

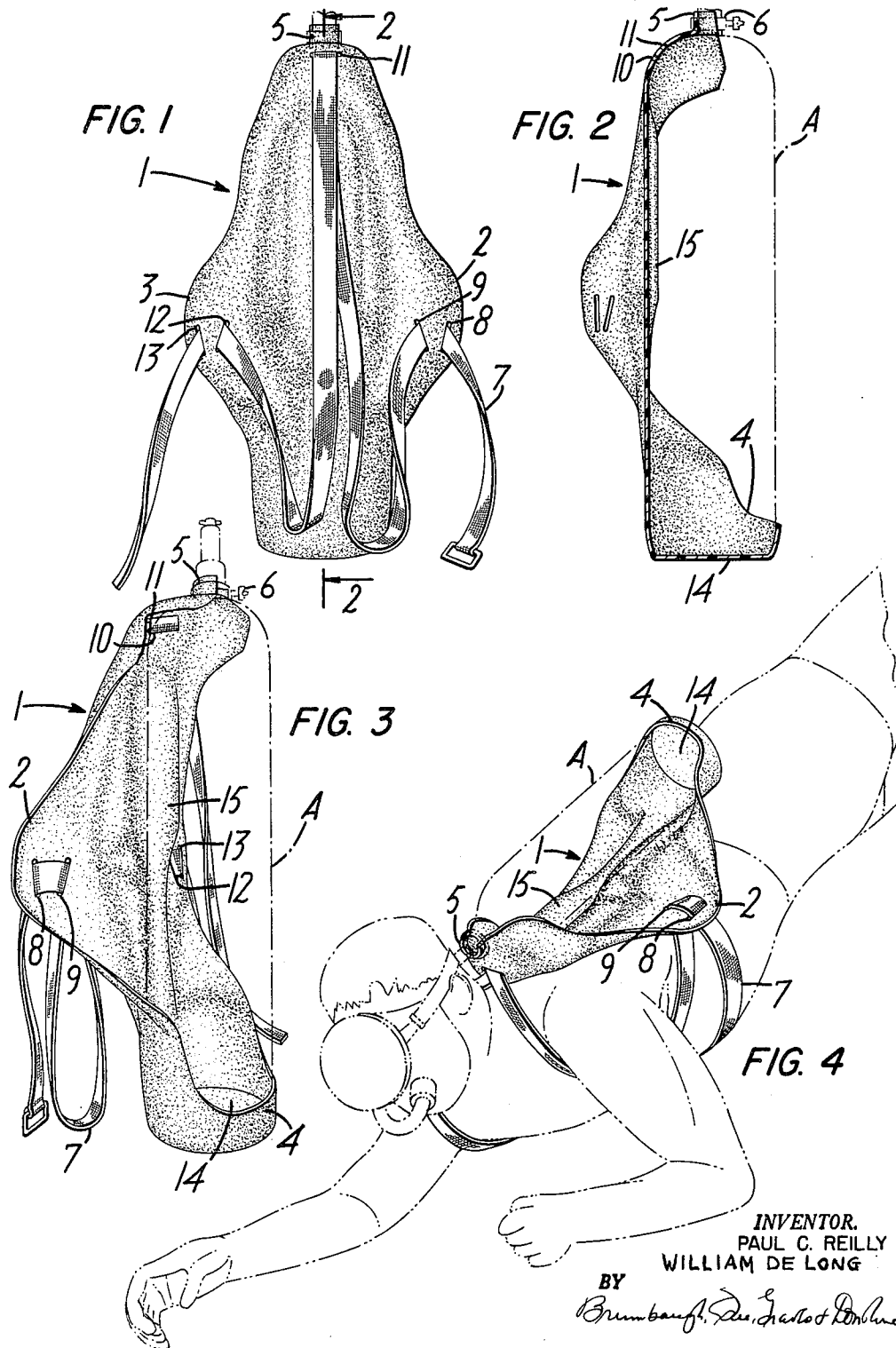
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BACKPACK FOR AIR TANK FOR UNDERWATER DIVERS

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BACKPACK FOR AIR TANK FOR UNDERWATER DIVERS

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4 Claims. (Cl. 224-5)

This application is a continuation of applicants' co-pending application, Serial No. 95,309, filed March 13, 1961.

This invention relates to a novel backpack which makes it possible to carry an air tank more comfortably and securely than means heretofore available for carrying air tanks.

The novel backpack of the present invention includes a rigid frame having a back-engaging side, a receptacle at the bottom of the rigid frame on the side opposite the back-engaging side for receiving the base of the air tank therein, and means at the top of the rigid frame on the side opposite the back-engaging side for retaining the upper neck end of the air tank.

The backpack of the present invention is intended to be secured to the back of the carrier by a strap or harness, and when properly secured, it holds the air tank securely without the side-to-side motion that is characteristic of conventional harnesses. The backpack is also much more comfortable for the carrier, since the weight of the heavy air tank is distributed by the rigid frame over a relatively large area of his back on both sides of the spine but out-of-contact with the spine.

In the preferred embodiment, the backpack of the present invention has a flat base permitting it to stand in upright position on the ground with an air tank accommodated therein while not in use. This is a distinct advantage over conventional air tank carrying harnesses, since the air tanks are heavy and are not designed to stand in upright position of their own accord.

Still another advantage of the backpack of the present invention is that the air tank can be quickly mounted to the backpack simply by inserting the base in the receptacle at the bottom and securing the neck portion of the cylinder to the neck retaining means at the top. In contrast, it is much more difficult to secure the air tanks to conventional harness arrangements. Moreover, the backpack is more readily donned by the carrier, particularly inasmuch as the rigid construction of the backpack prevents entanglement of the harness. In this connection, the backpack, in its preferred form, includes laterally extending wings to which a harness or strap is attached which still further minimizes the possibility of entanglement.

For a complete understanding of the present invention, reference should be made to the detailed description which follows, and to the accompanying drawings, in which:

FIGURE 1 is a view of the back-engaging side of the backpack of the present invention with a harness affixed thereto;

FIGURE 2 is a view in cross-section taken along the plane 2-2 of FIGURE 1, looking in the direction of the arrows;

FIGURE 3 is an isometric view of the backpack; and

FIGURE 4 is a view of the backpack mounted on the back of an underwater swimmer.

The backpack of the present invention, in its preferred form, is a one-piece, contoured, substantially sheet-like rigid frame or shell having oppositely disposed wings 2 and 3 which extend laterally and somewhat forwardly. A receptacle 4 for receiving the base of an air tank, the

air tank being shown in phantom and designated by the reference character A, is formed as an integral part of the frame at the lower end thereof on the side opposite the back-engaging side of the frame. An open retaining collar 5 for receiving the upper neck of the air tank is formed as an integral part of the rigid frame at the upper end thereof. A clamp 6 encircles the retaining collar 5 and secures the upper end of the air tank to the backpack.

The backpack is mounted on the back of the carrier by a harness or strap 7. The strap is threaded through a pair of slots 8 and 9 formed in the lateral extension 2, then through a pair of slots 10 and 11 formed at the center of the frame above the lateral wings 2 and 3, and finally through a pair of slots 12 and 13 formed in the lateral wing 3. The lengths of the strap between the slots 9 and 10 and between the slots 11 and 12 serve as shoulder straps, and the free ends of the strap are buckled together around the waist. When the backpack is properly worn, it holds the air tank securely on the back of the carrier without side-to-side motion.

The backpack, in its preferred form, has a flat base 14 and is designed so that when an air tank is secured therein the backpack will be capable of standing in upright position on level ground. Since the frame is of one piece rigid construction, the retaining collar 5 is located in a predetermined fixed position with respect to the receptacle 4 to insure this result. Since the air tank is extremely heavy in comparison with the backpack, it is unnecessary that the backpack be designed to stand upright on the base 14 when the air cylinder is not secured therein. The important thing is that the backpack be designed to retain the air tank in upright position such that its center of gravity is directly above the center of the base 14.

For maximum convenience, the backpack is designed so that a substantial area of the back-engaging side thereof engages the back of the carrier, thereby distributing the load over a greater area of the back. In this connection, the shell distributes the weight of the load on the upper portion of the back beneath the collar bone, on both sides of the spine, and the laterally and forwardly extending wings 2 and 3 of the frame conform generally to the shape of the back of the carrier and provide back-engaging surfaces of substantial area which help distribute the load over a large area of the back, particularly the back of the wearer's rib carriage beneath the shoulder blades and the waist region.

In order to insure that the air cylinder is secured firmly in the backpack, the surface of the backpack opposite the back-engaging side is curved concavely as indicated by the reference numeral 15 so that the lower receptacle 4, upper retaining collar 5 and intermediate portion of the frame cooperate to define a receptacle shaped generally in complementary fashion to a part of the air tank to be accommodated therein. The base of the air tank fits snugly within the receptacle 4, and the neck of the air tank is secured against the collar-like formation, so that the receptacle and collar portions of the shell cooperate to hold the air tank against movement relative to the shell. The opposite or front surface of the rigid shell is convexly curved intermediate the wearer's shoulder blades, but it is somewhat recessed so that the engagement of the portions above and on opposite sides of the convexly curved portion with the wearer's back prevents contact between the convexly curved portion and the spine to afford maximum freedom of movement to the spine.

The backpack is preferably constructed of a strong, lightweight material capable of withstanding corrosion by sea water. Fiberglass or a fiberglass-epoxy resin composition are suitable materials, although obviously various metals and thermoplastic and thermosetting materials can also be used.

The invention of the present invention is described in a single preferred form and by way of example only, and obviously many variations and modifications may be made therein without departing from the spirit of the invention. The invention, therefore, is not intended to be limited to any specified form or embodiment, except insofar as such limitations are expressly set forth in the appended claims.

We claim:

1. A lightweight backpack for carrying an air tank comfortably, conveniently, and without side-to-side motion relative to the backpack comprising a one-piece contoured, substantially sheet-like shell including a longitudinal central portion, back-engaging surfaces on both sides of the longitudinal central portion on the side of the shell for engaging the wearer's back, laterally and forwardly extending wings intermediate the upper and lower ends of the shell and having surfaces which form continuations of the back-engaging surfaces for engagement with the wearer's back, and a contoured receptacle integrally formed at the lower end of the shell on the side opposite the back-engaging side for snugly receiving the base of an air tank therein comprising an upstanding base which permits the backpack to stand upright on the ground with an air tank accommodated therein when not in use.

2. A lightweight backpack for carrying an air tank comfortably, conveniently and without side-to-side or other motion relative to the backpack comprising a one-piece contoured, substantially sheet-like, rigid shell including a longitudinal central portion shaped concavely on one side to accommodate a cylindrical air tank, back-engaging surfaces on the opposite side of the shell at the upper end and adapted to extend downwardly on opposite sides of the wearer's spine, laterally and forwardly extending wings intermediate the upper and lower ends of the shell and having surfaces which form continuations of the back-engaging surfaces for engagement with the wearer's back in the region of the rib carriage and waist, a contoured receptacle integrally formed at the lower end of the shell on the side opposite the back-engaging surfaces for snugly receiving the base of an air tank therein, a contoured upper end defining an open collar-like formation for receiving the neck of an air tank therein, the collar-like formation and receptacle portions of the shell cooperating to hold an air tank against movement relative to the shell, means at the upper end of the shell and on the laterally and forwardly extending wings

for securing a harness to the shell, and clamp means for securing the neck of the air tank within and in engagement with the said collar-like formation.

3. A lightweight backpack for carrying an air tank comfortably, conveniently and without side-to-side or other motion relative to the backpack comprising a one-piece contoured, substantially sheet-like, rigid shell including a longitudinal central portion shaped concavely on one side to accommodate a cylindrical air tank, separate back engaging surfaces on the opposite side of the shell on the upper end and adapted to extend downwardly on opposite sides of the wearer's spine, laterally and forwardly extending wings intermediate the upper and lower ends of the shell having surfaces which form a continuation of the back-engaging surfaces for engagement with the wearer's back and a contoured receptacle integrally formed at the lower end of the shell on the side opposite the back-engaging side for snugly receiving the base of an air tank therein and comprising an upstanding base which permits the backpack to stand upright on the ground with an air tank accommodated therein when not in use.

4. A lightweight backpack for carrying an air tank comfortably, conveniently, and without side-to-side motion relative to the backpack comprising a one-piece contoured, substantially sheet-like shell including a longitudinal central portion, back-engaging surfaces on both sides of the longitudinal central portion on the side of the shell for engaging the wearer's back, laterally and forwardly extending wings intermediate the upper and lower ends of the shell and having surfaces which form continuations of the back-engaging surfaces for engagement with the wearer's back, a contoured receptacle integrally formed at the lower end of the shell on the side opposite the back-engaging side for snugly receiving the base of an air tank therein, means at the upper end of the shell and on the laterally and forwardly extending wings for securing a harness to the shell, and means for clamping the upper end of the air tank to the upper end of the shell.

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