips and waist and separates a portion of the first surface of the backpack from the user=s back; harness means, coupled to the backpack, for securing the backpack around the user=s torso;

whereby an integrated backpack system with a weight shifting and ventilating system is provided.

14. An integrated backpack system, comprising:

a backpack, including an inner compartment and an exterior surface, the exterior surface, the exterior surface including at least a first surface for facing the user=s back in an operative position; first strap means secured to the backpack for supporting the backpack on the user=s shoulders and proximate the user=s back; second strap means secured to the backpack for supporting the backpack around the user=s torso; third strap means, secured to the backpack or the second strap means for encircling the user=s torso; and movable pouch means, coupled to the third strap means for moving along the third strap means between a storage position and an access position;

whereby an improved integrated backpack system with a movable pouch which slides from a storage position to an access position without the backpack having to be removed from the user=s shoulders is provided.

15. An integrated backpack system, comprising:

a backpack, including an including an inner compartment and an exterior surface, the exterior surface including at least a first surface for facing the user=s back in an operative position; strap means secured to the backpack for supporting the backpack on the user=s shoulders and proximate the user=s back;

a pouch for containing articles; and
 a pouch connection means coupled to the
 backpack and to the pouch for allowing the
 pouch to move from a first, storage position to
 a second, access position.

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- 16.** The integrated backpack system of Claim 15,
 wherein the pouch connection means includes at
 least one elastic shockcord connected proximate a
 first end of the shockcord to the backpack and proximate
 to the other end of the shockcord to the
 pouch, the elastic shockcord having sufficient elas-
 ticity such that it stretches from a rest position cor-
 responding to the storage position to a greater
 length where the pouch can be moved to the access
 position.

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- 17.** An integrated backpack system, comprising:

a backpack, including an including an inner
 compartment and an exterior surface, the exte-
 rior surface including at least a first surface for
 facing the user's back in an operative position;
 strap means secured to the backpack for sup-
 porting the backpack on the user's shoulders;
 integrated hydrating frame means for storing a
 liquid and providing a substantially rigid support
 to the first surface of the backpack;
 harness means, coupled to the backpack prox-
 imate to or on the first surface of the backpack,
 for releasably securing the integrated hydrating
 frame means to the first surface of the back-
 pack;
 the integrated hydrating frame means being
 further adapted to rest between the first surface
 of the backpack and the user's back when the
 backpack is supported on the user's shoulders
 by the strap means;

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whereby an integrated backpack system with
 a removable frame formed by an integrated hydrat-
 ing system frame is provided.

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- 18.** An integrated backpack system, comprising:

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a backpack, including an including an inner
 compartment and an exterior surface, the exte-
 rior surface including at least a first surface for
 facing the user's back in an operative position
 and a second surface opposite to the first sur-
 face for defining the depth of the backpack be-
 tween the first and second surfaces, and a cav-
 ity formed by the second surface being at a po-
 sition where the depth of the backpack is re-
 duced;
 strap means secured to the backpack for sup-
 porting the backpack on the user's shoulders
 and proximate the user's back;

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a pouch for containing articles; and
 a pouch connection means coupled to the
 backpack and to the pouch for allowing the
 pouch to move from a first, storage position in
 the cavity to a second, access position.

- 19.** The integrated backpack system of Claim 18,
 wherein the cavity is formed at the bottom of the
 backpack and the pouch is shaped to fit within the
 pouch.

- 20.** The integrated backpack system of Claim 19,
 wherein the cavity is generally rectangular in shape
 and the pouch is generally rectangular in shape.

- 21.** The integrated backpack system of Claim 20,
 wherein there are two pouches which both fit in the
 cavity.

- 22.** The integrated backpack system of Claim 21,
 wherein the two pouches can be independently
 moved to access points proximate the user's front.

- 23.** The integrated backpack system of Claim 18,
 wherein the cavity is formed at the bottom of the
 backpack so that the pouch fits beneath a main
 compartment of the backpack when it is in its se-
 cured position.

- 24.** The integrated backpack system of Claim 18,
 wherein the pouch connection means includes a
 strap secured around the user's torso along which
 the pouch is constrained to move from the secured
 position to the access position.

- 25.** The integrated backpack system of Claim 24,
 wherein the pouch connection means includes a bi-
 asing means coupled to the backpack and to the
 pouch for returning the pouch from the access po-
 sition to the secured position in the cavity.

- 26.** The integrated backpack system of Claim 25,
 wherein the biasing means is formed from a stretch-
 able cord.

- 27.** The integrated backpack system of Claim 25,
 wherein the biasing means is formed of a retracta-
 ble cord system.

- 28.** The integrated backpack system of Claim 18 where-
 in the pouch connection system includes a pouch
 strap around the user's torso.

- 29.** The integrated backpack system of Claim 28,
 wherein the pouch connection means includes a
 support strap around the user's torso to which the
 pouch strap is secured.

30. An integrated backpack system, comprising:

a backpack, including an inner compartment and an exterior surface, the exterior surface, the exterior surface including at least a first surface for facing the user's back in an operative position; 5
first strap means secured to the backpack for supporting the backpack on the user's shoulders and proximate the user's back; 10
second strap means, secured to the backpack for encircling the user's torso; and
movable pouch means, coupled to the second strap means for moving along the second strap means between a storage position and an access position; 15

whereby an improved integrated backpack system with a movable pouch means which slides from a storage position to an access position without the backpack having to be removed from the user's shoulders is provided. 20

31. The integrated backpack system of Claim 30 further including biasing means for moving the movable pouch means from the from the access position to the storage position. 25

32. The integrated backpack system of Claim 31 wherein the biasing means includes a retractable member secured to the backpack and to the movable pouch means. 30

33. The integrated backpack system of Claim 31 wherein the biasing means includes a stretchable cord secured to the backpack and to the movable pouch means. 35

34. The integrated backpack system of Claim 30 wherein the movable pouch means includes two pouches, each of which moves from its secured position to its access position. 40

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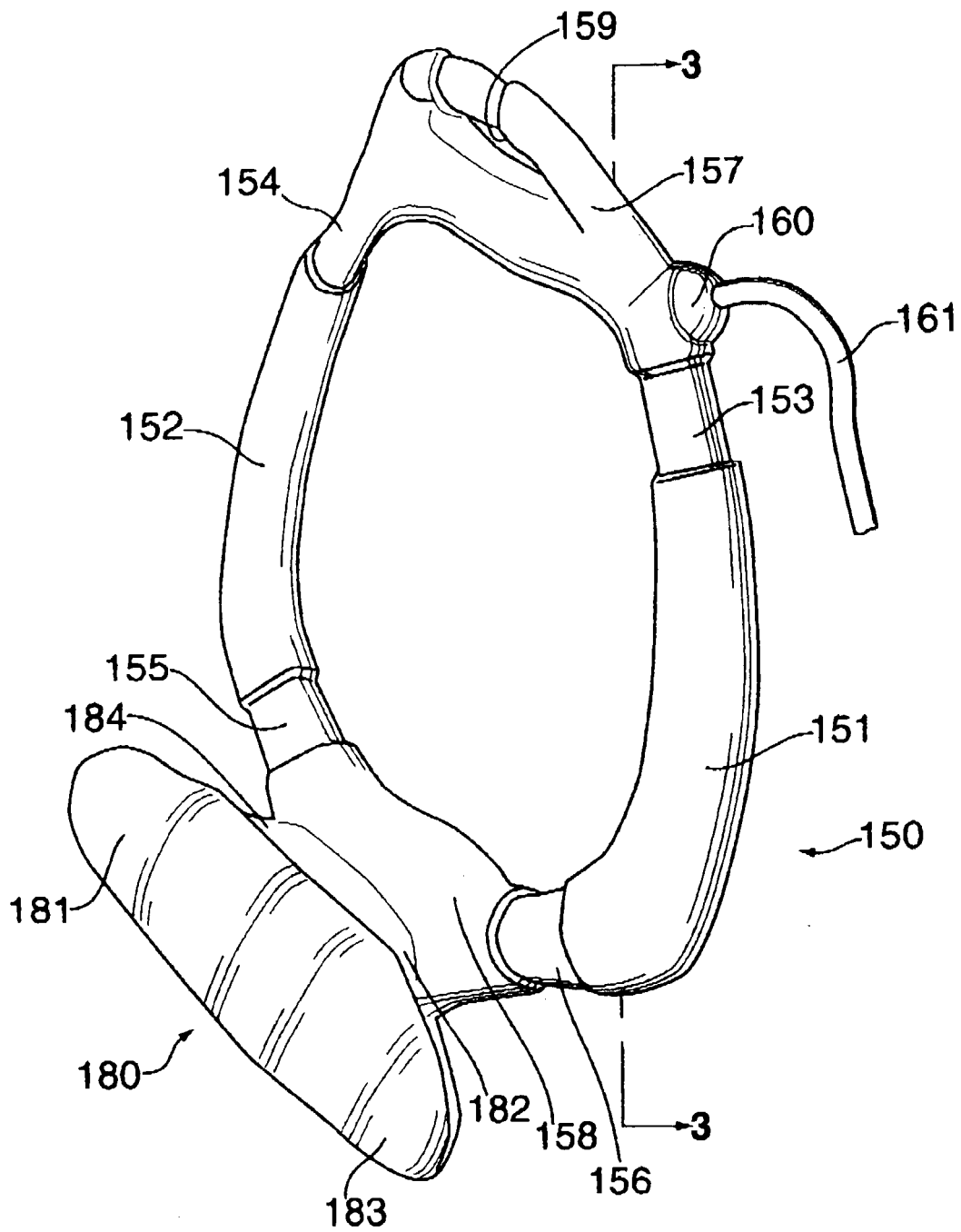


FIG. 1

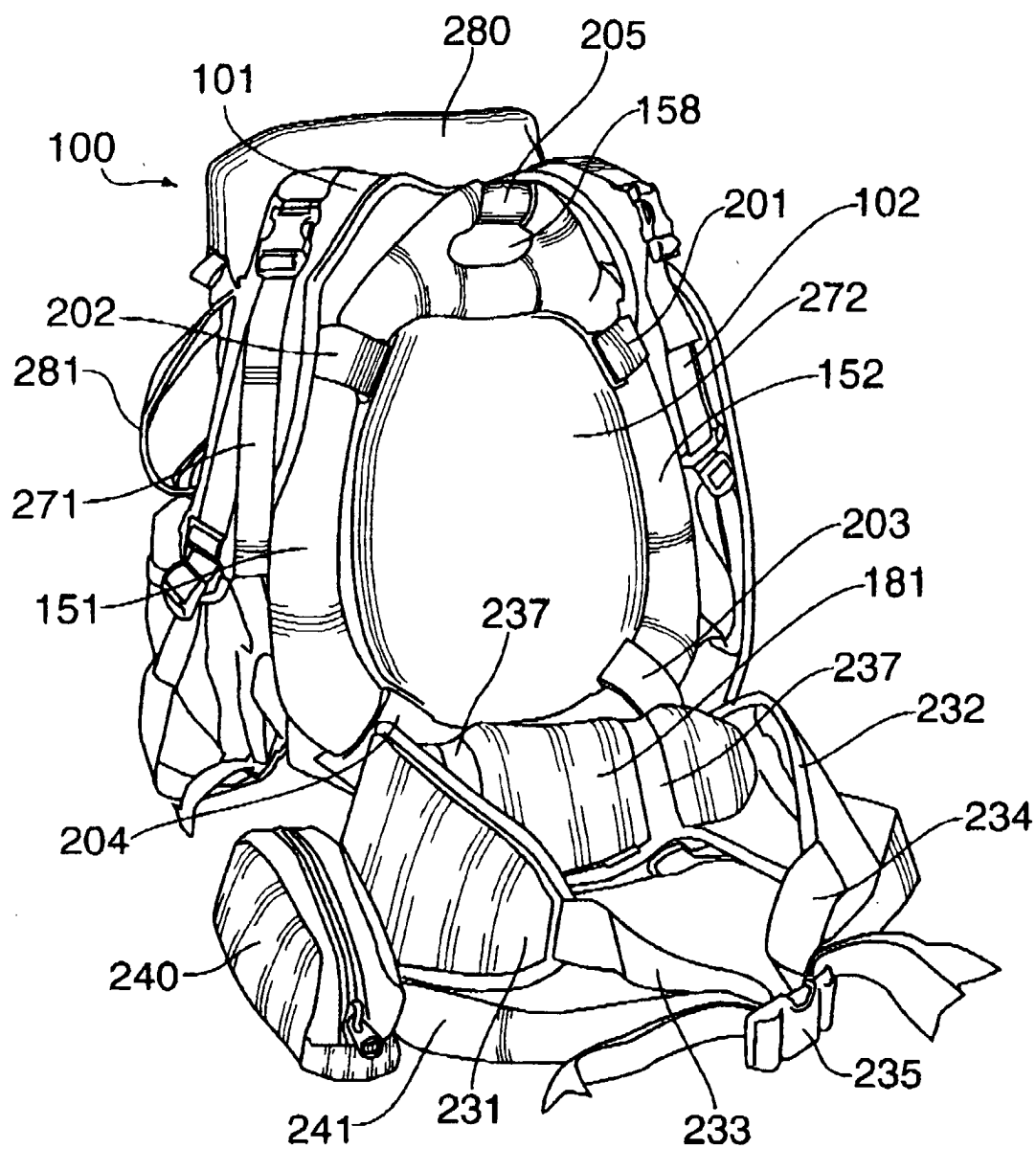


FIG. 2

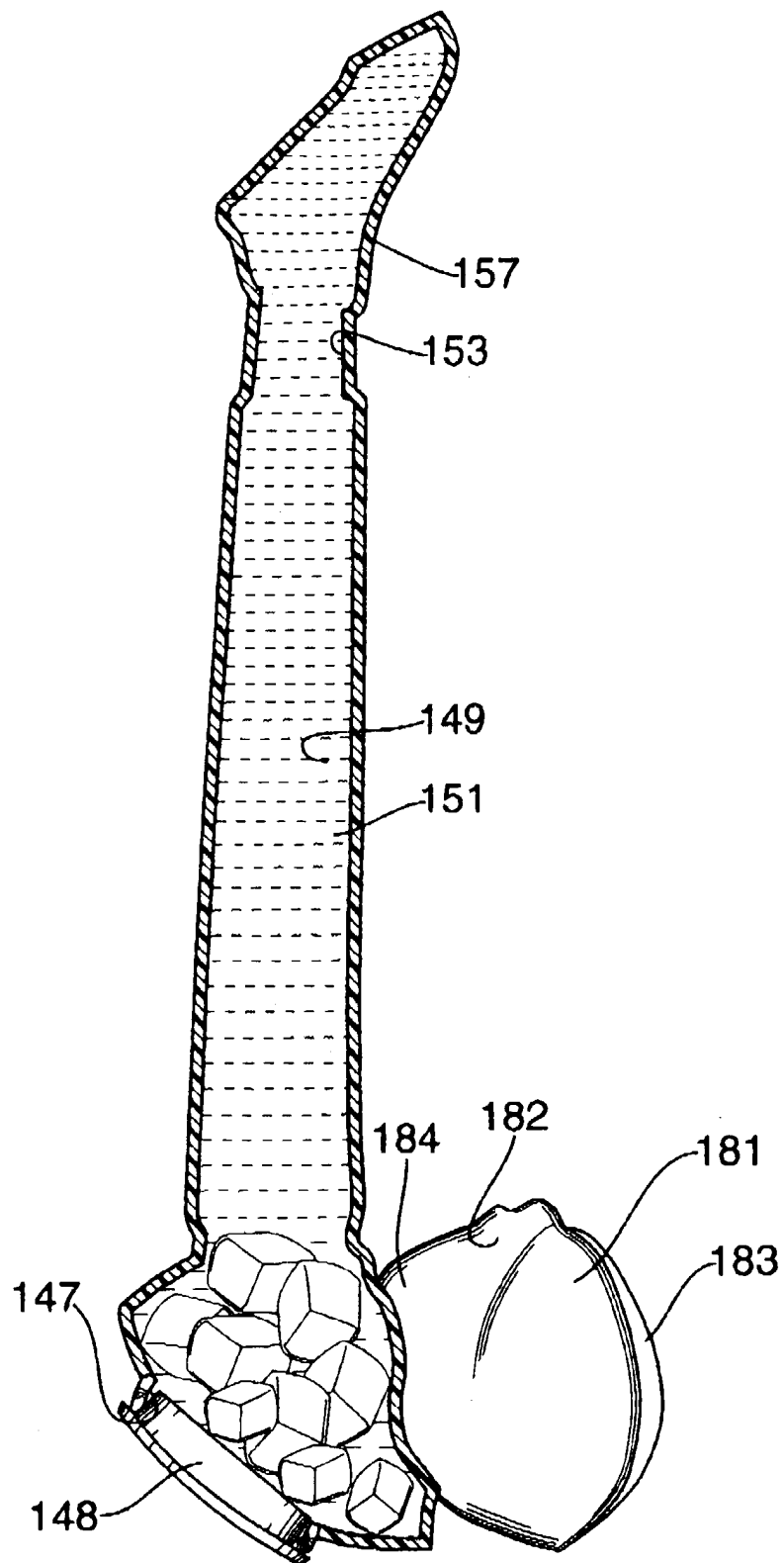


FIG. 3

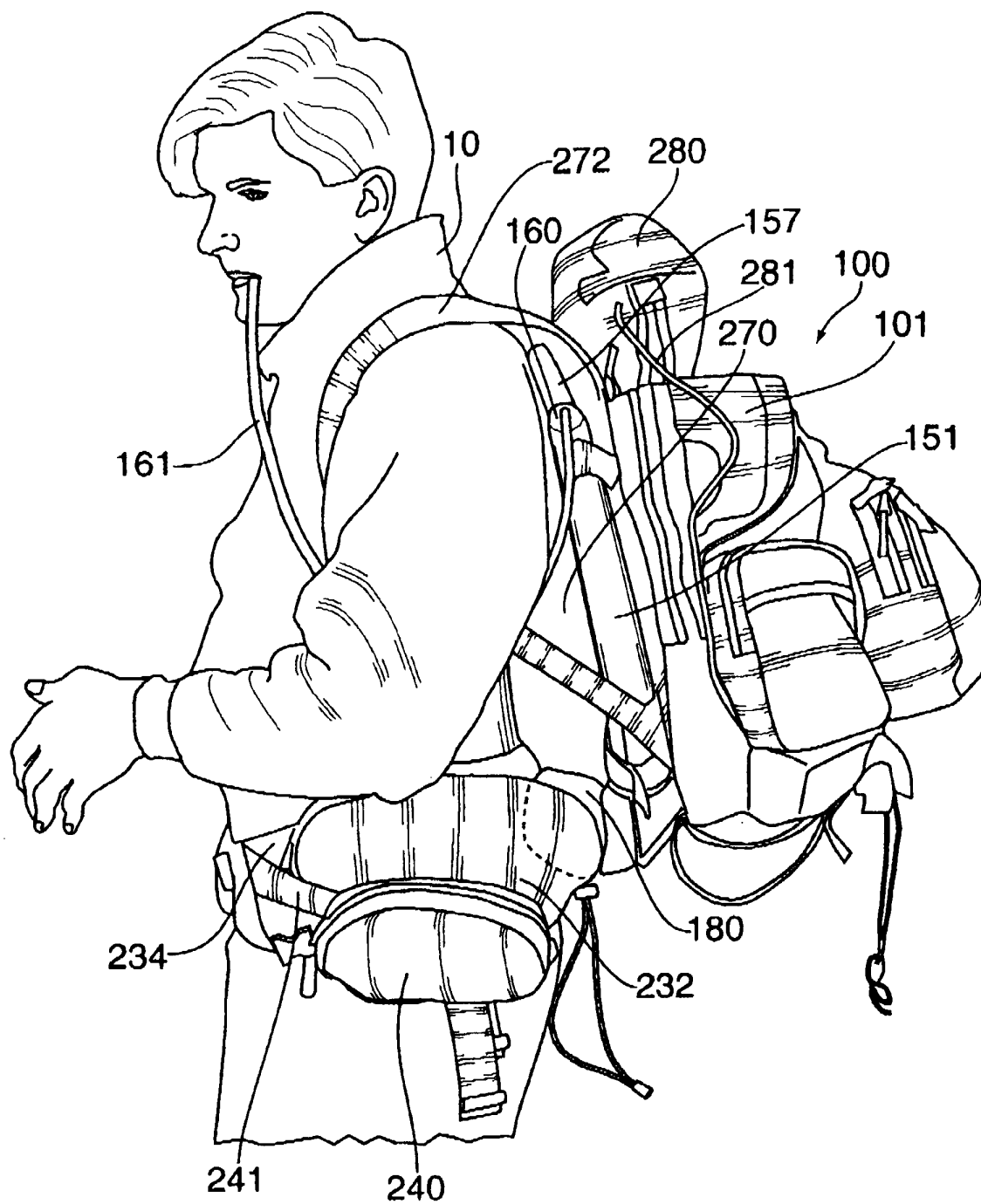
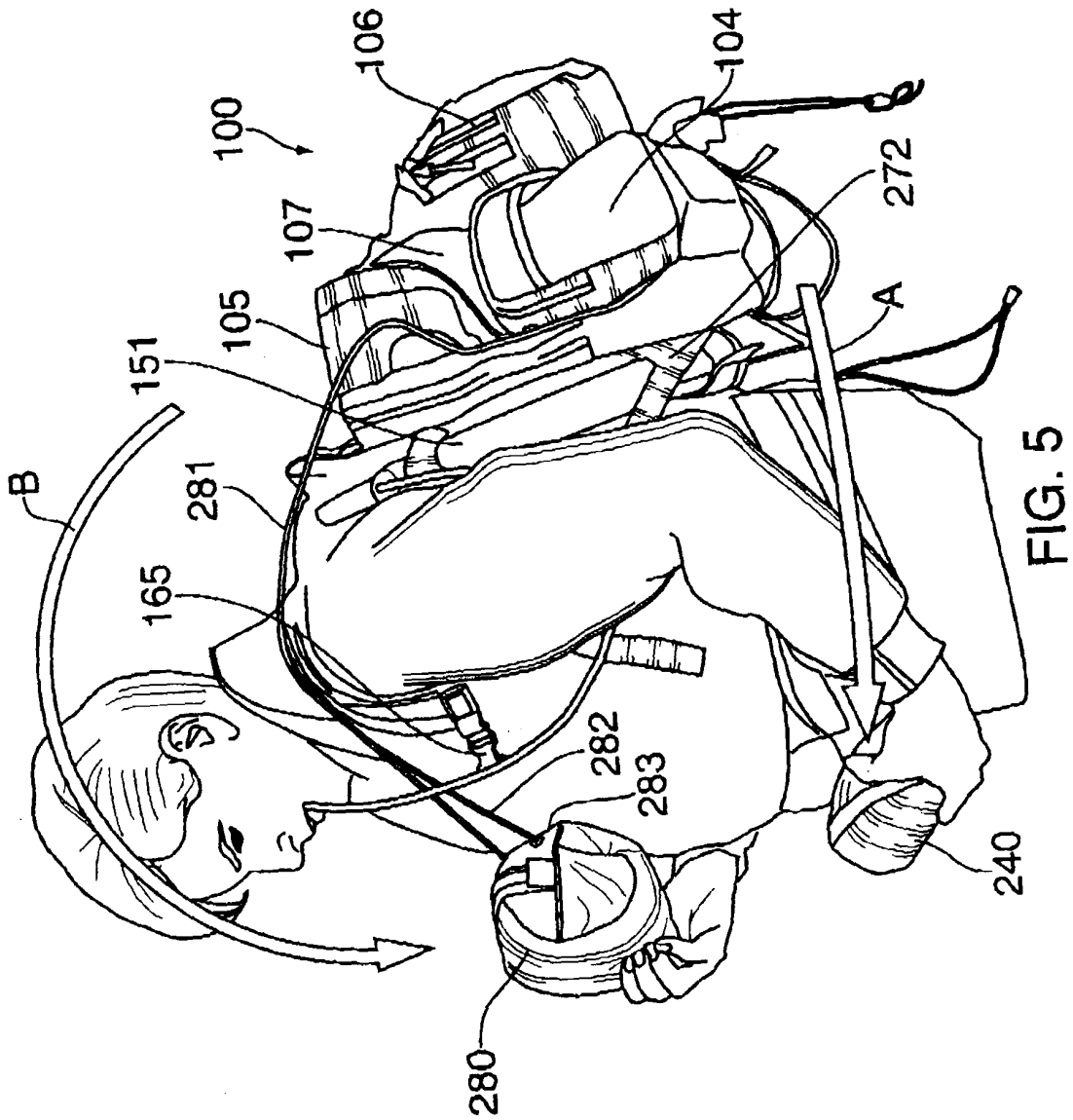


FIG. 4



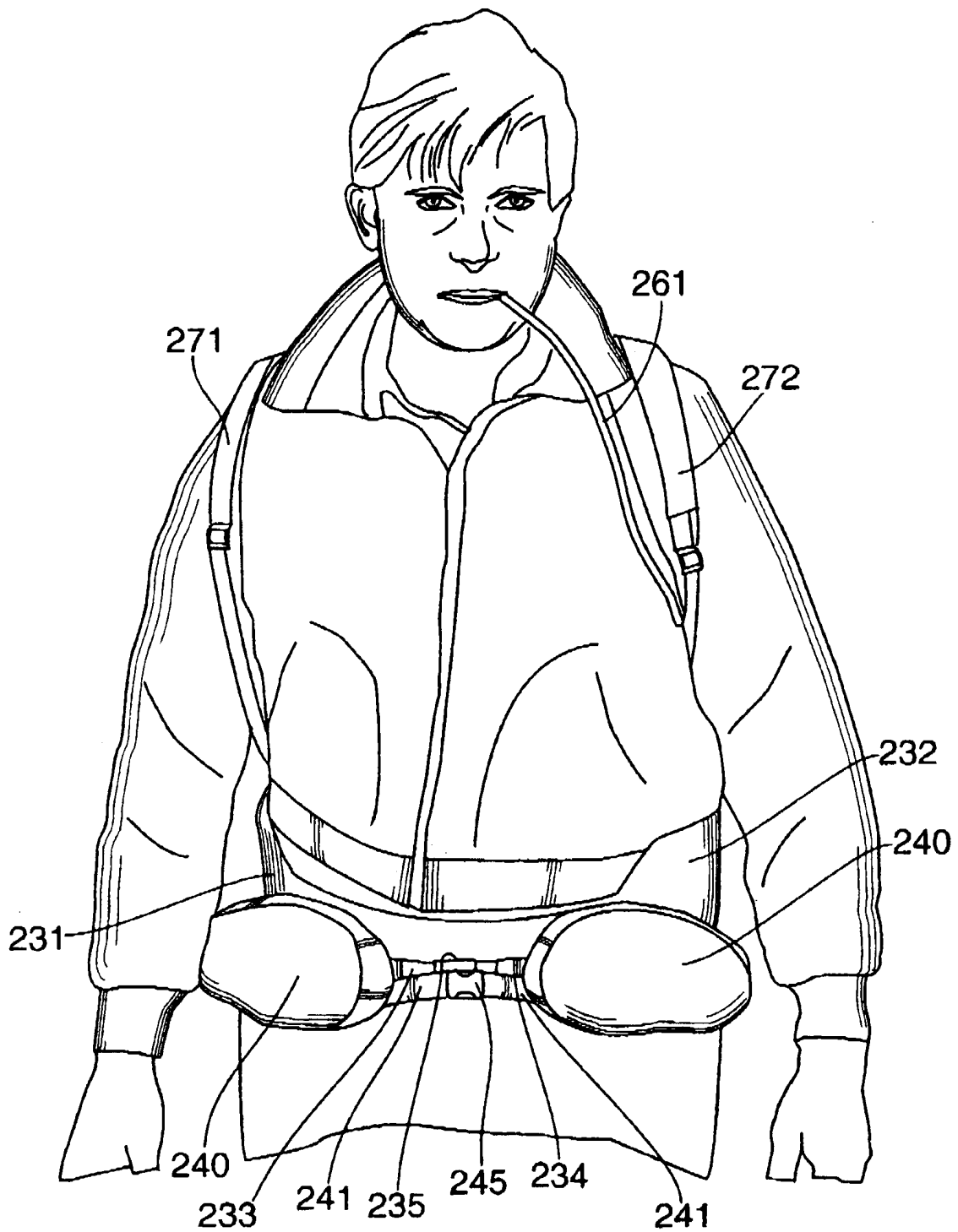
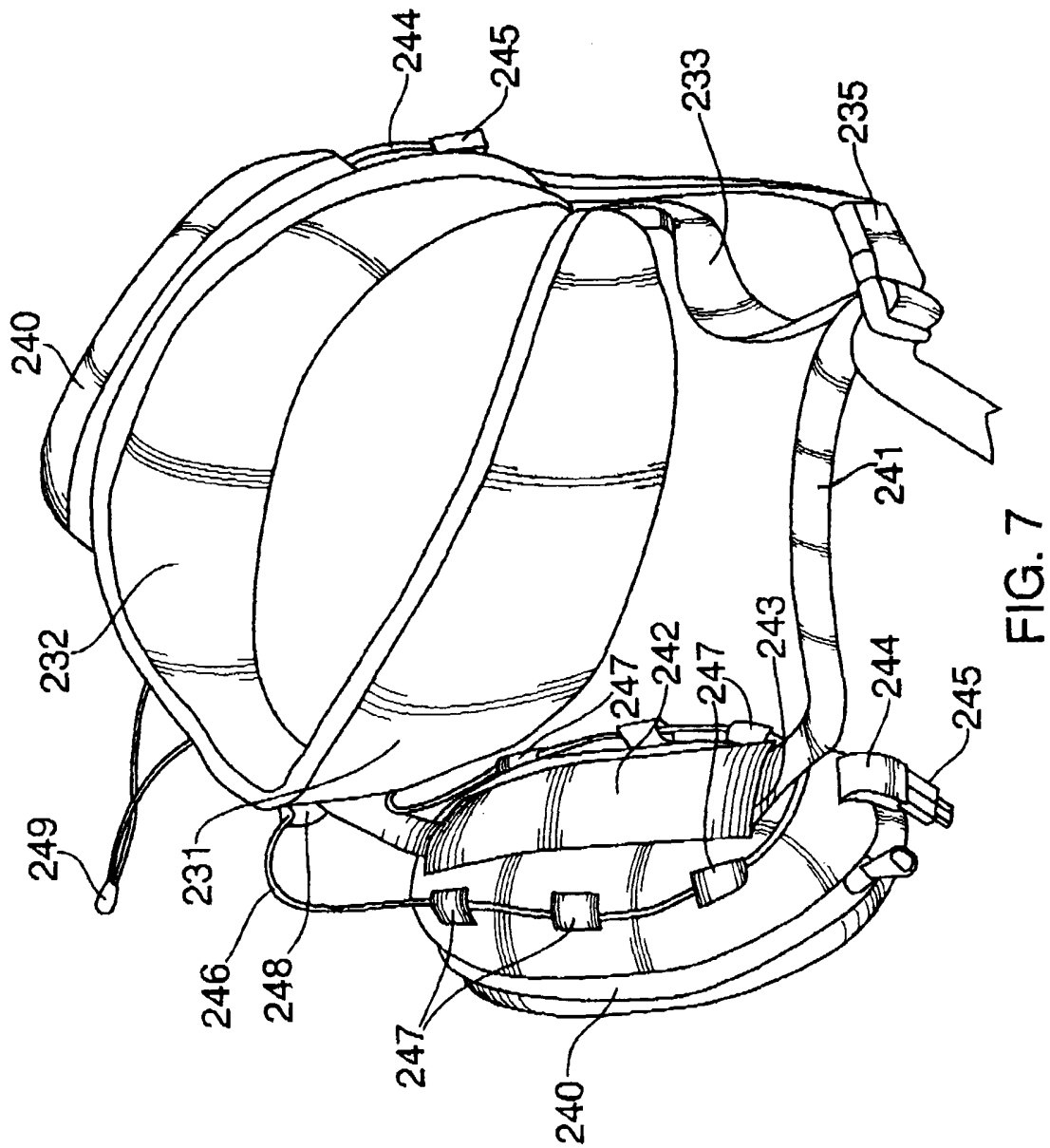
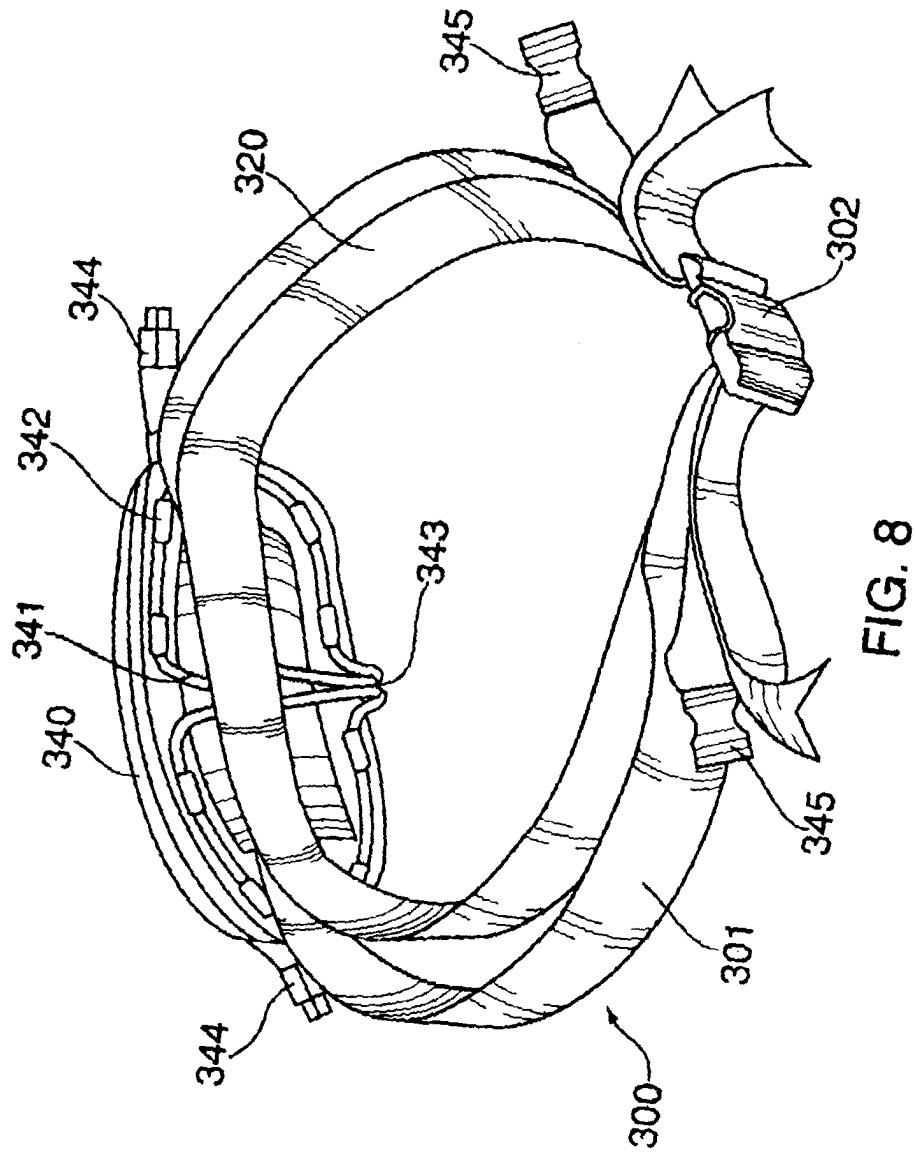


FIG. 6





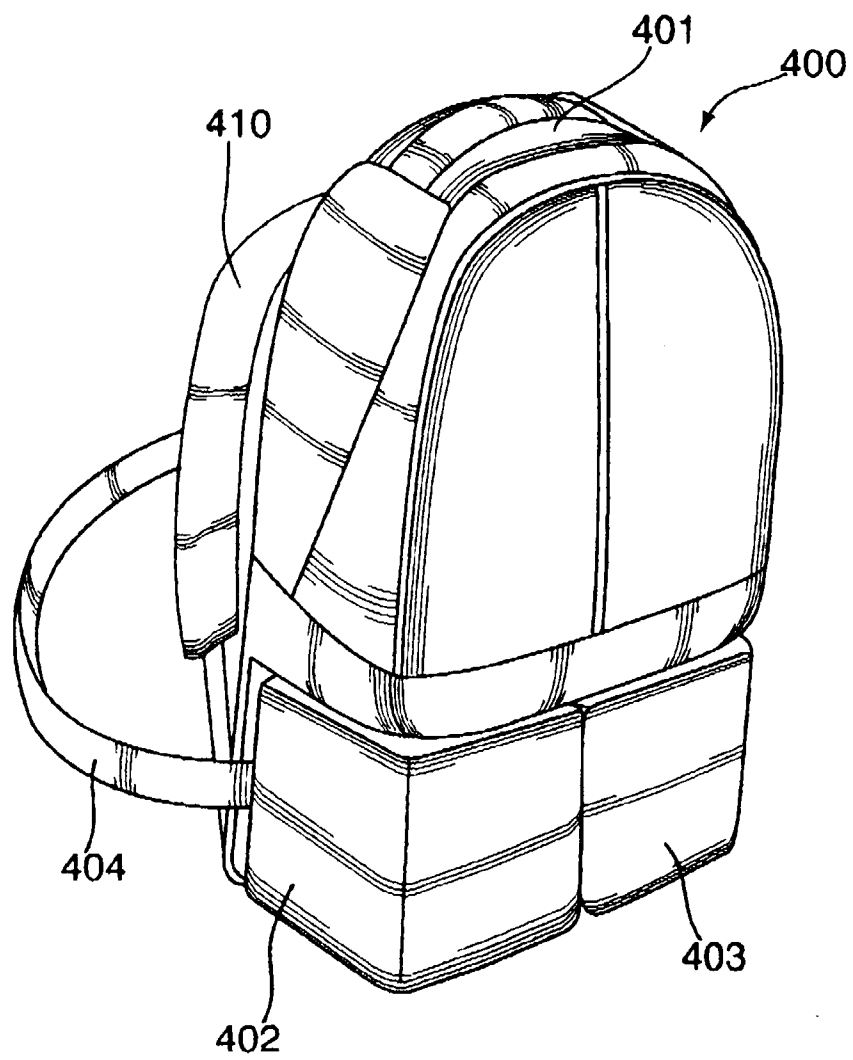


FIG. 9

