

April 13, 1954

J. D. ACKERMAN

2,675,150

PACK HARNESS FOR COMPRESSED GAS CYLINDERS

Filed Dec. 12, 1952

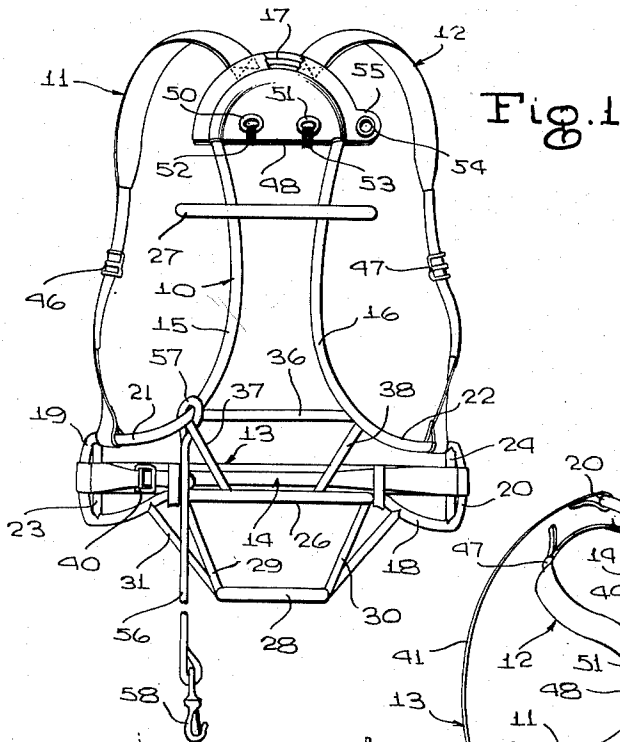


Fig. 1

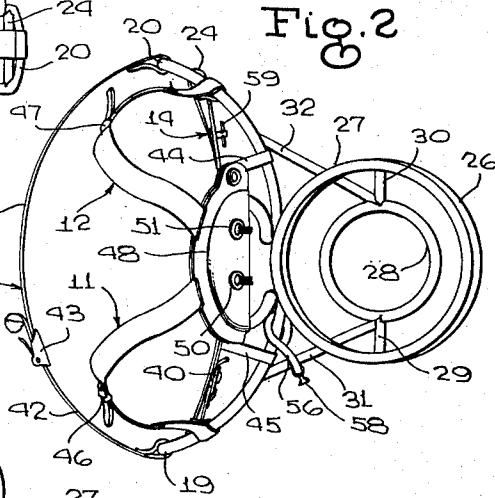


Fig. 2

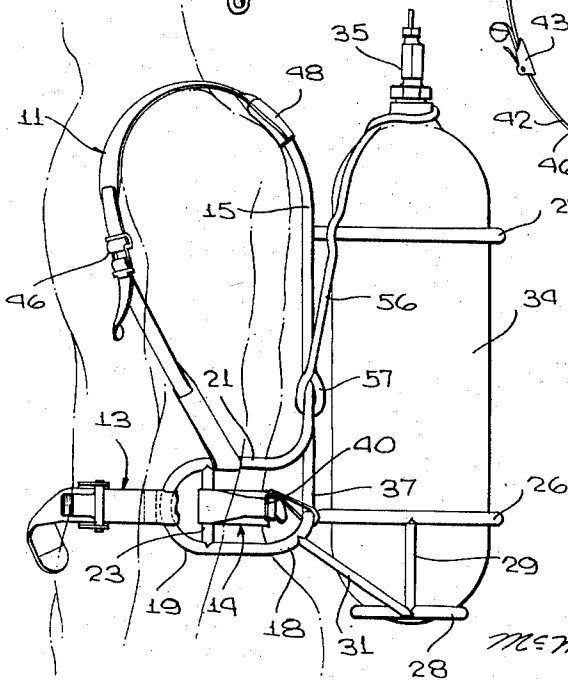


Fig. 3

INVENTOR.
JOHN D. ACKERMAN
BY

McMorrow, Burman & Davidson
ATTORNEYS

UNITED STATES PATENT OFFICE

2,675,150

PACK HARNESS FOR COMPRESSED GAS CYLINDERS

John Douglas Ackerman, Honolulu, Oahu,
Territory of Hawaii

Application December 12, 1952, Serial No. 325,657

2 Claims. (Cl. 224-5)

1

This invention relates to pack harnesses for carrying rigid and relatively heavy objects and more particularly to a pack harness for human transportation of compressed gas cylinders or bottles containing compressed fluid such as air or oxygen for breathing under water or in rare or smoke filled air, fire extinguishing fluid, insecticide fluid or flame thrower or torch fuel.

It is among the objects of the invention to provide an improved pack harness for personal transportation of compressed fluid cylinders or bottles which is comfortable to wear and transfers the weight of the associated cylinder directly to the hips and legs of the wearer, relieving the wearer's back from strain and leaving his hands and arms completely free for use; which firmly supports the associated cylinder in upright position adjacent the back of the wearer and holds the cylinder against accidental release; which includes means for quickly releasing the cylinder from the harness in case of emergency; which firmly engages the wearer's body against objectionable looseness and undesirable distribution of weight; which includes a rigid frame portion firmly engaging the cylinder and applying the weight of the cylinder in a predetermined manner to the upper portion of the wearer's body; and which is simple and durable in construction, economical to manufacture, and effective and efficient in use.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawing, wherein:

Figure 1 is a rear elevational view of a pack harness illustrative of the invention;

Figure 2 is a top plan view of the harness illustrated in Figure 1; and

Figure 3 is a side elevational view of the harness shown in operative position on a wearer's body and carrying a compressed gas cylinder.

With continued reference to the drawings, the harness comprises a substantially rigid frame structure, generally indicated at 10, shoulder straps as indicated at 11 and 12 connected to the frame structure and waist straps generally indicated at 13 and 14 which together with the shoulder straps secure the frame on the upper portion of the body of a person wearing the harness.

The frame 10 is somewhat in the form of an inverted T and is formed of suitable substantially rigid material, such as small size aluminum or brass tubing. It has a stem portion including two lengths 15 and 16 of tubing longitudinally

2

curved and disposed in spaced apart, convexly opposed relationship to each other. The tubing lengths 15 and 16 are joined at the end of the stem portion of the frame remote from the cross portion thereof by an arcuately curved length 17 of the tubing and the stem portion is adapted to extend along the back of the wearer of the harness from a location just below the wearer's neck to a location somewhat above the hips. The cross portion of the T-shaped frame includes an arcuately curved length 18 of the tubing longitudinally curved to fit around the wearer's hips immediately below his waist and longitudinally curved end portions 19 and 20 which join the ends of the tubing length 18 to the adjacent ends of the corresponding lengths 15 and 16 of the stem portion of the frame. Adjacent the cross portion of the frame the tubing lengths 15 and 17 constituting the stem portion are curved outwardly and extended to meet the ends of the cross portion length 18 and have portions, as indicated at 21 and 22 substantially parallel to the adjacent end portions of the tubing length 18 so that they also constitute parts of the cross portion of the frame.

Struts 23 and 24 extend between and are secured to the tubing length 18 and the portions 21 and 22 of the tubing lengths 15 and 16 adjacent the end portions 19 and 20 of the cross portion of the frame and the adjustable strap 14 extends around and between these struts and is adapted to rest on the wearer's body at the juncture of the hips and back of the wearer, as illustrated in Figure 3, to transfer the weight of the cylinder carried by the harness directly to the hips and legs of the wearer.

A first cylinder-receiving ring 26 is peripherally secured to the tubing length 18 constituting the bottom of the cross portion of the inverted T-shaped frame and projects outwardly from the frame substantially perpendicular to a plane which includes the center lines of the tubing lengths 15 and 16 constituting the stem portion of the frame and a second cylinder-receiving ring 27 is peripherally secured to the tubing lengths 15 and 16 above the ring 26 but below the top portion 17 of the frame and projects outwardly from the frame substantially parallel to and in alignment with the ring 26. A third ring 28 is disposed below and substantially parallel to the ring 26 and is secured to this ring by struts 29 and 30 located at diametrically opposite positions around the two rings and is secured to the element 18 of the frame by brace struts 31 and 32. The rings 26 and 27 have a

3

diameter such that they slidably receive the compressed gas cylinder 34 therein while the ring 28 has a diameter smaller than the diameter of the rings 26 and 27 so that it provides a seat for the spherically rounded bottom end of the cylinder. The space between the rings 26 and 27 is less than the length of the cylinder so that while the bottom end of the cylinder rests on the ring 26 the upper end extends above the upper ring 27 and the cylinder valve 35 is disposed above and entirely clear of the harness.

A brace 36 extends between and is secured to the members 15 and 16 above and substantially parallel to the frame member 19 and downwardly converging braces 37 and 38 extend from the members 15 and 16 near the respectively opposite ends of the member 36 to the member 19.

This provides a harness frame of light weight and substantially rigid construction which firmly supports the gas cylinder 34 on the back of the wearer of the harness and this frame is secured to the wearer by the shoulder straps 11 and 12 and the belt or waist straps 13 and 14.

The rear member of the belt strap assembly or the back strap 14 is doubled around the struts 23 and 24 and has its ends secured together by an adjustable fastening 40 so that the length of this strap can be adjusted to fit the harness to wearers of different sizes. The front portion of the belt strap assembly 13 comprises two straps 41 and 42 of which the strap 41 is secured at one end to the end portion 23 of the cross portion of the T-shaped frame and the strap 42 is secured at one end to the end portion 19 of the cross portion of the frame. The straps 41 and 42 are adjustably secured together at their free ends by a buckle 43 and loops 44 and 45 extend around the back strap 14 and the frame member 18 one at each side of the lower cylinder-receiving ring 26 to assist in transferring the weight of the harness and the cylinder supported thereby to the back strap.

The shoulder straps 11 and 12 are each secured at their upper ends to the intermediate top portion 17 of the stem portion of the T-shaped frame and the strap 11 is secured at its other end to the frame member 15 at a location adjacent the strut 23 while the shoulder strap 12 is secured at its other end to the frame member 16 at a location adjacent the strut 24. The shoulder strap 11 is provided in two pieces adjustably secured together by a fastener 43 and the shoulder strap 12 is also provided in two pieces adjustably secured together by a fastener 47. A pad 48 is secured on the stem portion of the T-shaped frame at the end of the stem portion remote from the cross portion of the frame and comprises two pieces of sheet material of substantially semi-circular shape disposed at respectively opposite sides of the frame members 15 and 16 and the intermediate portion 17 and secured together to cover this top portion of the harness frame. This pad is preferably formed of flexible material, such as leather or sheet rubber, and cushion material, such as expanded rubber, is preferably disposed between the two parts of the pad cover to cushion the upper end of the harness frame on the back of the wearer of the harness.

Eyelets 50 and 51 are provided in the pad 48 between the frame members 15 and 16 and receive wrappings 52 and 53 respectively which extend around the adjacent edge of the pad to hold the parts of the pad cover together and a third eyelet 54 is provided in an ear 55 extending out-

4

wardly from one side of the pad to receive one end of a line which may be used to connect equipment, such as a fish spear or camera to the harness when the harness is being worn by a diver.

An elastic cord 56 is connected at one end to the frame member 15 between the adjacent ends of the braces 36 and 37 by means of a loop 57 at the corresponding end of the cord and a snap hook 58 is connected to the other end of this elastic cord. When a cylinder has been properly placed in the rings 26 and 27 with its bottom end resting on the ring 28, the elastic cord 56 is wrapped about the neck of the cylinder in which the valve 35 is mounted and the snap hook is engaged with a ring 59 on the back strap 14 so that the elastic cord secures the cylinder in the rings. The snap hook can be disengaged from the ring 59, the cord 56 removed from the cylinder and the cylinder unloaded from the harness, this arrangement being quickly releasable in case of emergency to free the wearer of the harness for action without the load of the compressed gas cylinder.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment, is therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. A pack harness for carrying compressed gas cylinders comprising a substantially rigid frame of inverted T shape formed of lengths of longitudinally curved metal tubing disposed in end to end relationship and including a stem portion adapted to extend along the back of the wearer and a cross portion adapted to extend around the back of the wearer adjacent the wearer's waist, adjustable length shoulder straps connected each at one end to the end of the stem portion of said frame remote from the cross portion thereof and at its other end to said cross portion adjacent the corresponding end of the latter, an adjustable length back strap extending along said cross portion and connected thereto near the respectively opposite ends thereof and an adjustable length belt strap connected to said cross portion at the respectively opposite ends thereof, and means mounted on and projecting outwardly from said frame for supporting a compressed gas cylinder thereon, said means supporting said cylinder on said frame including a first cylinder-receiving ring secured to the cross portion of said frame, a second cylinder-receiving ring secured to the stem portion of said frame and disposed above and substantially parallel to said first ring, a third ring having a diameter less than said first and second rings disposed below said first ring and adapted to provide a seat for the bottom end of an associated gas cylinder, and brace means securing said third ring to the cross portion of said frame.

2. A pack harness for carrying compressed gas cylinders comprising a substantially rigid frame of inverted T shape formed of lengths of longitudinally curved metal tubing disposed in end to end relationship and including a stem portion adapted to extend along the back of the wearer and a cross portion adapted to extend around the back of the wearer adjacent

5

the wearer's waist, adjustable length shoulder straps connected each at one end to the end of the stem portion of said frame remote from the cross portion thereof and at its other end to said cross portion adjacent the corresponding end of the latter, an adjustable length back strap extending along said cross portion and connected thereto near the respectively opposite ends thereof and an adjustable length belt strap connected to said cross portion at the respectively opposite ends thereof, means mounted on and projecting outwardly from said frame for supporting a compressed gas cylinder thereon, said means supporting said cylinder on said frame including a first cylinder-receiving ring secured to the cross portion of said frame, a second cylinder-receiving ring secured to the stem portion of said frame and disposed above and substantially parallel to said first ring, a third ring having a diameter less than said first and second rings disposed below

5

10

15

20

6

said first ring and adapted to provide a seat for the bottom end of an associated gas cylinder, and brace means securing said third ring to the cross portion of said frame, and an elastic cord secured at its ends to said frame and adapted to be wrapped around the neck of a gas cylinder mounted in said rings to hold the cylinder in the rings, the connection between at least one end of said cord and said frame being detachable for release of a gas cylinder from the rings.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,104,486	Johansen	Jan. 4, 1938
2,611,519	Utterstrom	Sept. 23, 1952

FOREIGN PATENTS

Number	Country	Date
511,767	Great Britain	Aug. 23, 1939