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(54) **TACTICAL FLOTATION SUPPORT SYSTEM**

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(51) **Int. Cl.**
B63C 9/15 (2006.01)

(52) **U.S. Cl.** 441/92; 441/108

(58) **Field of Classification Search** 441/88, 441/80, 92, 108, 96; 405/185, 186
See application file for complete search history.

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(57) **ABSTRACT**

The flotation device includes an inflatable bladder, inflation means, activation means for the inflation means and is self-contained. Preferably, a plurality of flotation bladders which are inflatable by the user, a third party or automatically are used. A closure system prevents accidental inflation of the inflation means. The devices provides buoyancy to personnel and associated equipment.

16 Claims, 3 Drawing Sheets

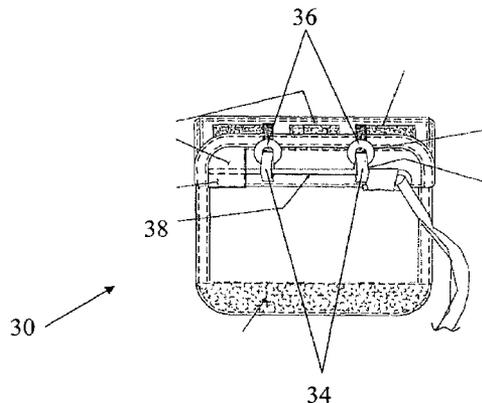
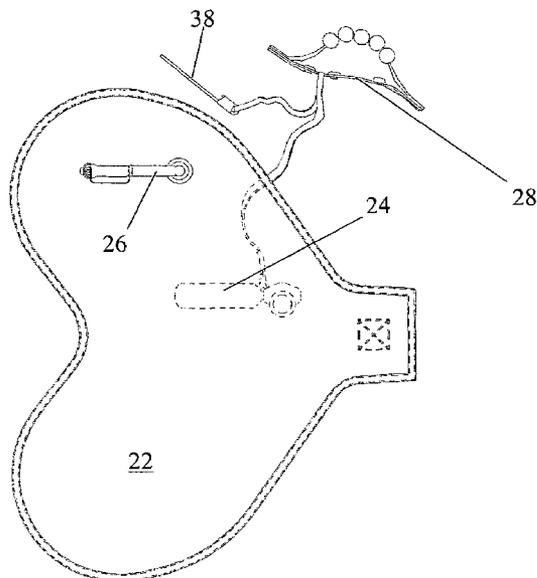




Figure 1

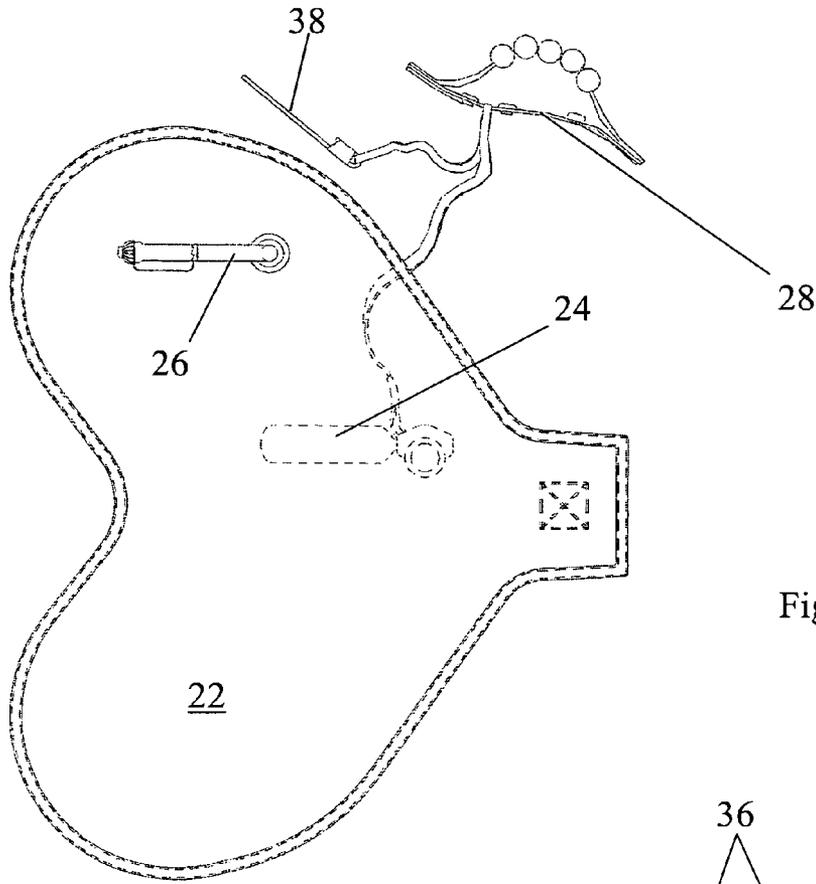


Figure 2a

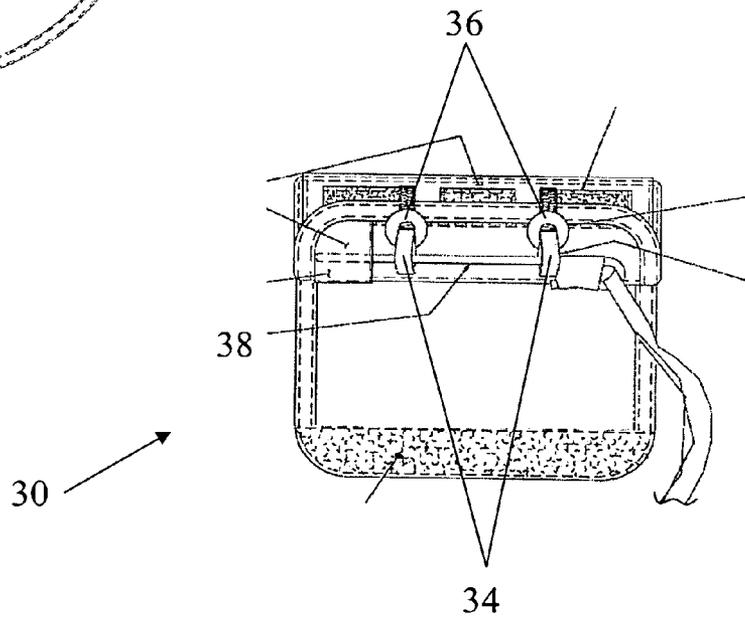


Figure 2b

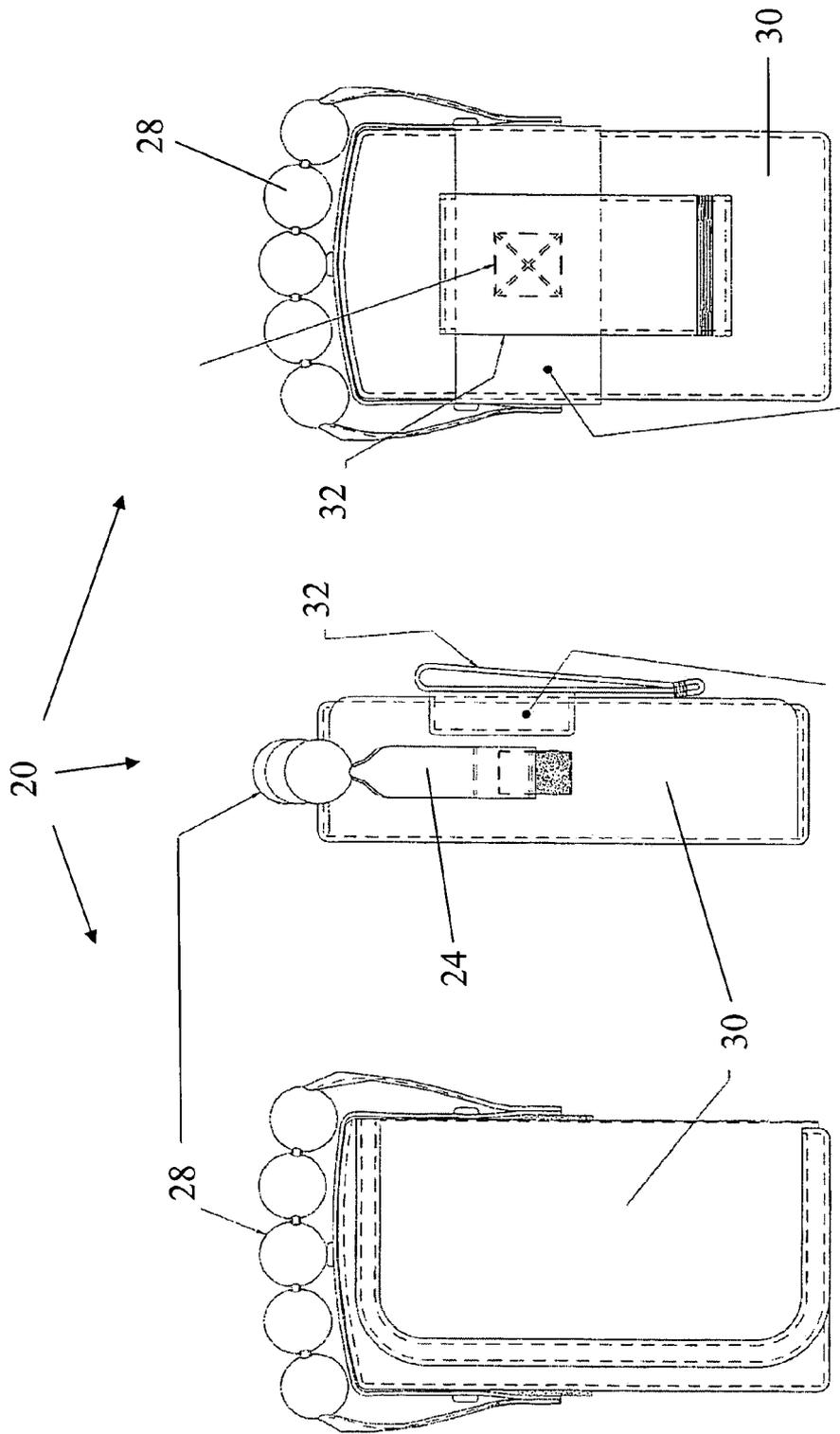


Figure 3c

Figure 3b

Figure 3a

TACTICAL FLOTATION SUPPORT SYSTEM**CROSS REFERENCE TO RELATED APPLICATIONS**

The present application claims priority from U.S. Provisional Application Ser. No. 60/524,061, filed Nov. 24, 2003.

BACKGROUND OF THE INVENTION**1. Field of the Invention**

The invention is generally related to buoyancy device. More particularly, the invention is directed to a high capacity buoyancy device capable of providing buoyancy to individuals and substantial amounts of equipment.

2. Description of Related Art

Buoyancy devices are well known in the prior art, particularly in the form of waist-mounted life belts or life preservers which are typically mounted around the wearer's neck and over their shoulders. These devices are inflated manually or by CO₂ cartridges and provide buoyancy for an individual.

Numerous life belts exist. For example, U.S. Pat. No. 6,394,866 describes a personal flotation device which is filled using a single gas cartridge and worn in a waist belt and inflated as needed. U.S. Pat. No. 6,231,411 describes a device for providing fashionable flotation support by placing air chambers into a belt for inflation and individual buoyancy. U.S. Pat. No. 6,179,677 shows a belt for use in water activities which has a manually inflatable bladder and at least one waterproof storage pocket are built. U.S. Pat. No. 6,106,348 describes a flotation device worn around a belt having a nozzle with a geometric design which overcomes the problems introduced by using a gas cartridge and the cold gas vented from the cartridge. U.S. Pat. No. 5,954,556 describes a flotation belt with multiple bladders which can be independently inflated by gas cartridges. The bladders are integral with the belt and remain around the wearer's waist. U.S. Pat. No. 5,839,932 describes a belt mounted water rescue device having pockets to hold different water rescue aids such as an inflatable belt, rescue tow line and other rescue tools as desired. The bladder can be inflated manually or by gas cartridges. Other examples of belt-type buoyancy devices are shown in U.S. Pat. No. 5,702,279; U.S. Pat. No. 5,466,179; U.S. Pat. No. 5,456,623; U.S. Pat. No. 5,453,033; U.S. Pat. No. 5,393,254; U.S. Pat. No. 5,382,184; U.S. Pat. No. 5,368,512; U.S. Pat. No. 5,022,879; U.S. Pat. No. 4,842,562; U.S. Pat. No. 4,379,705; U.S. Pat. No. 4,360,351; U.S. Pat. No. 2,452,475; and U.S. Pat. No. 1,833,614;

U.S. Pat. No. 6,676,467 describes an airbag for swimmers. The device is intended to provide flotation for an individual and is filled by the wearer manually, an electrical pump or compressed gas. The air bag is worn around the waist or chest, under a swimsuit.

U.S. Pat. No. 6,659,689 describes a complex flotation device which provides buoyancy and rescue assistance. This device is specifically designed to support a person and a 35 lb pack. It includes an inflatable neck collar and a front positioned inflatable element. The device may also include body armor, a releasable inflatable raft, and/or a second bladder. The bladder(s) may be inflated by gas cartridges or manually.

U.S. Pat. No. 4,560,356 describes a flotation system. The system is a container which includes an inflatable flotation device. Opening the top flap of the container causes activation of a gas cartridge, inflation of the device and release of the device from the container. The container is connected to

a wearer by a means such as a belt strap or the container can be connected to a boat or other water vehicle. In addition to the flotation device, the container may include water rescue devices such as an inflatable marker (also automatically inflated by opening the container flap) or other signal devices.

Therefore, there is need for a buoyancy device which is capable of providing buoyancy to individuals as well as the equipment they may need to carry, often substantial in weight. Further, there is a need for a compact, portable, lightweight, reusable device which includes redundant safety measures and which does not interfere with normal movement.

SUMMARY OF THE INVENTION

The present invention addresses these needs by providing a flotation device for a user or inanimate object. The device includes an air impermeable bladder constructed from a durable, water-resistant material such as welded nylon. The bladder is inflated by, preferably a compressed air cartridge and/or an oral inflation means. The bladder and inflation device is enclosed in a container. The container is also constructed from a water-resistant material such as nylon. The container is preferably closed by a loop, grommet and pin system. The pin is further preferably designed to actuate the compressed air cartridge such that releasing the pin simultaneously opens the container and actuates the compressed air cartridge. In the preferred embodiment, a handle releasably attached to the container actuates both the compressed air cartridge and release of the closure means. The handle can be attached to the container by hook and loop fastener, snaps or other easily released means. The container further includes an attachment device, such as a loop, for attaching the container to the user or inanimate object.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete description of the subject matter of the present invention and the advantages thereof, can be achieved by the reference to the following detailed description by which reference is made to the accompanying drawings in which:

FIG. 1 is a perspective view of the present invention in the open configuration;

FIG. 2a is a front view of the bladder portion of the preferred embodiment of the present invention in the open configuration;

FIG. 2b is a front view of the container portion of the preferred embodiment of the present invention;

FIG. 3a is a front view of the preferred embodiment of the present invention in the closed configuration;

FIG. 3b is a side view of the preferred embodiment of the present invention in the closed configuration; and

FIG. 3c is a rear view of the preferred embodiment of the present invention in the closed configuration.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The following detailed description is of the best presently contemplated modes of carrying out the invention. This description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating general principles of embodiments of the invention.

Referring to FIGS. 1 through 3, the preferred embodiment of a flotation device 20 in accordance with the present

invention is illustrated. Flotation device **20** consists of an inflatable bladder **22**, at least one inflation means **24,26**, activation means **28** for activating the inflation means, a container **30** and an attachment means **32** for attaching the device to a person and/or equipment.

The inflatable bladder **22** is made from a durable, air impermeable material which is preferably resistant to either fresh or salt water damage. In a particularly preferred embodiment, the bladder **22** is made from 200-denier nylon which is welded into the bladder shape.

The bladder **22** includes one or more inflation means **24,26**. Preferably, one inflation means is a 38 gram CO₂ cartridge **24** which can be activated by the wearer or by another person. The bladder **22** can also include a manual inflation means such as an oral inflation tube **26**. The inflation means **26** is preferably activated by means of a handle **28** which is releasably connected to a container **30** (described in detail below).

The bladder **22** and inflation means **24,26** are stored within a container **30**. The container **30** is made from a durable, water resistant material such as nylon. The container **30** is securely attached to the bladder **22**. In a particularly preferred embodiment, the container **30** is secured around the bladder **22** and inflation means **24,26** by means of loops **34** which are fed through grommets **36**. A pin **38** is extended through the loops **34** as they extend through the grommets **36**. In this particularly preferred embodiment, the pin **38** is connected to the handle **28** such that pulling the handle **28** to activate the CO₂ cartridge **24** simultaneously pulls the pin **38** to release the loops **34** from the grommets **36**, thus allowing the container **30** to open such that the bladder **22** can inflate.

The handle **28** is connected to the container **30** in a manner which allows for quick and easy removal. For example, snaps or hook and loop fastener can be used.

The flotation device **20** can be attached to the wearer or equipment by any satisfactory means. In a preferred embodiment, the container **30** includes a loop **32** through which a belt or other item can be threaded. If desired, the container **30** can be structurally strengthened at the attachment point for the loop **32**.

The preferred method of use by an individual is to secure two flotation devices **20**, preferably one on the left and one on the right. If needed for flotation, the handle **28** is grasped and pulled to simultaneously activate the CO₂ cartridge **24** and open the container **30**. Due to the easily accessible placement of the handle **28**, the handle **28** can be activated by a person not wearing the device to provide buoyancy for a person unable to activate the device himself or for an inanimate object. In the preferred orientation, one on either side of the wearer's body, this flotation device **20** does not interfere with normal activity, whether deployed or not. In its preferred embodiment, the flotation device **20** will raise 370 lbs from a depth of 33 feet in less than 10 seconds.

The flotation device is reusable by deflating the bladder **22** and replacing it into the container **30**. If necessary, the CO₂ cartridge **24** is replaced. The container **30** is then reclosed using the preferred loop **34** and grommet **36** system and secured with the pin **38**. The handle **28** is reattached to the container **30** resulting in a compact, easily transportable, lightweight, high capacity flotation device **20**.

Many improvements, modifications, and additions will be apparent to the skilled artisan without departing from the spirit and scope of the present invention as described herein and defined in the following claims.

What is claimed is:

1. A flotation device for a user or inanimate object, comprising:
 - an air impermeable bladder;
 - at least one inflation means for inflating the bladder;
 - a container attached to the bladder wherein the container is designed to hold the bladder and the at least one inflation means;
 - a closure means for closing the container, wherein the closure means comprises:
 - at least one loop;
 - at least one grommet through which the at least one loop may extend; and
 - a retaining means for temporarily retaining the at least one loop extended through the at least one grommet;
 - an actuation means for releasing the closure means; and
 - an attachment means for attaching the container to the user or inanimate object.
2. The device as set forth in claim 1 wherein the bladder is constructed from a durable, water-resistant material.
3. The device as set forth in claim 1 wherein the bladder is constructed from nylon.
4. The device as set forth in claim 1 wherein the bladder is constructed from welded nylon.
5. The device as set forth in claim 1 wherein the at least one inflation means is selected from the group consisting of a compressed air cartridge and an oral inflation unit.
6. The device as set forth in claim 1 wherein the at least one inflation means is a compressed air cartridge which is actuated by the actuation means.
7. The device as set forth in claim 1 wherein the container is constructed from a durable, water-resistant material.
8. The device as set forth in claim 1 wherein the container is constructed from nylon.
9. The device as set forth in claim 1 wherein the retaining means is a pin which is actuated by the actuation means.
10. The device as set forth in claim 1 wherein the actuation means is a handle.
11. A flotation device for a user or inanimate object, comprising:
 - an air impermeable bladder constructed from welded nylon;
 - a compressed air cartridge for inflating the bladder;
 - a container attached to the bladder wherein the container is designed to hold the bladder and the compressed air cartridge, the container further comprising:
 - a. at least one loop; and
 - b. at least one grommet through which the at least one loop may extend and be temporarily retained;
 - an actuation pin for releasing the loop from the grommet and for actuating the compressed air cartridge; and
 - an attachment means for attaching the container to the user or inanimate object.
12. The device as set forth in claim 11 further comprising an oral inflation unit for inflating the bladder.
13. A method for providing buoyancy to a user or inanimate object, comprising:
 - providing an air impermeable bladder, which bladder includes at least one inflation means;
 - securing the bladder to a container;
 - placing the bladder and the at least one inflation means within the container;
 - closing the container by means of a closure device, wherein the closure device comprises:
 - at least one loop;
 - at least one grommet through which the at least one loop may extend; and

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a retaining means for temporarily retaining the at least one loop extended through the at least one grommet; attaching the container to the user or inanimate object; and releasing the closure device to allow inflation of the bladder.

14. The method as set forth in claim **13** wherein the at least one inflation means is selected from the group consisting of a compressed air cartridge and an oral inflation unit.

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15. The method as set forth in claim **13** wherein the retaining means is a closure device pin which is actuated by the actuation means.

16. The method as set forth in claim **15** wherein the at least one inflation means is a compressed air cartridge which is actuated by releasing the closure device pin.

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