

[54] **EMERGENCY INFLATABLE
RECOMPRESSION UNIT**
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[51] Int. Cl. A61m 16/02
[58] Field of Search.....128/20 A, 1 B, DIG. 24,
128/298, 142 A, 28, 30

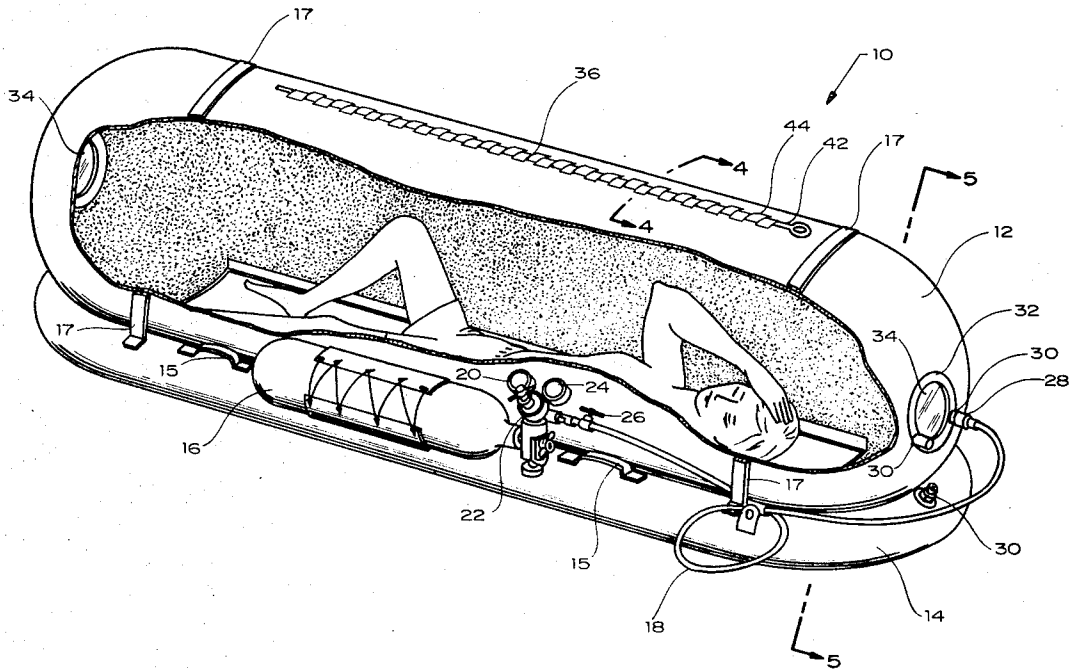
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[57] **ABSTRACT**
A portable recompression chamber comprising a flexible container constructed of a high-strength pressure-proof rubber-coated fabric which occupies a small space when collapsed and may be easily transported and inflated for use. Entrance to the chamber is through a long zippered opening.
6 Claims, 5 Drawing Figures



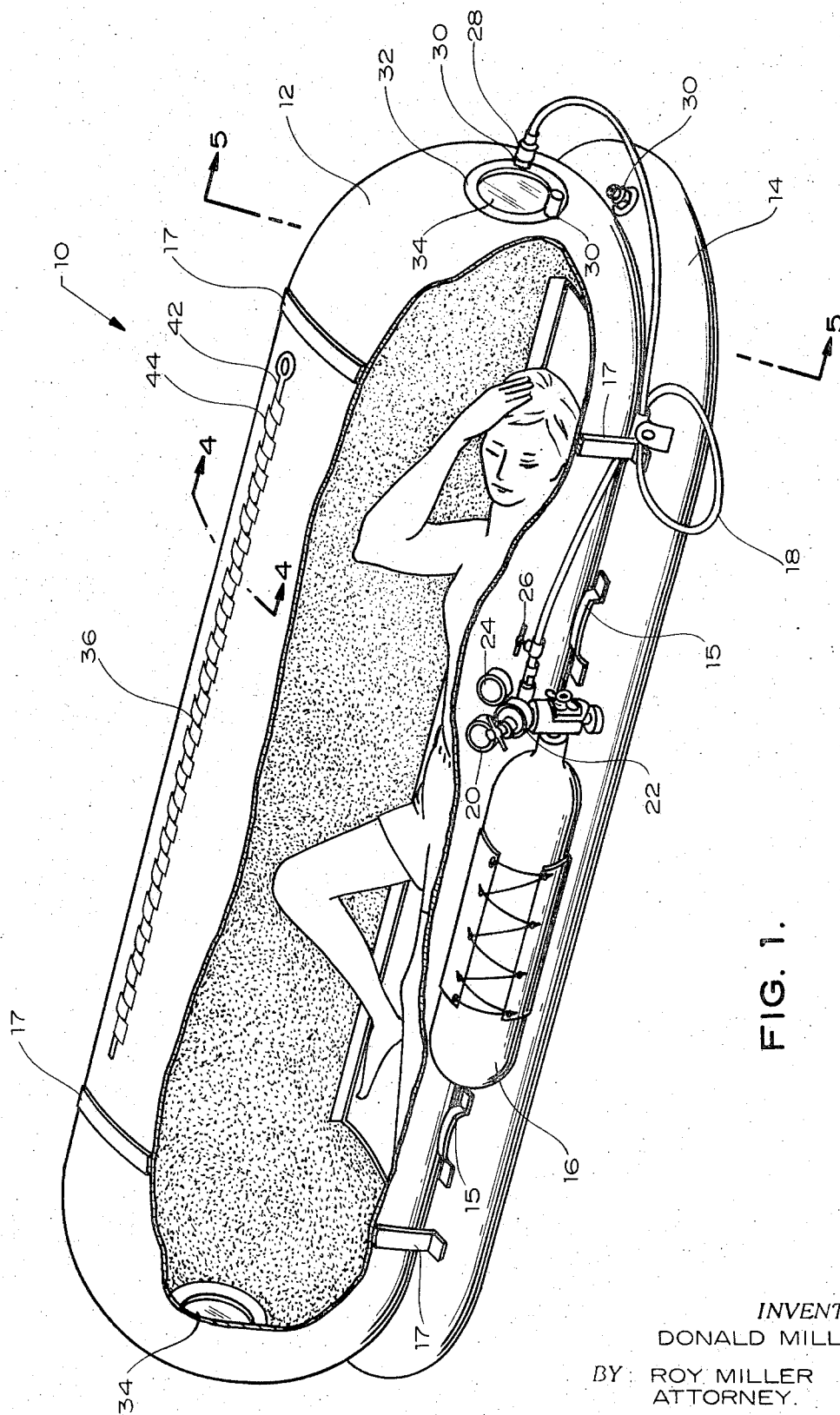


FIG. 1.

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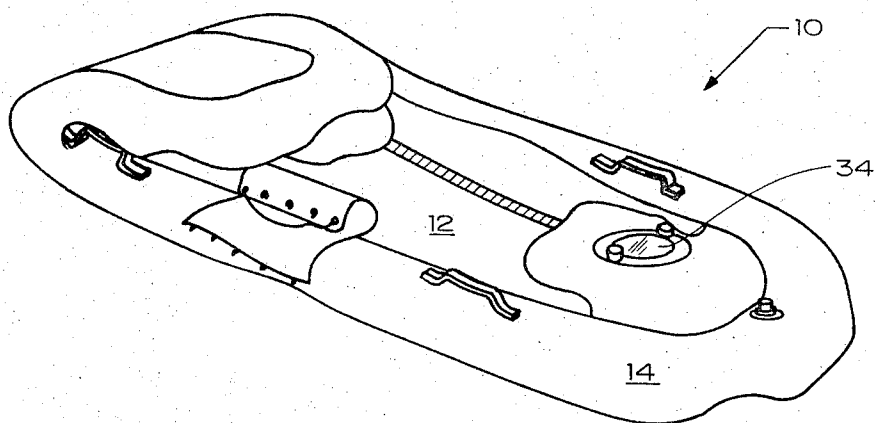


FIG. 2.

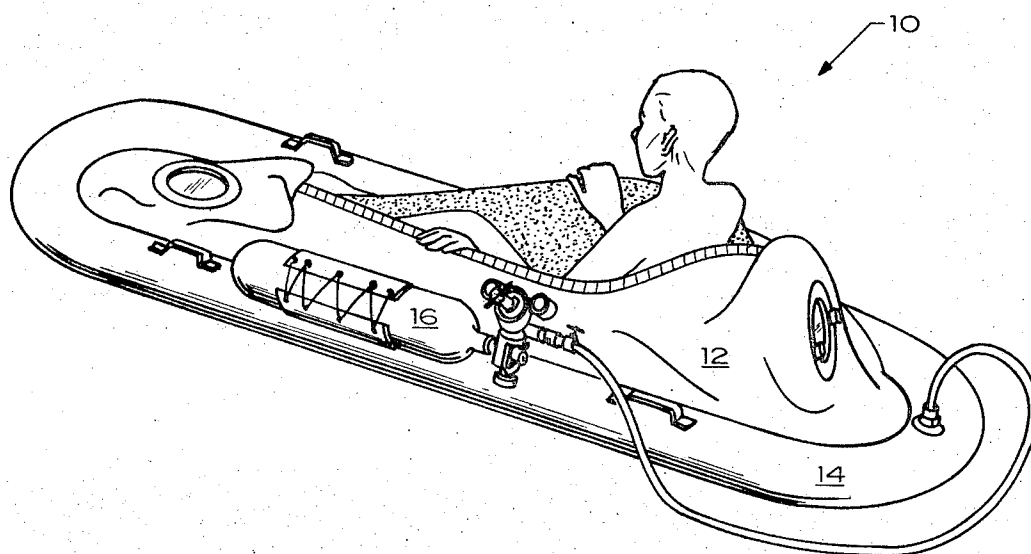


FIG. 3.

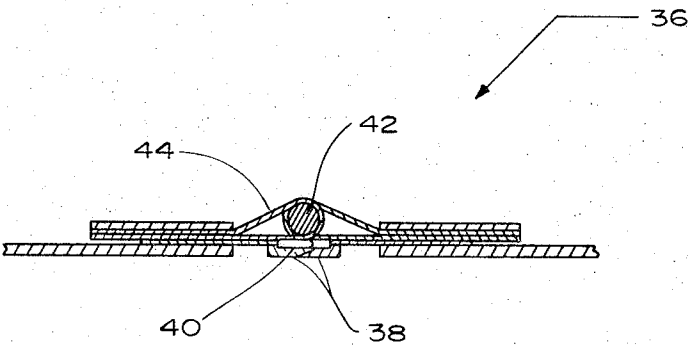


FIG. 4.

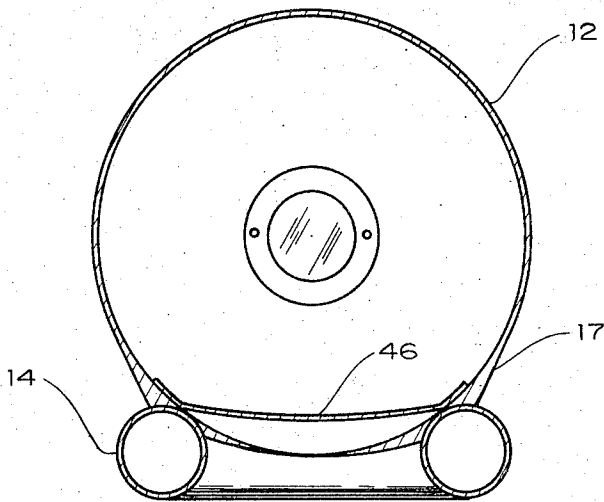


FIG. 5.

EMERGENCY INFLATABLE RECOMPRESSION UNIT

STATEMENT OF GOVERNMENT INTEREST

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

BACKGROUND OF THE INVENTION

In locations where much diving activity is in progress, it is usual to provide a recompression chamber with medical facilities and all other appurtenances necessary for the care of divers. These standard chambers are heavy and cumbersome as well as expensive, and many diving activities have too little diving to support their use. However, when a diver is incapacitated by a diving disease such as bends, air embolism, or spontaneous pneumothorax, it is necessary for him to have prompt treatment. In such cases it may be difficult, if not impossible, to provide such treatment early enough to secure the best results therefrom. Also, routine diving involves controlled decompression at times.

The present invention provides an improved recompression chamber suitable for the accommodations of one diver and having the essential elements necessary for minimum temporary care. The present invention is portable by virtue of its small size and collapsibility. While portable recompression chambers are available such as that shown in U. S. Pat. No. 2,448,546 to Plemel et al. dated 7 Sept. 1948, none are flexible and collapsible and therefore as portable as the present invention. Also, none of the available portable recompression chambers provide elongated entrance means for easy entrance into and out of the chamber.

SUMMARY OF THE INVENTION

The present types of recompression chambers are of a size, weight and cost which make it economically and physically impractical to have them available on the site of many diving operations. When a diver shows symptoms of a diving disease such as bends, air embolism or spontaneous pneumothorax, he must be transported to a permanent recompression station, if one is not available on the diving site. The period of time in transportation can be quite expensive, painful and dangerous for the stricken diver. The present invention is a high-strength pressure-proof rubber-coated device for transporting the victim under a desirable environmental pressure to a permanent recompression station and medical aid.

Due to the flexible and collapsible nature of the present invention, it possesses advantages over presently available recompression chambers in portability, size, weight and cost. Also, due to the extended length of the self-sealing entrance to the chamber, stricken divers may enter and exit the chamber with much greater ease than is true with prior art portable recompression chambers.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric view showing the invention fully inflated and in use;

FIG. 2 shows the invention in its deflated state;

FIG. 3 shows the invention with only the air mattress inflated;

FIG. 4 is cross section IV — IV of FIG. 1 showing the self-sealing pressure-proof zipper; and

FIG. 5 is cross section V — V of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The emergency inflatable recompression unit 10 is a flexible container constructed of a high-strength pressure-proof rubber-coated fabric. The unit 10 comprises two separately inflatable compartments. The larger of the two compartments is a recompression chamber 12 approximately 28-inches in diameter by 90-inches long. The smaller compartment is an air mattress 14 in the shape of an ovoid rubber raft which supports the recompression chamber. Attached to the air mattress 14 are handles 15 which are employed for manually lifting the air mattress and decompression chamber. The chamber 12 is attached to the air mattress 14 by any conventional manner such as by straps 17.

A pressurizing system used for inflating both compartments comprises a scuba tank 16 or any other well known air source connected to a high pressure gauge 20, a regulator 22, a low pressure gauge 24, a hand valve 26, a flexible hose 18 and a self-sealing quick disconnect coupling 28 respectively, all connected in series. A self-sealing quick disconnect nipple 30 is located in air mattress 14 and two self-sealing quick disconnect nipples 30 are located in manifold 32 of recompression chamber 12. One of the quick disconnect nipples 30 of the manifold 32 may be connected to the pressurization system, while the other is connected to a commercially available vent valve while provides air circulation. On each end of recompression chamber 12 is a plexiglass viewing port 34 for allowing observance of a person inside the recompression chamber.

The interior of recompression chamber 12 is made accessible through an opening at the top of the chamber. The opening is closable with a self-sealing pressure-proof zipper 36. Referring to FIG. 4, the chamber is sealed closed by sealing lips 38 after zipper 40 has been closed. The lateral stress on the zipper is reduced by inserting a metal rod 42 through a series of load loops 44 which pass over the top of the zipper.

Along the bottom of the interior of chamber 12 is a nylon mesh support 46 approximately attached to the sides of the chamber. When the chamber is inflated, the mesh support 46 is stretched to serve as a cushion for the stricken diver.

OPERATION

Upon discovering a diver with symptoms of one of the diving diseases, the emergency inflatable recompression unit 10 is removed from a carrying case and folded out on a level surface. The pressurizing system is then attached to one or more scuba tanks. The quick disconnect coupling 28 is then mated to the quick disconnect nipple 30 on the air mattress. The scuba tank valve is opened and the pressure regulator set for the pressure necessary to inflate the air mattress. The hand valve is then opened, allowing the air mattress to inflate. After the air mattress is inflated the quick disconnect is separated from the air mattress, the pres-

sure regulator is returned to zero pressure, the hand valve is closed and the quick disconnect coupling 28 is attached to a quick disconnect nipple 30 on manifold 32 of the recompression chamber. The pressure regulator is then set for 2 psi and the hand valve is opened. The stricken diver enters the recompression chamber, and the self-sealing zipper is closed. The relief valve is mounted on the manifold and set to the desired pressure for recompressing the stricken diver. The pressure regulator is then adjusted to provide the pressure needed to inflate the recompression chamber and to relieve the diver of discomfort. The unit is then transported with the diver into a permanent recompression chamber.

What is claimed is:

1. An emergency inflatable recompression unit comprising:

a flexible, collapsible recompression chamber;
a sealable opening in said chamber for allowing ingress and egress to said chamber; an integral ovoid shaped inflatable air mattress attached to the exterior bottom of said chamber;

pressurization means connected to said chamber for pressurizing said chamber and said inflatable air mattress including a pressure regulator, an air hose and a self-sealing quick disconnect coupling connected to said chamber and said mattress by self-sealing quick disconnect nipples on said chamber and said mattress; and handles attached to said

mattress to enable manual carrying of said chamber.

2. The unit of claim 1 wherein said sealable opening is closable with a slide fastener.

3. The unit of claim 1 wherein there is provided closure means for closing said sealable opening comprising:

a zipper running the length of said opening;
sealing lips running the length of said zipper on the interior of the chamber;
load loops running the length of said opening on the exterior side of the zipper; and
a metal rod insertable through said load loops.

4. The unit of claim 1 wherein said pressurization means comprises:

air supply means;
a high-pressure gauge, said pressure regulator, a low pressure gauge, a hand valve, said air hose and a self-sealing quick disconnect coupling respectively, being connected in series;
said high pressure gauge being directly connected to said air supply means.

5. The unit of claim 1 wherein said opening extends along the length of said chamber.

6. The unit of claim 1 wherein said pressurization means is connectable to said mattress for inflating said mattress.

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