Feb. 25, 1964 R. GENTILE 3,121,889

MARKER BUOY

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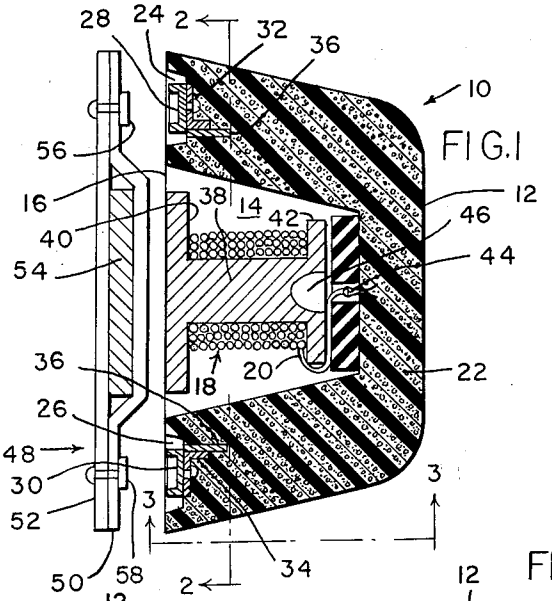


FIG. 1

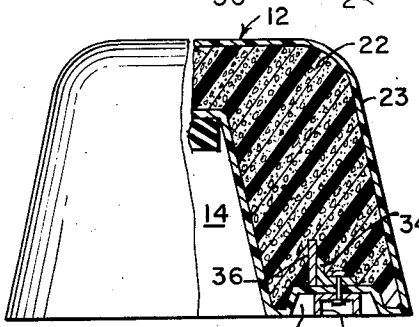


FIG. 4

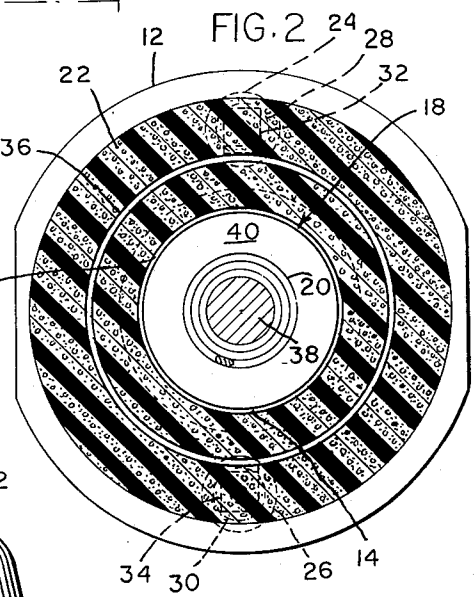
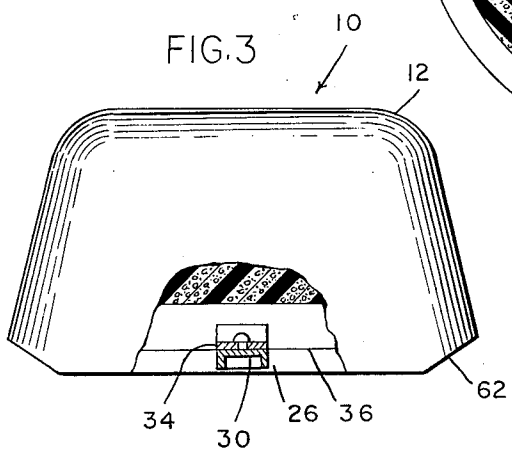


FIG. 2

FIG. 3



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MARKER BUOY

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This invention relates to buoys and more particularly to marker buoys for use in marking a spot or area or submerged object in the water so that the spot, area or object can again be easily located.

A principal object of the invention is to provide a rugged marker buoy which is carried on or about a person's belt and quickly and easily releasable therefrom.

Another object of the invention is to provide a marker buoy having a buoyant element or float comprising a cellular plastic material, the buoyant element having a construction which is strong and durable and which will firmly retain or secure suitable fastening elements carried thereby.

Still another object of the invention is to provide a marker buoy which is of simple but rugged construction, easy to use above or below the surface of water and of low cost.

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

The invention accordingly comprises the marker buoys possessing the construction, combination of elements and arrangement of parts which are exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

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

FIGURE 1 is a diagrammatic sectional view of the marker buoy;

FIG. 2 is another diagrammatic sectional view taken along the line 2—2 of FIGURE 1;

FIG. 3 is a view with parts broken away of the marker buoy taken along the line 3—3 of FIGURE 1; and

FIG. 4 is a diagrammatic sectional view of another embodiment of the invention.

Marker buoys of a size and weight capable of being carried by a skindiver, fisherman or the like for use in marking the location of a certain area of water or a submerged object or article have heretofore been described. However, such portable marker buoys have been found to possess one or more deficiencies, particularly when sought to be used by skindivers. For example, some marker buoys do not have means for suitably securing the buoy to the skindiver. In such cases, it is necessary to hand carry or hold the buoy until used, thus restricting or limiting the use of the hand. This is not desirable for skindivers since the marker buoy may interfere with the skindiver's swimming and since, from a safety standpoint, the hands of the skindiver should be as free as possible in order to allow him to immediately cope with problems which might arise. Mention has also been made of marker buoys capable of being carried on a skindiver's suit, for example, on or about his belt. However, in many cases, the means utilized to secure the marker buoy to the skindiver does not provide for the easy and immediate release or detachment of the marker buoy.

It has also been proposed to employ marker buoys having a buoyant element or float composed of a cellular plastic material, e.g., a foamed or expanded synthetic resin such as polyurethane. Many of such cellular buoyant elements lack sufficient strength and rigidity so that

after only little use they often crumble or break up. Moreover, the cellular-buoyant material by itself generally does not provide a good base or anchoring medium for fastening means which may be carried thereby to secure the marker buoy to the skindiver. Thus, after some use, the fastening means may become dislodged from the cellular material.

Another deficiency resides in that in many cases the marker buoy is of a construction such that the length of flexible cord or line connecting the cellular float and sinker and stored or carried within or without the float is released in a manner such that the cord may become undesirably knotted or entangled.

In the present invention, there is provided a compact, rugged marker buoy which may be readily carried on or about a belt and immediately and easily releasable therefrom even when the person or skindiver is wearing bulky gloves. Moreover, in the present invention there is provided a marker buoy having a float of a cellular plastic structure which is suitably internally reinforced to provide strength and rigidity thereto thus providing for long life. The internal reinforcing means also provides a base to which fastening means such as snap fasteners may be firmly and securely attached so that even after repeated use the fastening means will not become loose or removed from the float. Furthermore, the present invention also provides a marker buoy having a hollow cellular plastic float within which a spool-like sinker with a predetermined length of flexible cord or line wound therearound is carried. The sinker is of a spool-like construction so that the cord, on unwinding from the sinker, is prevented from becoming knotted or entangled.

Referring now to the drawings, there is shown a marker buoy 10 comprising a hollow float 12 provided with a chamber or compartment 14 having an open bottom end 16, a spool-like sinker designated as 18 within said chamber, and a predetermined length of flexible cord 20 secured to float 12 and secured and wound about sinker 18. The float 12 is shown as having a substantially frustoconical shape. It is to be understood, however, that the float 12 may have other shapes, for example, square shaped, pyramid shaped, dome or hemispherical shaped, or the like. The chamber 14 may also be of a configuration other than that shown. However, it must be of a size and configuration sufficient to completely store or contain therein sinker 18 having a determined length of cord wound thereon.

The float 12 may be formed of a suitable buoyant material. Preferably, the float 12 comprises a cellular plastic material 22 having substantial rigidity, low water absorption, good buoyancy characteristics and an appreciable resistance to attack by oil and gasoline. In one preferred embodiment, the float 12 comprises cellular or foamed polyurethane. In addition to polyurethane, other suitable foamed or expanded synthetic resins or plastics may be utilized to form cellular float 12. For instance, mention may be made of foamed vinyls such as, for example, foamed polyvinyl chloride, foamed or expanded polystyrene, cellular polyolefins such as polyethylene and polypropylene, polyepoxide foams, cellular cellulose acetate and the like.

Coloring material such as a dye or pigment is preferably added to or incorporated in the cellular plastic material so as to impart thereto properties which will facilitate the location of the float during the daytime and/or nighttime. The float 12 may thus have, for example, an orange, red or yellow color to provide easy visual spotting during the daytime. Colorants which provide fluorescence or the like may also be incorporated in the float so that its visual location during darkness may be facilitated.

At the bottom of float 12 there is provided a pair of cavities 24 and 26. Included within cavities 24 and 26 are snap fastener elements 28 and 30 respectively. The cavities and snap fastener elements contained therein are carried or located at diametrically opposite portions of the bottom of float 12. The aligned, diametrically opposed pair of snap fastener elements 28 and 30 are securely attached by suitable means to a pair of tab or bracket means 32 and 34 embedded in float 12. Snap fastener element 28 is secured to bracket means 32 while snap fastener element 30 is secured to bracket means 34. The pair of brackets, here shown as being L-shaped, are spaced apart so as to be in substantial superposed relationship or alignment with the snap fastener elements to which they are joined. As shown, the bottom portion or end of each of the L-shaped brackets is secured to a snap fastener element. One convenient method of accomplishing this attachment is to provide in the bottom end of each bracket a hole or slot through which a rivet, bolt or the like is passed to firmly join the snap fastener element and bracket together. The top portion or end of the L-shaped bracket is secured to a reinforcing ring 36 of, for example, stainless steel strip, the ring being internally embedded in float 12. The brackets may be secured to the reinforcing ring 36 by suitable means such as by welding, if both are metallic, or by riveting, bolting or the like. It should be mentioned that the tab or bracket means may comprise an integral part of reinforcing ring 36.

The reinforcing ring 36 which is internally embedded in the float 12 may have a cross-section other than that shown. For example, instead of the substantially rectangular cross-section illustrated, the ring may also have a square cross-section, circular cross-section, tubular cross-section or the like. The reinforcing ring 36 may be formed of a number of materials. For example, the ring may be metallic, e.g., stainless steel, aluminum or the like, or it may be of wood, or of a synthetic resin or plastic or other suitable material. When a plastic material is utilized as the reinforcing ring it is of a structure other than that of the float, that is, the reinforcing ring does not possess a foamed or cellular structure. The reinforcing ring provides additional rigidity and strength to the hollow cellular float. Moreover, being internally embedded completely around the float, it also provides an excellent base or anchoring medium for securely holding the snap fastener elements in place so that even after repeated pulling thereon they will not become undesirably loose or dislodged from the float.

Adapted to be completely contained within chamber 14 is spool-like sinker or weight 18, preferably of lead, comprising a shaft 38 shown here as being cylindrically shaped having at or near the ends thereof a pair of disc shaped rims. The rims comprise a lower or base rim 40 and an upper rim 42. Rim 42 located at or near the upper end of shaft 38 is preferably of a diameter less than that of base rim 40. The shaft 38 is of a diameter substantially less than either of the rims 40 and 42, thus forming with the rims a means for storing a predetermined length of flexible cord or line 20. The cord 20 may, for example, comprise rope, vinyl cord, nylon cord, polyethylene cord or the like.

The cord 20 is attached at one end to the sinker 18 and preferably to the shaft 38 and at the other end to an eye loop 44 which extends into the upper portion of chamber 14. The eye loop is firmly secured in the upper portion of the cellular float such as shown in FIGURE 1. A shallow, centrally disposed cavity or bore 46 is provided in the upper end of sinker 18 so as to provide a space to receive the eye loop 44 when the sinker is tightly contained within the chamber 14. To prevent movement of the sinker within the chamber there is provided at the top portion of chamber 14 a pad of resilient material such as rubber or the like.

The buoy may be conveniently carried by a person, e.g., a skindiver, by providing on his belt or on a support or clip carried about his belt suitably spaced snap fastener elements which coact or cooperate with the snap fastener elements carried by the float 12. The snap fastener elements of the float and those carried by the person's apparel preferably comprise coacting male and female parts, one part being carried by the float and the other part carried by the person's apparel.

In one embodiment, there may be utilized a narrow support 48 comprising a front portion 50 and a back portion 52 joined together to form a closed loop about belt 54. Mounted on the front portion 50 are a pair of suitably spaced snap fastener elements 56 and 58 which coact with the male or female snap fastener elements 28 and 30 respectively carried by the float 12. Thus, there is provided a quick detachable fastening means for mounting or securing a marker buoy to a person.

In order that the buoy can be instantaneously detached or released from the coacting snap fasteners, the float is provided with detachment means which can be easily grasped and pulled so as to pull the cooperating snap fasteners apart. In one embodiment of the invention, the float 12 is provided with at least one and preferably two beveled portions 60 and 62 located at the lower or bottom outermost circumference of the float. As shown in FIG. 3, diametrically opposed portions of the lower outermost portion of float 12 are suitably beveled. The beveled portions are substantially parallel to the aligned snap fasteners carried by the float. The detachment of the buoy is thus simply and instantaneously achieved by placing the fingers under one of the beveled edges or portions and pulling so as to release the cooperating snap fasteners. The beveled portions thus provide quick means for releasing the buoy even when bulky gloves are worn. Instead of beveled portions, one or more tab means attached to the bottom of the float and extending outwardly therefrom may also be employed to provide means which when pulled will result in the release of the buoy.

In another embodiment of the invention, longer float life can be achieved by substantially completely encasing or surrounding the cellular float 12 in a protective casing or enclosure 23 (as shown in FIG. 4) of a suitable plastic or polymeric material in non-cellular form; the float casing having substantially the same shape or configuration as the cellular float. In other words, the cellular float 12 can be provided with a form-fitting casing comprising a polymeric material in substantially solid form, i.e., of a non-cellular nature. Among the many thermosetting and thermoplastic polymeric materials which may be utilized to form the float casing, mention may be made of, for example, acrylonitrile-butadiene-styrene plastics, acrylics such as polymethylmethacrylate, alkyds, allylics, amino plastics such as melamine-formaldehyde and urea-formaldehyde, cellulosic plastics such as cellulose acetate butyrate, cellulose propionate and the like, polyamide resins, phenolics such as phenol-formaldehyde and the like, polyesters, polyalkylenes such as polyethylene and polypropylene, polystyrene, and vinyl resins such as polyvinyl chloride etc. The plastic float casing can be suitably colored so as to impart thereto properties which will facilitate the location of the float during the daytime and/or nighttime.

In operation, the cord is wound about the shaft of the sinker which is then placed in chamber 14 of float 12. The buoy is then detachably secured to a belt, or to a support carried by a belt or to some other portion of the apparel worn by the person by means of the coacting snap fastener elements. The buoy when attached and carried by a person under water is of neutral buoyancy until released. The sinker within chamber 14 of the float is held so that it has little or no movement. When it is desired to release the buoy either above, at, or below the surface of the water to mark a spot or object in the water, the fingers are placed under one of the beveled portions

and the float pulled so as to release the cooperating snap fasteners. The release of the buoy permits the float to rise or remain on the surface of the water and the sinker, attached by means of a cord to the float, to fall from the float chamber where it had been carried and sink toward the bottom. As the sinker drops, the cord wound and stored around the shaft thereof unwinds. By providing rims 40 and 42 on the sinker 18, the wound cord, rather than being released all at once or in batches with the danger of knotting or entanglement, must be uncoiled or unwound.

Since certain changes may be made in the above buoy 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 as illustrative and not in a limiting sense.

What is claimed is:

1. In the combination of a marker buoy and a means for supporting said buoy about a belt, said marker buoy comprising a float having a chamber which is open at the bottom end thereof, said float comprising a cellular plastic material, a spool-like sinker releasably carried within said chamber, a predetermined length of flexible cord wound upon said sinker, one end of said flexible cord being secured to said float and the other end of said flexible cord being secured to said sinker, and a pair of spaced snap fastener elements secured at the bottom of said float, said means for supporting said marker buoy comprising a closed loop having secured thereto a pair of spaced snap fastener elements which coact with the snap fastener elements carried by said float.

2. The marker buoy of claim 1 wherein a casing comprising a non-cellular plastic material is provided around the cellular float.

3. The marker buoy of claim 1 wherein at least one beveled outer edge portion is provided at the bottom of said float.

4. The marker buoy of claim 1 wherein said pair of snap fastener elements are located at directly opposite portions of the bottom of said float.

5. A marker buoy which comprises a hollow float, said float comprising a cellular plastic material, a spool-like sinker releasably carried within said float, a predetermined length of flexible cord wound upon said sinker, one end of said flexible cord being secured to said float and the other end of said flexible cord being secured to said sinker, a pair of spaced snap fastener elements at the bottom of said float, a reinforcing ring member internally embedded in said float, a pair of bracket means joining said snap fastener elements and said reinforcing ring member, and at least one beveled outer edge portion at the bottom of said float.

6. The marker buoy of claim 5 wherein a casing comprising a non-cellular plastic material is provided around the cellular float.

7. A marker buoy which comprises a hollow float having a substantially frusto-conical shape, said float comprising a cellular plastic material, a spool-like sinker releasably carried within said float, a predetermined length of flexible cord wound upon said sinker, one end of said flexible cord being secured to said float and the other end of said flexible cord being secured to said sinker, a pair of diametrically opposed snap fastener elements at the bottom of said float, a reinforcing ring member internally embedded in said float, a pair of bracket means in substantial alignment with said snap fastener elements extending from said reinforcing ring member, said snap fastener elements being secured to said bracket means, and a pair of diametrically opposed beveled portions at the bottom outermost circumference of said float.

8. The marker buoy of claim 7 wherein said cellular plastic material comprises polyurethane.

9. The marker buoy of claim 7 wherein said float contains a coloring material.

10. The marker buoy of claim 7 wherein a casing comprising a non-cellular plastic material is provided around the cellular float.

11. In the combination of a marker buoy and a means for supporting said buoy about a belt, said marker buoy comprising a hollow float, said float comprising a cellular plastic material, a spool-like sinker releasably carried within said float, a predetermined length of flexible cord wound upon said sinker, one end of said flexible cord being secured to said float and the other end of said flexible cord being secured to said sinker, a pair of snap fastener elements positioned at directly opposite portions of the bottom of said float, a reinforcing ring member internally embedded in said float, a pair of bracket means joining said snap fastener elements and said reinforcing ring member, and at least one beveled outer edge portion at the bottom of said float, said means for supporting said marker buoy comprising a closed loop having secured thereto a pair of spaced snap fastener elements which coact with the snap fastener elements carried by said float.

12. A marker buoy which comprises a float having a chamber which is open at the bottom end thereof, said float having a substantially frusto-conical shape comprising a cellular plastic material, a spool-like sinker releasably carried within said chamber, a predetermined length of flexible cord wound upon said sinker, one end of said flexible cord secured to said float and the other end of said flexible cord secured to said sinker, a pair of diametrically opposed snap fastener elements at the bottom of said float, a reinforcing ring member internally embedded in said float, a pair of bracket means in substantial alignment with said snap fastener elements extending from said reinforcing ring member, said snap fastener elements being secured to said bracket means, and a pair of diametrically opposed beveled portions at the bottom outermost circumference of said float.

13. In combination with said marker buoy of claim 12, a means for supporting said marker buoy about a belt which comprises a closed loop having secured thereto a pair of spaced snap fastener elements which coact with the snap fastener elements carried by said float.

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