March 10, 1959 A. P. LUND 2,876,467

COLLAPSIBLE RAFT

Filed Oct. 25, 1955

FIG. 2

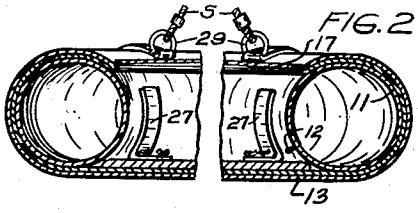


FIG. 1

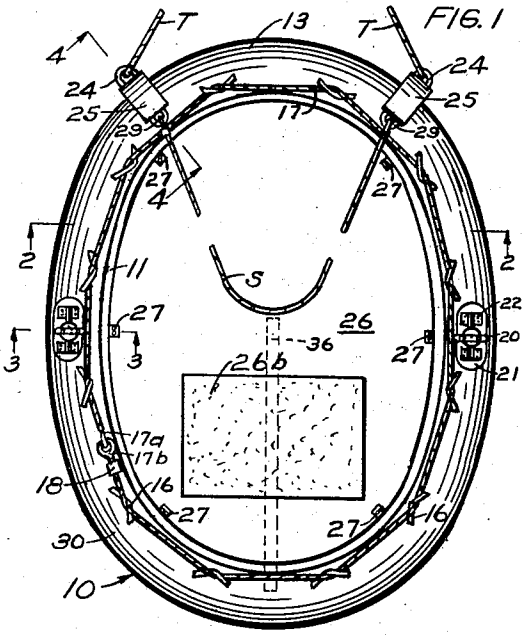


FIG. 3

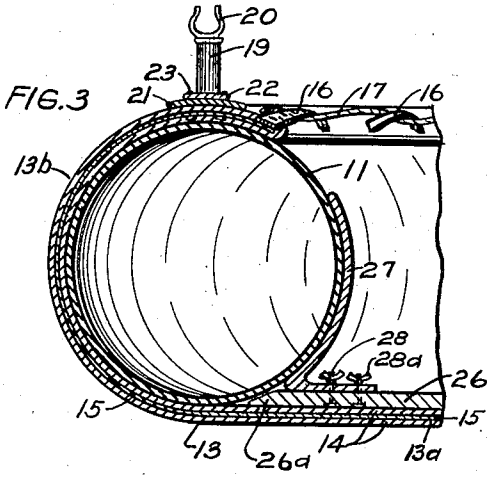


FIG. 4

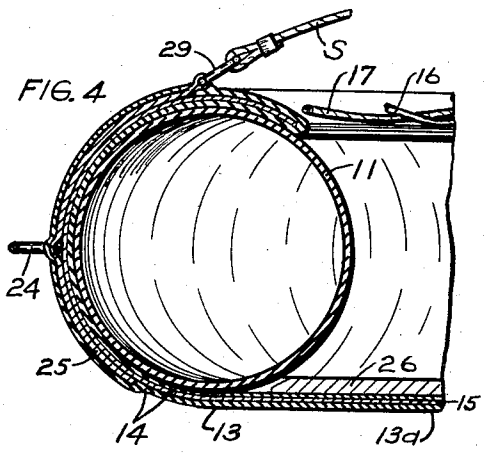


FIG. 5

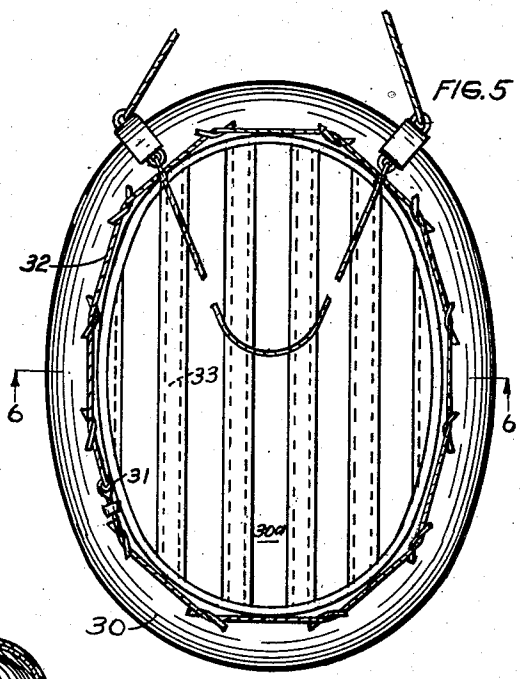
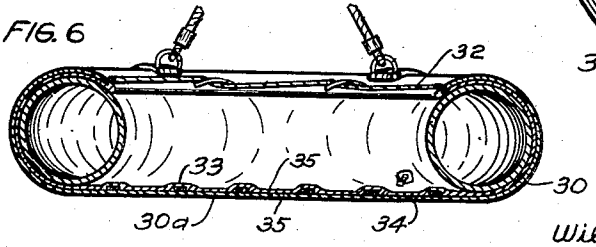


FIG. 6



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COLLAPSIBLE RAFT

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3 Claims. (Cl. 9—11)

This invention relates to collapsible crafts such as boats, rafts and the like.

An object of my invention is to provide a new and improved collapsible craft of simple and inexpensive construction and operation which may be utilized in the water for a wide variety of purposes.

Another object of my invention is to provide in a collapsible craft, a novel, flexible cover constructed for embracing an inflatable tube which may be readily and easily removed from the cover to adapt the craft to be collapsed into small compass.

Still another object of my invention is to provide a collapsible craft which is adapted to be towed at high speed over the water with a person standing therein.

A further object of my invention is to provide an improved collapsible craft having a pliable cover constructed to embrace a continuous inflatable tube and thereby define an open topped cockpit, the cover being adjustably secured to the tube in a manner to permit the cover to be properly adjusted if the size of the inflatable tube is changed and thereby maintain maximum stability in the craft.

A still further object of my invention is to provide in a novel collapsible craft, a rigid floor or bottom which is readily and easily installed and removed to permit the craft to be quickly made ready for use and to be collapsed into small compass for transporting and storage.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same parts throughout the several views and in which:

Fig. 1 is a top plan view of the invention;

Fig. 2 is a section view being partly broken away and taken on a vertical plane substantially at 2—2 of Fig. 1;

Fig. 3 is a detail vertical section view taken on a plane substantially at 3—3 of Fig. 1;

Fig. 4 is a detail section view taken on a vertical plane substantially at 4—4 of Fig. 1;

Fig. 5 is a top plan view of a modified form of the invention; and

Fig. 6 is a section view taken on a vertical plane substantially at 6—6 of Fig. 5.

One embodiment of the present invention is shown in Figs. 1 to 4. The invention consists in a collapsible craft indicated in general by numeral 10 which may be readily and easily folded to small compass. An elongated and endless inflatable tube 11 is provided which is constructed similarly to an inner tube used with the conventional truck tire. In the form shown the inflatable tube or buoyant member 11 is somewhat elliptically shaped, although it might have another configuration such as annular or substantially rectangular. The inflatable tube 11 is provided with an inflation valve 12 also of the type conventional to inner tubes. Air may be forced under pressure into the tube 11 through valve 12 and may also be released therethrough.

A hull member or cover 13 embraces the tube 11 to define an open-topped cockpit in the central opening defined by the tube. The cover 13 in the form shown, is constructed of a strong and waterproof pliable sheet material. The cover member 13 in the form shown, is constructed of a pair of rubber laminations 14 with a sheet 15 of fabric reinforcing material vulcanized therebetween. The central portion 13*a* of the cover 13 extends across the lower side of the tube 11 and the outer peripheral portion 13*b* of cover 13 extends upwardly and inwardly around the outer periphery of tube 11. It should be understood that the cover or hull member 13 may be constructed of any suitable waterproof pliable material including various types of canvas, sheet synthetics and the like.

Means are provided for securely retaining the cover 13 on tube 11 and for drawing spaced portions of the periphery of cover 13 toward each other. In the form shown, a plurality of guides or loops 16 constructed of webbing are secured to the peripheral portions 13*b* of cover 13 at spaced intervals therearound. The loops 16 may be sewed or otherwise affixed to the fabric reinforcing 15 of the cover 13 and integrally molded into the rubber laminations. An elongated flexible element or retainer 17 extends around the periphery of cover 13 and is threaded through the loops 16. The flexible element 17 may be a suitable cord or cable. The cord 17 is adjustable in length and may have a loop 17*a* formed in one end thereof to receive and hold the other end 17*b* thereof which is secured upon itself by such means as clevis 18. Of course it should be understood that the opposite ends of the cord 17 may be tied together if the collapsible boat is to be used in such a manner that frequent adjustment of the cord is necessary. The cord 17 also provides a hand rail around the cockpit defined by the tube 11 and cover 13. The hand rail is accessible from outside of the boat as well as inside of the boat.

The collapsible boat 10 is also adapted for use with oars. In the form shown oarlocks 19 are provided on opposite sides of the cover member 13 and are adapted to receive a swivel hook 20 of a conventional type for carrying oars. The oarlock may be mounted on the cover 13 in any suitable manner and in the form shown, a reinforcing plate 21 is secured to the cover member 13 and the mounting flanges 22 of the oarlock 19 are secured onto the mounting plate 21. In the form shown, suitable rivets 23 are provided for securing the mounting plates 21 and flanges 22 onto the cover 13.

Means are also provided for securing the boat 10 to a towing rope T and in the form shown, such means include a pair of rings 24 which are securely fixed to the cover member 13 by means of web straps 25 which are fixedly secured as by sewing to the fabric reinforcement 15 of the cover 13. The web straps 25 may be molded within the outer rubber lamination 14. Towing ropes T may be secured to each of the rings 24 and to a power boat for towing the collapsible craft 10.

Means are also provided for rigidly reinforcing the bottom of the boat 10 and the central portion 13*a* of cover 13. In the form shown, such means include a rigid flooring or bottom 26 which is contoured to substantially the same shape as the tube 11 so as to be adapted to be received in the opening defined thereby. The marginal edge portion 26*a* of floor 26 is beveled so as to engage the lower side of the tube 11 over a substantial area. The floor 26 is carried on the central portion 13*a* of cover 13 and the marginal edge portion 26*a* is cooperatively clamped in position by the tube 11 and the cover 13. Releasable means are provided for fixing the floor 26 in a desired position in the open cockpit of the boat. In the form shown such means in-

clude a plurality of engaging or retaining elements 27 which are arcuately curved and which extend upwardly from flooring 26 to which they are releasably secured. The engaging elements 27 may be releasably secured to flooring 26 by any suitable means and in the form shown are secured by means of bolts 28 having wing nuts 28*a* thereon. It should be noted that the engaging elements 27 are disposed in spaced relation with each other around the periphery of flooring 26 to prevent longitudinal and lateral shifting of the flooring.

A pair of rings 29 are also secured to the upper ends of web straps 25 to provide means for securing a support rope S thereon. Such a rope S is of the type conventionally used with surf boards for holding the front end thereof in an elevated position relative to the rear end when traveling over the water. The rear portion 26*b* of flooring 26 may be roughened by suitable means so as to provide a non-slip platform upon which a person may stand.

A forwardly and rearwardly extending keel 36 may be secured to the central portion of the bottom 13*a* of the craft. The keel may be constructed of reinforced rubber and may be securely anchored to the fabric liner material 15.

In the form of the invention shown in Fig. 5, the collapsible boat is constructed in a substantially identical fashion to that form shown in Figs. 1 to 4. In this form of the invention cover 30 is constructed to embrace the tube 31 and be securely held thereon by means of the cord 32 in a fashion similar to that previously described. In this form of the invention the central portion 30*a* of the cover 30 is provided with a plurality of longitudinally extending ribs 33 of substantially rigid material such as wood, metal or other suitable synthetic material. In the form shown the ribs 33 are affixed to the fabric reinforcement 34 which is molded between the rubber laminations 35 of the cover member 30. The ribs 33 may also be molded into the rubber.

In operation, the form of the invention shown in Figs. 1 to 4 may be used in the condition shown in the figures. The collapsible boat 10 may be used as a raft and be securely anchored to suitable anchoring means by a line attached to the anchoring means and to one of the towing rings 24. The collapsible boat 10 may also be used as a glider to be towed by means of tow ropes T behind a powered boat. The floor 26 provides the necessary rigidity in the bottom of the boat necessary for movement across the water at high speeds. The rigid bottom substantially stabilizes the boat as it moves across water at high speeds, particularly where the water is somewhat choppy or wavy. This will substantially always be the case in the use of this glider because of the wake created by the power boat.

When the boat is to be collapsed for storage or transportation the bottom 26 will be removed from the boat by first removing certain of the retaining elements 27 to permit the bottom 26 to be shifted from one side or the other, which will allow it to be slipped out of the cockpit opening. The inflatable tube 11 may be deflated to permit the necessary shifting.

The adjustable cord 17 may be substantially lengthened to permit the inner marginal edge of the cover 13 to be lifted and shifted so as to permit the inflatable tube 11 to be removed. Tube 11 may be completely deflated before it is withdrawn from the cover member 13 as desired. The cover member 13 may thereafter be folded into small compass as may the inflatable tube 11. It will be seen that the collapsible boat 10 may be quickly and easily reassembled and put into condition for use after having been collapsed for storage.

In the form of the invention shown in Figs. 5 and 6, the cover member 30 when removed from the inflatable tube 31 may be rolled from one side to the other so as to be adapted for storage in deflated condition.

It will be seen that I have provided a new and improved collapsible boat or craft wherein the cover member for embracing the inflatable tube is securely held thereon by adjustable means which will draw the cover tightly onto the tube. When the cover tightly embraces the tube the craft is substantially more stable than when the cover loosely fits around the inflatable tube, particularly when a person is in the boat.

It should also be noted that I have provided a novel collapsible boat which is well adapted for a multiplicity of uses including use as a raft anchored in a desired position and including use as a high speed glider adapted to be towed at a high rate of speed over the surface of even choppy water.

It will, of course, be understood that various changes may be made in the form, detail, arrangement and proportion of the parts without departing from the scope of my invention which consists of the matter described herein and set forth in the appended claims.

What is claimed is:

1. A collapsible craft comprising an endless and elongated inflatable tube defining a central opening and having an upper side and a lower side, a waterproof cover constructed of pliable sheet material and having a central portion extending across the lower side of said inflatable tube, said cover having peripheral portions extending upwardly and inwardly around the outer periphery of said tube, means for securing spaced portions of the cover periphery together for securely attaching the cover on the tube, a rigid floor disposed in the central opening of said tube and being carried on the central portion of the cover, and a plurality of upstanding engaging elements secured to the floor adjacent the periphery thereof, said engaging elements bearing against the inner periphery of said inflatable tube for retaining the floor and tube in a predetermined position relative to each other.

2. The structure recited in claim 1 wherein said engaging elements are elongated and arcuately curved to follow the contour of said tube, and releasable means for securing said engaging elements to said floor to permit the floor to be readily and easily removed from the craft without deflating said tube.

3. A collapsible craft comprising an endless and elongated inflatable tube defining a central opening and having an upper side and a lower side, a rigid floor disposed in the central opening of said tube, a plurality of upright tube-engaging elements secured to the floor adjacent the periphery thereof, said engaging elements being elongated and arcuately curved to follow the contour of the tube and to bear against the inner periphery of the tube, said engaging elements preventing upward and downward movement of the floor with respect to the tube.

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