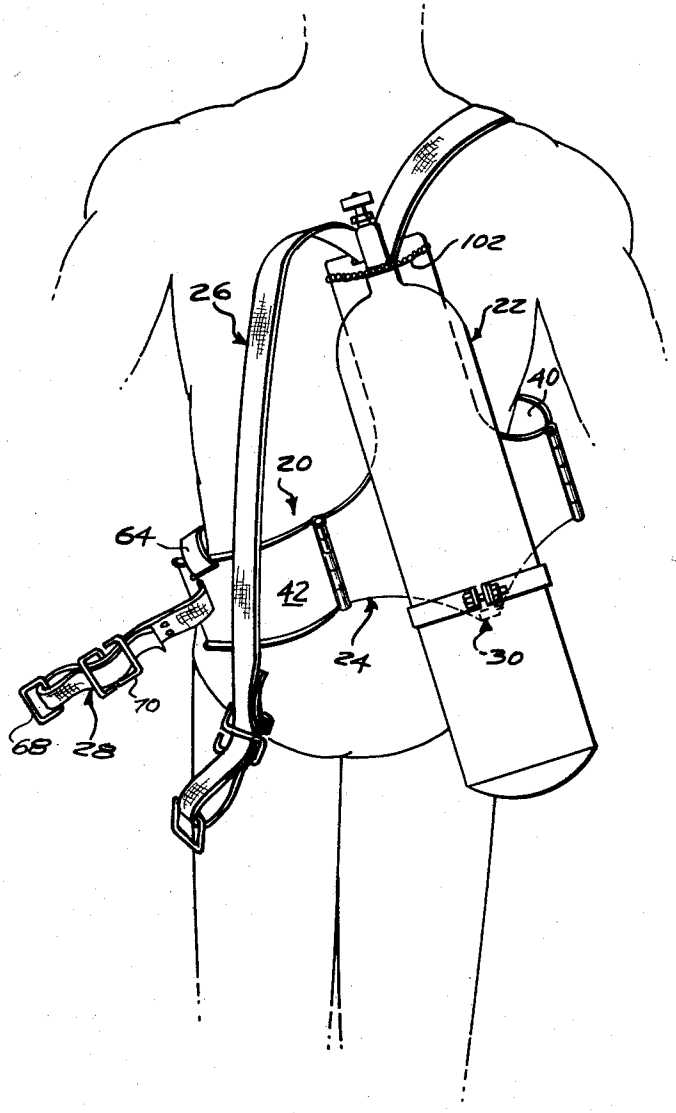
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SKIN DIVING HARNESS CONSTRUCTION

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FIG. 1



Irving W. Lande
Inventor
by Morse & Altman
Attorneys

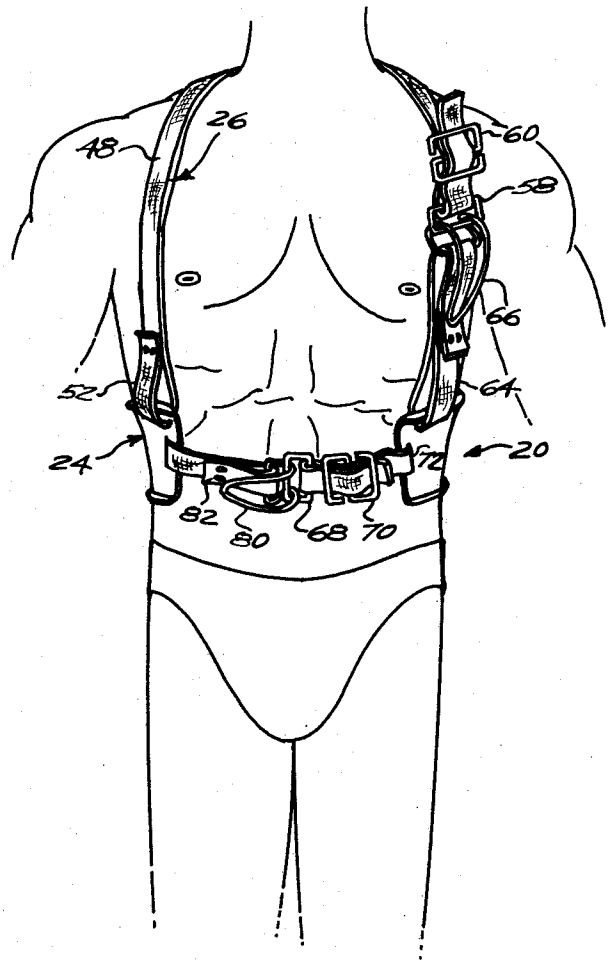
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SKIN DIVING HARNESS CONSTRUCTION

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FIG. 2



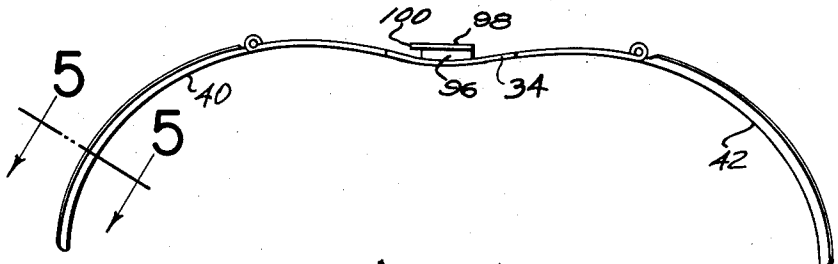
Irving W. Lande
Inventor
by Morse & Altman
Attorneys

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FIG. 3



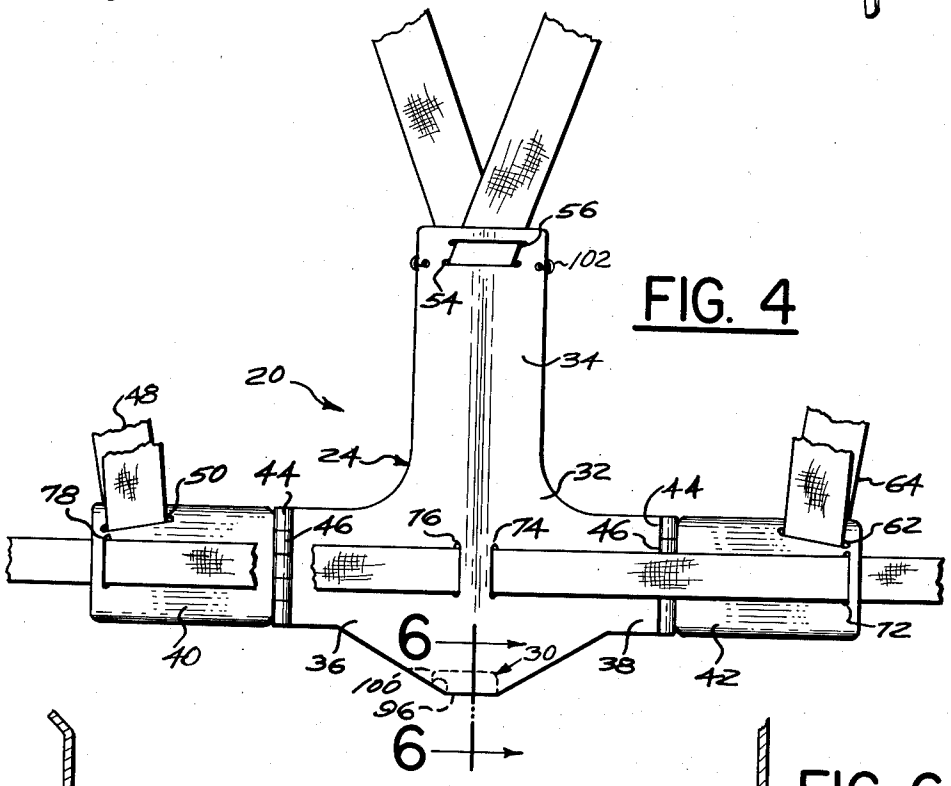
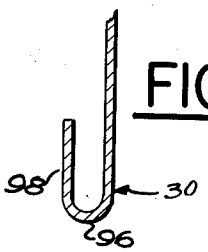


FIG. 4

FIG. 5



FIG. 6



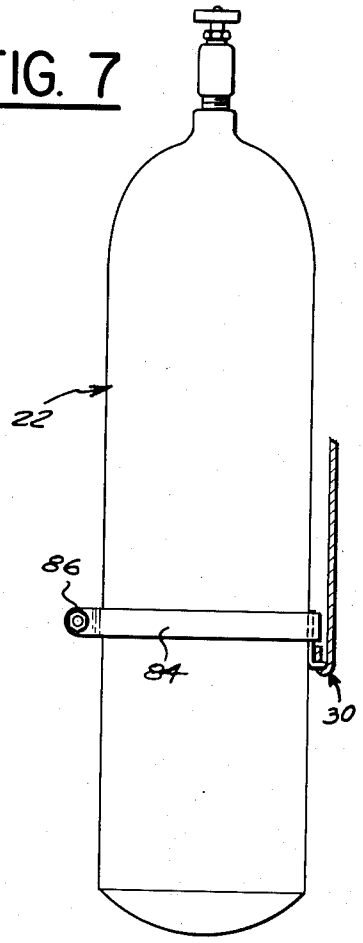
Irving W. Lande
Inventor
by Morsel & Altman
Attorneys

Nov. 27, 1962 I. W. LANDE 3,065,888

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FIG. 7



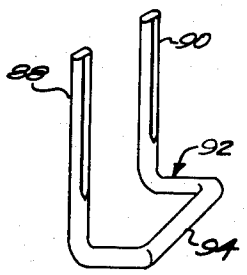


FIG. 8

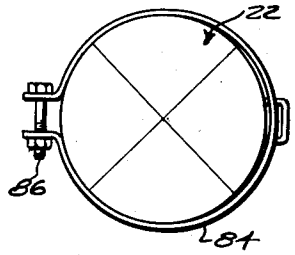


FIG. 9

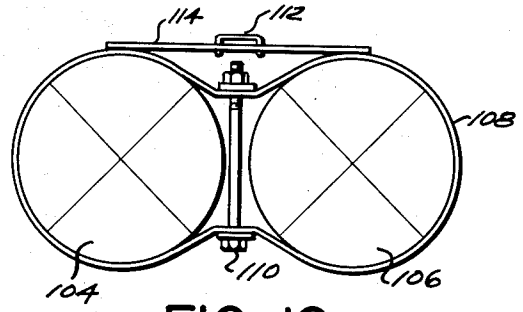
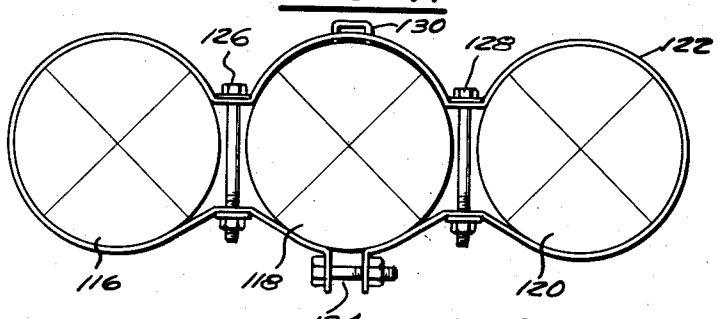


FIG. 10

FIG. 11



Irving W. Lande
Inventor
by Morse & Altman
Attorneys

Nov. 27, 1962 I. W. LANDE 3,065,888

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FIG. 12

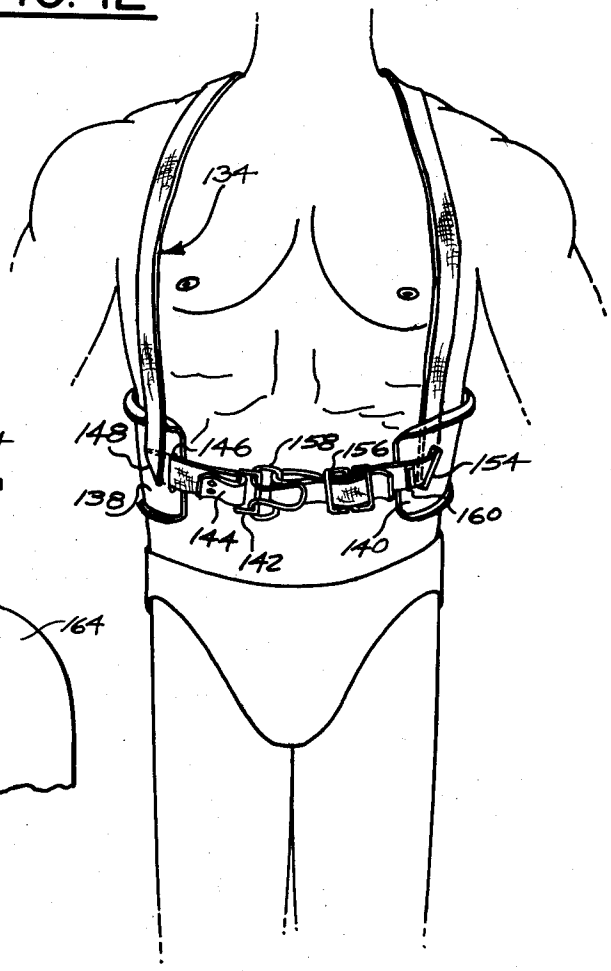


FIG. 13

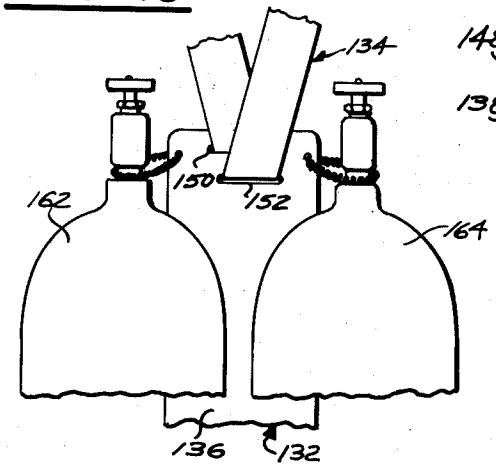
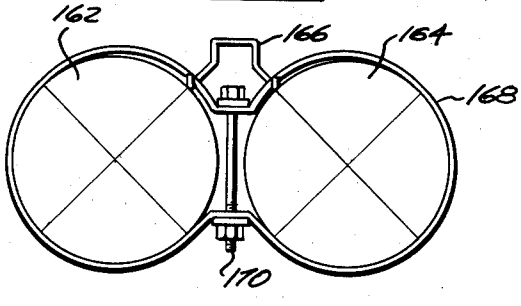


FIG. 14



Irving W. Lande
Inventor
by Morse & Altman
Attorneys

United States Patent Office

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Patented Nov. 27, 1962

3,065,888

SKIN DIVING HARNESS CONSTRUCTION

Irving W. Lande, 52 Grove Hill Ave., Newton, Mass

Filed Mar. 2, 1959, Ser. No. 796,371
3 Claims. (Cl. 224—5)

The present invention relates to skin diving and, more particularly, to a novel harness for enabling a diver with breathing apparatus to carry a supply of air therefor. Such a harness should be easy to put on and to carry out of the water for convenience, rapidly removable in the water for safety, comfortable in use so as not to interfere with bodily movement, readily adjustable to different body sizes and versatile for the purpose of carrying tanks of varying size or number.

The primary object of the present invention is to provide a harness of the foregoing type comprising, in novel association; a frame component including a medial portion to be held against the back of a wearer and a pair of hinged wing portions to be held against the sides of a wearer; shoulder belting extending from one of the wing portions over one shoulder to the medial portion and over the other shoulder to the other of the wing portions; waist belting extending around the waist from one of the wing portions, to the medial portion and to the other of the wing portions. The shoulder belting is adjustably connected to the central portion by slots which provide sufficient freedom to enable the diver to put on the harness himself without help. The waist belting is designed to hug the waist at spaced positions along its periphery in order to obviate any necessity for crotch straps of the type that have been used to prevent wobbling and sliding in relation to the diver's body. The center portion of the frame is provided with a hook and a resilient connector by which one or more tanks may be securely but readily connected to the frame and exchanged for a fresh tank quickly, even underwater.

Other objects of the present invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the product possessing the features, properties, and relation of components, which are exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the appended claims.

For a fuller understanding of the nature and objects of the present invention, reference should be had to the following detailed description taken in connection with the accompanying drawing wherein:

FIG. 1 is a rear perspective view of a harness, embodying the present invention, as it would appear when carried out of the water on one shoulder of a diver;

FIG. 2 is a front perspective view of the harness of FIG. 1, as it would appear when worn in the water;

FIG. 3 is a top view of a component of the harness of FIG. 1;

FIG. 4 is an inside front view of portions of the harness of FIG. 1;

FIG. 5 is a sectional view of FIG. 3, taken substantially along the line 5—5;

FIG. 6 is a sectional view of FIG. 4, taken substantially along the line 6—6;

FIG. 7 is a side view, showing fragments of the harness of FIG. 1;

FIG. 8 is a perspective view of one of the elements shown in FIG. 7;

FIG. 9 is a fragmentary top view of FIG. 7, illustrating details thereof;

FIG. 10 is a fragmentary top view of a multi-tank arrangement analogous to the single tank arrangement of FIG. 9;

FIG. 11 is a fragmentary top view of anther multi-tank arrangement analogous to the single tank arrangement of FIG. 9;

FIG. 12 is a front perspective view of an alternative harness of the present invention, as it would appear when worn in the water;

FIG. 13 is a detail view of a fragment of the harness of FIG. 12; and

FIG. 14 is a detail view of another fragment of the harness of FIG. 12.

Generally, the embodiment of the present invention illustrated in FIGS. 1 through 9 is a harness **20** to be worn upon the body of the skin diver for the purpose of enabling the skin diver to carry one or more tanks **22** of air, as shown in FIGS. 1, 2 and 7. Harness **20** comprises a frame **24** to be substantially in contact with the back and waist of the diver, shoulder belting **26** to engage the shoulders of the diver and to fix certain portions of harness **24** with respect thereto, waist belting **28** to engage the waist of the diver and to fix other portions of frame **24** with respect thereto, and connecting elements by which tank **22** may be secured to frame **24**.

Frame **24** (FIG. 4) includes a medial yoke **32** including a vertical longitudinal section **34** and a pair of oppositely directed transverse sections **36** and **38**. Oppositely extending from transverse sections **36** and **38** are a pair of wings **40** and **42**. Wings **40** and **42** are pivoted to transverse sections **36** and **38** by interacting hinge elements **44** and **46**, which are integral with their respective transverse sections and wings and are aligned by suitable pins (not shown). Wings **40** and **42** taper outwardly in the upward direction to accommodate the rib-cage of the wearer.

Shoulder belting **26** (FIGS. 2 and 4) includes a first portion **48** that is connected at one end to a slot **50** in wing **40** by a loop **52**, that is threaded through a pair of offset slots **54** and **56** in longitudinal section **34** of yoke **32**, and that extends over the other shoulder through an S-shaped locking clip **60** to a rectangular fastening ring **58**. Shoulder belting **26** includes a second portion that is connected to wing **42** through a slot **62** by a loop **64** and to a cam buckle **66**, which may be attached to or detached from loop **58**, conveniently.

Waist belting **28** extends from a fastening ring **68** through an S-shaped locking clip **70**, a slot **72** in wing **42**, a pair of slots **74** and **76** in yoke **32**, a slot **78** in wing **40** and to a cam buckle **80** to which it is connected by a loop **82**.

As shown in FIG. 7, tank **22** is provided medially with a strap **84**, the opposite extremities of which are tied by a nut and bolt assembly **86**. Strap **84** grips the upstanding arms **88** and **90** of a fastener **92** that is provided with a bight **94**. Bight **94** operates in a manner now to be described.

The lower extremity of longitudinal section **34** of yoke **32** is provided integrally with a hook element **30**. Hook element **30** includes (FIG. 3) a rearwardly extending intermediate section **96**, an upwardly extending reverse section **98** and a transversely projecting extension section **100**. Hook element **30** is designed for locking insertion into the region between bight **94** of fastener **92** and tank **22**. When tank **22** is in upright orientation with respect to longitudinal section **34**, with hook **30** in engagement with fastener **92**, a helical spring **102**, which engages the neck of tank **22** and is connected at its opposite ends to longitudinal section **34**, is capable of maintaining tank **22** in predetermined orientation with respect to yoke **32**.

In practice the diver can put on this harness easily himself even when wearing a diving suit with full equipment. When putting the harness on, the diver picks up the harness by shoulder portion strap **48** and drops it upon one shoulder. The length of this portion may be

adjusted by forcing increments of this portion through slots **54** and **56**. When so adjusted, this portion will not slip because of the positioning of slots **54** and **56** with respect to the shoulders. Thereafter, ring **58** is secured to cam buckle **66**. Similarly, fastening ring **70** is attached to cam buckle **80**. It is apparent that shoulder belting **26** may be adjusted by S-shaped locking clip **60** and that waist belting **28** may be adjusted by S-shaped locking clip **70**. The detachability of fastening ring **58** and cam buckle **66** avoids any necessity of shrugging a free elbow and shoulder into a tight shoulder strap. By virtue of hook **30**, tank **22** may be secured to frame **24** with ease. In the water, rigidity of frame **24** prevents wobble and the points of contact provided by the shoulder belting **26** and waist belting **28** prevent any substantial movement of tank **22** from its intended position.

FIGS. 10 and 11 illustrate multiple tank arrangements designed in accordance with the present invention. In FIG. 10, two tanks **104** and **106** are held together by the band **108**, which is tightened between the tanks by a nut and bolt arrangement **110** and which is provided with a hook **112**. Hook **112** is similar to hook **92** of FIG. 8 and is carried by a cross piece **114** that is affixed at its opposite ends to band **108**. In FIG. 11, three tanks **116**, **118** and **120** are held together by a band **122** that is tightened at its opposite extremities by a nut and a bolt arrangement **124**, as well as by nut and bolt arrangements **126** and **128** between adjacent tanks. A hook **130**, analogous in all respects to hook **92** of FIG. 8, is gripped between band **122** and the center tank **118**.

In an alternative embodiment of the present invention as shown in FIGS. 12, 13 and 14, a frame **132**, analogous in all respects to frame **24** of FIG. 4, is associated with shoulder and waist belting **134** of novel construction. As shown, frame **132** includes a yoke **136**, analogous to yoke **32** of FIG. 4, and a pair of wings **138** and **140**, analogous to wings **40** and **42** of FIG. 4. Belting **134** extends from a fastening clip **142**, to which it is connected by a loop **144**, through a pair of slots **146** and **148** in wing **138**, over one shoulder to a pair of offset slots **150** and **152**, over the other shoulder through a slot **154** in wing **140**, through an S-shaped adjusting clip **156** and to a locking cam **158**. Slots **146** and **148** are disposed at an angle of substantially 45° with respect to each other in order to permit adjustment but to prevent slippage. Slot **154**, which is relatively wide compared to slots **146** and **148**, is at an angle of approximately 45° with respect to the horizontal. Slot **154** permits free slippage therethrough. A stop **160** is provided between slot **154** and adjusting clip **156** for the purpose of limiting the slippage through slot **154** when cam buckle **158** and fastening clip **142** are disengaged.

In practice, the diver first may lift the harness to one shoulder by means of the securely fastened portion of belting **134**, next may readily insert his other shoulder through the remainder of the belting and then may tighten the remainder of the belting upon the latter shoulder and around the waist by attaching cam buckle **158** to fastening clip **142**.

As shown in FIGS. 13 and 14, a pair of tanks **162** and **164**, which may be carried by frame **132**, may be provided with a hook element **166** generally similar to hook element **92** above, except for an outwardly splayed arrangement of its upstanding arms. These arms are gripped between strap **168** and tanks **162** and **164** by virtue of the tension generated by a nut and bolt assembly **170**.

Since certain changes may be made in the above product without departing from the scope of the invention herein involved, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted in an illustrative and not in a limiting sense.

I claim:

1. A harness for mounting an air supply upon the body of a skin diver, said harness comprising a frame including a yoke portion and a pair of wing portions pivoted thereto, and belting including waist portions extending through slots in said wing portions, a pair of shoulder portions extending through slots in said wing portions and slots in said yoke portion, and quick release means for said belting, one of said shoulder portions being adjustably fixed and the other of said shoulder portions being at least partially released when said quick release means is opened, an air supply in the form of at least one tank being connected to said harness, a loop fastened to one portion of said tank, a hook integral with said frame and including an intermediate section, a reverse section and a projection section in engagement with said loop, and a resilient connector connected to said yoke portion around another portion of said tank.

2. A harness for mounting an air supply upon the body of a skin diver, said harness comprising a frame including a yoke portion and a pair of wing portions pivoted thereto, and belting including waist portions extending through slots in said wing portions, and a pair of shoulder portions extending through slots in said wing portions and slots in said yoke portion, a quick release means for one of said waist portions and a quick release means for one of said shoulder portions, the other of said shoulder portions being adjustably fixed, an air supply in the form of at least one tank being connected to said harness, a loop fastened to one portion of said tank, a hook integral with said frame and including an intermediate section, a reverse section and a projection section in engagement with said loop, and a resilient connector connected to said yoke portion around another portion of said tank.

3. A harness for mounting an air supply upon the body of a skin diver, said harness comprising a frame including a yoke portion and a pair of wing portions pivoted thereto, and belting including waist portions extending through slots in said wing portions, a pair of shoulder portions extending through slots in said wing portions and slots in said yoke portion, and quick release means for said belting, one of said shoulder portions being adjustably fixed and the other of said shoulder portions being at least partially released when said quick release means is opened, and at least one tank connected to said harness, whereby when said release means is opened, said harness and said tank may be readily freed from said body, said harness further having a loop fastened to one portion of said tank, a hook integral with said frame and including an intermediate section, a reverse section and a projection section in engagement with said loop, and a resilient connector connected to said yoke portion around another portion of said tank.

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