

April 23, 1968

P. M. CORNES

3,378,864

ATMOSPHERICALLY SELF-INFLATING BUOYANT DEVICE

Filed Feb. 18, 1966

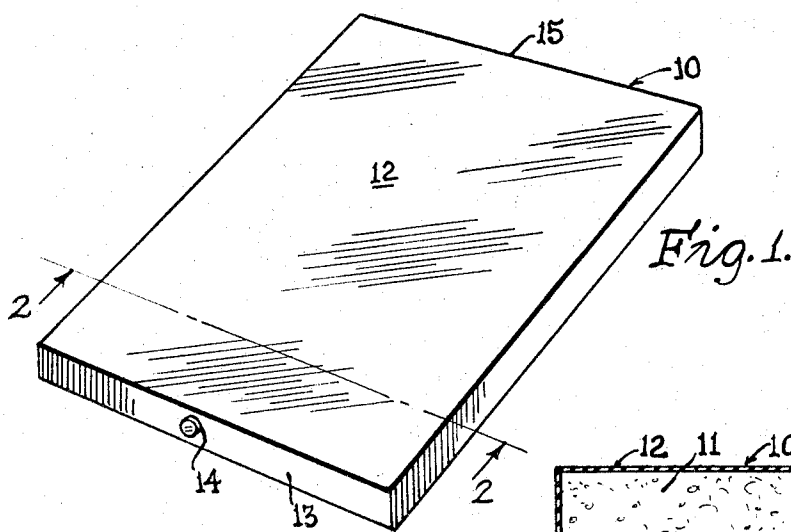


Fig. 1.

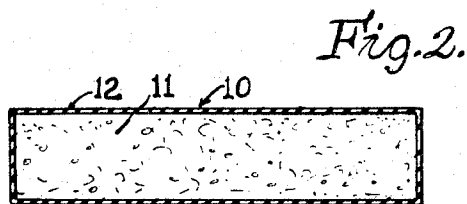


Fig. 2.

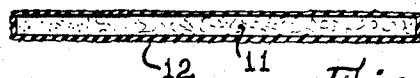


Fig. 3.

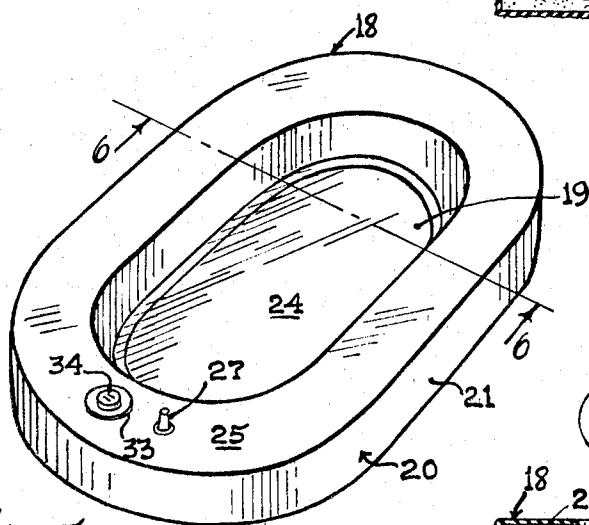


Fig. 5.

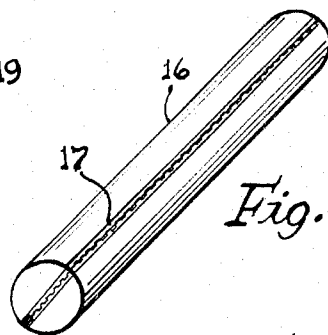


Fig. 4.

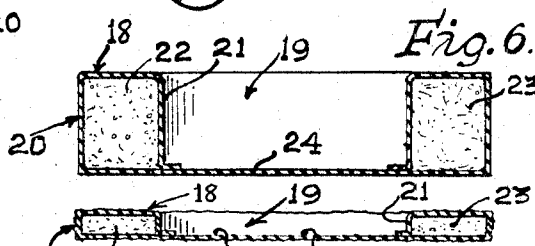


Fig. 6.

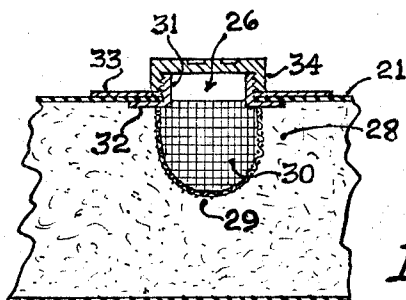


Fig. 8.

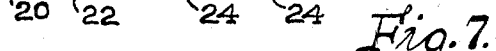


Fig. 7.

INVENTOR
PHIL M. CORNES
BY Edward C. Shively
HIS ATTORNEY

1

2

3,378,864

ATMOSPHERICALLY SELF-INFLATING BUOYANT DEVICE

Phil M. Cornes, 2108 Chestnut, Wilmette, Ill. 60091

Filed Feb. 18, 1966, Ser. No. 528,440

5 Claims. (Cl. 9—11)

ABSTRACT OF THE DISCLOSURE

A buoyant device that is self-inflating due to its surrounding atmospheric pressure and formed from an aeriferous cellular material sealed by a continuous liquid impervious envelope and providing a valve by which the envelope and cellular material may be deflated by vacuum, and an enlarged intake in open communication with the envelope and the interior of the cellular material to rapidly permit it to atmospherically expand to its original shape.

The principal object of my invention is in the provision of a device of this character of a body having a predetermined size and shape, constructed of resilient cellular material such that it may be deformed and deflated, with the material possessing an inherent memory regarding its original size, shape and density, and which is atmospherically responsive so as to be self-restoring and self-inflating, assuming its memorized size and shape when exposed to the atmosphere.

A further object of my invention is to provide in a device of this character a preformed body of polyurethane or other foam-like synthetic material encased in a flexible skin or envelope made from vinyl, plastic-coated nylon or a coating of any liquid-rubber or plastic composition, with the skin or envelope hermetically sealing the body therein, and providing the skin or envelope with a removable cap to permit deflating of the body and covering during its deformation and resealing the deformed device against atmospheric pressure so that the same retains its deformed or deflated condition whereby it may be readily stored or placed in a convenient container.

Another and equally important object of my invention is the provision of a device of this character having an atmospherically self-inflating body comprising a preformed member of cellular synthetic material encased within a hermetically sealed covering, including a valve-like structure permitting the forced deflating and subsequent deformation of the body member and covering, as well as the atmospheric self-inflation and restoration of its predetermined form.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

FIG. 1 is a perspective view of my improved atmospherically self-inflating buoyant device in its extended or memorized condition;

FIG. 2 is a detailed sectional view taken on line 2—2 of FIG. 1;

FIG. 3 is a view similar to FIG. 2 but showing the device in its deflated or collapsed condition;

FIG. 4 is a perspective view of my invention encased in a suitable container;

FIG. 5 is a perspective view of my device in the form of a self-inflating floatable life raft;

FIG. 6 is a detailed sectional view taken on line 6—6 of FIG. 5;

FIG. 7 is a view similar to FIG. 6, but showing the device in its deflated or collapsed condition; and

FIG. 8 is a fragmentary detailed sectional view showing the exhaust port as included in the device of FIG. 5.

In the most simplified application of my invention, I provide a pre-shaped rectangular buoyant device 10, as shown in FIG. 1. The preformed body member 11 is preferably constructed from, but not limited to, a polyurethane synthetic material, which material comprises a cellular low-density composition capable of retaining a predetermined shape having specific size and elastic qualities. The inherent properties of the synthetic aeriferous material comprising the body member 11 possess a memory, in that, when it is uninhibited and exposed to normal atmospheric pressure, it will retain its predetermined shape and size, while, through its elastic qualities, it may be deformed and deflated, and if maintained in such condition against the atmospheric pressure, will retain its deformed condition; or, upon exposure to atmospheric pressure, its inherent memory will return it to its predetermined size and shape.

The preformed body member 11 is encased in an envelope 12 preferably constructed of vinyl or plastic-coated nylon whereby the polyurethane body material is hermetically sealed. The envelope 12 is stretched over the body 11 as taut as possible without deforming the same.

An alternate method of providing a skin for the body 11 is to apply a sprayed coating of liquid plastic rubber or rubberized composition; or the entire device 10 may be dipped in such solution to seal the outer cellular surfaces of the body.

As shown in FIG. 1, one end wall 13 of the device 10 is provided with an orifice having a removable cap 14. This orifice provides an air passage through the envelope or skin 12 for the cellular body material 11, and may be constructed in the form shown in FIG. 8 as herein-after described.

When the cap 14 is removed, exposing the air passage, the device 10, starting at the opposite end 15 thereof, may be forcibly compressed and rolled or folded in the direction of the end wall 13. This procedure will exhaust the air from the cellular body material 11, deforming the same into a high density packed body, greatly reduced in size from its original condition.

When the cap 14 is replaced, sealing the orifice and preventing atmospheric re-entry into the envelope 12 and cellular body material 11, the components will retain their deflated and deformed condition as seen in FIG. 3.

In the event the device 10 is rolled, it may be conveniently stored in its deflated and deformed condition in a container 16 such as is shown in FIG. 4, which has a slide fastener closure 17.

When the device is to be utilized in its original predetermined shape, it is removed from the container 16 and the cap 14 is withdrawn from the orifice, permitting normal atmospheric pressure to be admitted into the envelope 12 and the cellular body material 11, to activate the inherent memory of such material 11, causing the self-inflation and return of the body to its original predetermined size, shape and density, as shown in FIGS. 1 and 2. The cap 14 is then replaced over the orifice, again sealing the device 10, thus forming a buoyant semi-elastic body susceptible to a variety of uses, such as a life raft, a sleeping mattress, a cushion, a bumper or protective device, or the like.

In FIG. 5 I show a specific application of my invention. This adaptation embodies a preformed life raft 18 providing a center well 19 surrounded by a continuous wall 20 formed from any suitable cellular synthetic aeriferous material. The wall 20 is encased in an envelope

21 composed of a substance like that of the skin 12 herebefore described. The envelope 21 is wrapped about the four sides of one portion 22 of the continuous wall 20 and stretched therefrom and around the opposite portions of the continuous wall 20, providing therebetween a flooring 24 for the well 19.

In the top surface 25 of the wall 20 adjacent one end, I provide an air intake port 26 and an exhaust valve 27. The exhaust valve 27 may be of any suitable construction and, as such, comprises no part of the present invention except for its conventional relation to the complete device.

The air intake port 26 is of a specific construction in that I desire to expose as great an area of non-coated or unsealed cellular material 28 from which the body of the life raft 18 is formed; this for the reason that the greater the exposed area, the more rapid will be the inflation activation of the inherent memory of the body material when it is exposed to the atmospheric pressure surrounding it.

As shown in FIG. 8, a portion of the top surface 25 of the body material 28 is relieved to provide a recess 29 which receives a wire screen cup 30. The screen cup 30 is carried by an externally threaded collar 31 providing a peripheral flange 32 disposed between the envelope 21 and the cellular body material 28. A sealing gasket 33 is fixed to the outer surface of the envelope 21 about the exposed portion of the collar 31 to hermetically seal the connection therebetween. A removable cap 34 is threadable upon the collar 31 to seal or permit access to the interior of the envelope 21 and the cellular body material 28.

When it is desired to store the life raft 18, a suitable evacuation type pump or other means is connected to the valve 27, and the air is extracted from the cellular body material 28, causing the same to collapse and be deformed into the condition shown in FIG. 7. In its deflated condition as viewed in FIG. 7, the life raft 18 may be conveniently rolled or folded and placed into a storage container much like that illustrated in FIG. 4.

When it becomes necessary to utilize the life raft 18, all that is required to be done is to remove the cap 34 and under the atmospheric pressure surrounding the device, the inherent memory of the cellular material will be activated, and it will restore itself by self-inflation into its original shape and size. Upon replacing the cap 34 there is provided a water-tight buoyant life raft.

One of the outstanding safety features incorporated in my invention is that in the event that the envelope 21 develops a tear or puncture when the life raft is not in use, activation of the memory of the cellular material will be effected and the material will seek to restore itself to its original size and shape, thus giving visual indication while the life raft is not in use that it is in need for repair or restoration.

The extreme simplicity and ease of inflating and deflating my device makes it readily usable by men, women and children.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I therefore do

not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. An atmospherically self-inflating life raft comprising:

(a) a one-piece preshaped buoyant aeriferous resilient memory member having a first memorized condition and a second deflated condition with the member having a center opening therein forming the side-walls of said life raft,

(b) a continuous air and liquid impervious envelope hermetically sealing the outer exposed surfaces of said memory member, and extending across one side of the opening formed therein so as to provide a bottom wall therefor,

(c) a valve through which the atmosphere in said envelope and said aeriferous member is evacuated to permit the external atmospheric pressure to collapse said memory member into its second deflated condition within said envelope and into the plane of said bottom wall,

(d) and means for admitting atmosphere into said envelope and said aeriferous member when said memory member is in its second deflated condition to permit the same to resiliently assume its first memorized envelope filling condition.

2. An atmospherically self-inflating buoyant device as defined by claim 1 wherein said resilient memory member is composed from a continuous unobstructed synthetic cellular material.

3. An atmospherically self-inflating buoyant device as defined by claim 1 wherein the envelope is composed of a vinyl or plastic material covering and sealing the outer exposed surfaces of said resilient memory member.

4. An atmospherically self-inflating buoyant device as defined by claim 2 wherein said atmosphere admitting means includes an enlarged air passage, having communication with said envelope and the interior of said one-piece continuous unobstructed cellular member, and a removable cover therefor through which the device may be rapidly inflated.

5. An atmospherically self-inflating buoyant device as defined by claim 2, wherein said impervious envelope for sealing the outer exposed cells of said cellular material consists of a coating of liquid rubber or the like.

References Cited

UNITED STATES PATENTS

2,803,023	8/1957	Rosenberg et al.	9—338
2,997,100	8/1961	Morris	5—348
3,017,642	1/1962	Rosenberg et al.	9—338 X
3,133,696	5/1964	Mirando	5—348 X
3,205,106	9/1965	Cross	264—45 X
3,271,797	9/1966	Boyce	5—348

MILTON BUCHLER, *Primary Examiner*.

60 T. MAJOR, *Assistant Examiner*.