

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 84302546.1

(51) Int. Cl.³: **B 63 C 9/06**
B 63 H 1/38

(22) Date of filing: 13.04.84

(30) Priority: 14.04.83 CA 425854

(43) Date of publication of application:
21.11.84 Bulletin 84/47

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

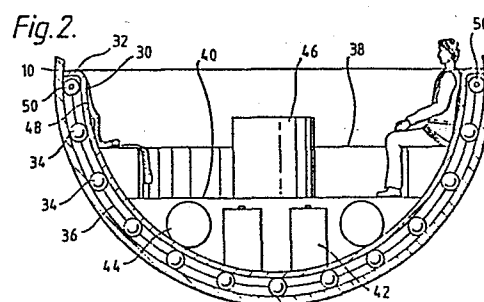
(71) Applicant: Ingle, John Wright
85 Cynthia Road
Toronto Ontario M6N 2P8(CA)

(72) Inventor: Ingle, John Wright
85 Cynthia Road
Toronto Ontario M6N 2P8(CA)

(74) Representative: Connor, Terence Kevin et al,
FITZPATRICKS Kern House 61/62 Lincoln's Inn Fields
London WC2B 6EX(GB)

(54) Shape of a marine craft, in particular of a life-boat.

(57) A marine craft having an outer hull (10) of completely spherical shape, an inner hull (30) of hemispherical shape, universal bearings (34, 36) between the inner hull (30) and outer hull (10) supporting the inner structure in the outer hull and permitting universal movement, and a mass in the inner hull, biasing it into a reference position.



TITLE:

MARINE CRAFT

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The invention relates to a marine craft, and in particular to an emergency all-weather life-saving craft such as a lifeboat.

BACKGROUND TO THE INVENTION

The design of marine craft, conventionally employs a hull which is designed to ride in the water in only one orientation, that is to say with its keel or center portion of the hull lowermost, and with the sides of the hull projecting above the water. The crew, passengers, cargo, etc. are intended to be contained within the hull.

In smaller craft the hull is simply open, and in larger craft a deck conventionally covers in the open upper portion of the hull.

Structure within the interior of the hull is normally fixed to the hull. When the hull rolls, any structure attached within the hull will, of course, roll with it. The design of ships lifeboats and other rescue craft has followed these lines. As a result, passengers and crew attempting to leave a vessel in distress are required to climb into what is essentially an open boat, which is then lowered by ropes into rough water immediately alongside the rolling vessel, after which the ropes are cast off, and an attempt is made to propel the lifeboat either with oars or under power away from the side of the sinking vessel.

It is well known that this is a most hazardous undertaking, and that it is almost never practiced in rough weather, and that in all probability more lives are lost attempting to leave a vessel than would be lost if they remained on board. Other forms of life-

saving craft involve life rafts, and inflatable craft. Life rafts are generally speaking unsuitable since persons on them are totally exposed to the elements.

In addition, in rough weather a life raft may tumble over and over, and it is almost impossible for a person to maintain his grasp in those circumstances. Inflatable rafts are provided having complex designs incorporating inflatable canopies or hoods. These inflatable craft do not appear to be entirely satisfactory. Experience of persons attempting to use them in rough weather indicates that they too are easily overturned. In addition, the rough handling likely to be experienced during an escape from a sinking vessel in rough weather is likely to puncture the craft or damage the fabric of such inflatable craft rendering them useless.

Lifeboats may be constructed with decks to enclose the hull but this is generally impractical. Such craft must be small enough to be carried on a larger vessel, and launched from it.

Hull design conventionally requires an outer skin, and an inner frame work of ribs, which support the outer skin. Where the hull is to be totally enclosed with a deck, the construction of the deck will have to follow the same general principle, that is to say, it will have to incorporate an outer skin, and ribs extending across its interior.

This will severely restrict the space available in the interior of the hull, and the seating accommodation will be limited.

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Even when fully decked-in, such a lifeboat could be capsized in rough weather, and while it might continue to float, it would be unmanageable and endanger the occupants.

Some of these considerations also apply to craft other than life saving or emergency craft.

Sports and pleasure craft may well utilize aspects of the invention with advantage.

BRIEF SUMMARY OF THE INVENTION

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With a view to overcoming these disadvantages, and providing a marine craft suitable both for life-saving purposes and many other uses, the invention comprises an outer hull of completely spherical shape, and an inner load carrying structure of hemispherical shape, and universal bearing means between such inner structure and such outer hull, supporting such inner structure within such outer hull, and permitting universal movement of such inner structure relative to such outer hull, and mass means in said inner structure, biasing the same into a predetermined reference position regardless of movement of such outer hull.

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More particularly, the invention seeks to provide a craft having the foregoing advantages, including motor means on said inner structure, engageable with and disengageable from such outer hull, whereby such outer hull may be rotated relative to such inner

hull along a predetermined axis of such inner structure, and means for operating such motor means.

More particularly, the invention seeks to provide a craft having foregoing advantages incorporating fins on the exterior of such outer hull, whereby rotation of such outer hull may cause propulsion of such craft along the surface of the water.

More particularly, the invention seeks to provide such a craft having hatchway means for entrance through said outer hull into such inner structure, and cover means for sealing such hatchway against the entrance of water.

More particularly, the invention seeks to provide such a craft having air valve means, and closure means therefor, in such outer hull, whereby air may be admitted, and water excluded.

More particularly, the invention seeks to provide such a craft having the foregoing advantages including gas storage means in such inner structure, for carrying a quantity of a breathable gas.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there are illustrated and described preferred embodiments of the invention.

IN THE DRAWINGS

cut away, showing the marine craft according to the invention, and,

Figure 2 is a section through the lower half of the marine craft Figure 1, along the line 2-2.

As best shown in Figure 1, the marine craft according to the invention comprises an outer hull 10 which is completely spherical in shape. The hull 10 has in this embodiment two access ports or hatches 12 and 14, located diametrically opposite to one another. Each of such ports 12 and 14 is provided with a hatch cover 16, 18, which is preferably swingably mounted on the hull, and may be fastened by any suitable locking or fastening means or planting means of a type well known in the art (not shown).

Such hatches will, of course, incorporate suitable sealing means to prevent entry of water.

The hull 10 is also provided with a plurality of air valves 20, located at spaced apart points. The air valves 20 incorporate suitable closure means (not shown) which are effective to prevent the entry of water, while permitting entry of air, for occupants within the hull.

The hull 10 is also provided with a plurality of fins or vanes 22, the purpose of which will be described below.

The hull 10 may also be provided with a plurality of lifting eyes 24 fastened to the exterior of the hull, by means of which the entire structure may be lifted out of the water, or lowered into it, as desired.

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Within the outer hull 10, is located an inner hull or structure indicated generally as 30. The inner hull 30 may typically be of hemispherical shape, and has an upper peripheral rim or flange 32, in this embodiment, and defines a predetermined spacing between itself and the interior of the out hull 10. Within this spacing there is provided any suitable form of universal bearing means, by means of which the inner hull 30 may rest upon the interior of the outer hull 10.

In the embodiment shown, such universal means comprise a plurality of ballbearings 34, which are preferably suitably located by means of a bearing cage 36. Typically, this cage will be of generally hemispherical shape, and lie between the inner hull 30 and the outer hull 10, its purpose being simply to locate the ballbearings.

By this means, the inner hull 30, and the outer hull 10, are rendered rotatable to one another in any axis, without any restriction.

The inner hull 30 is provided with, in this embodiment, seats consisting essentially of a continuous circular bench 38, and a floor 40. Beneath the floor 40, there will be located in a typical example, electrical storage battery 42, and gas storage means 44.

A central console 46 may also be provided for storage of food, radio equipment, flares and the like depending upon the design and usage of the

be provided with suitable personal harnesses 48, which may be used to strap in occupants as shown in Figure 2.

In order to provide a certain minimum degree of mobility, a drive transmission means is preferably provided on the inner hull 30, and engageable and disengageable with the outer hull 10.

10 In this embodiment such a drive transmission means is shown generally as a pair of electrical motors 50, mounted between the inner hull 30 and the outer hull 10. These motors will incorporate any suitable releasable drive transmission means (not shown) by means of which the interior of the outer hull may be engaged, typically frictionally engaged, and rotated relative to the inner hull by means of the motors.

In order to provide for some degree of directional control, a third directional control motor and transmission means are preferably provided in the form of the motor 52.

20 By this means the craft may be propelled to a certain degree in a predetermined direction, thereby giving it some mobility.

Typically, such motors 50 and 52 will be operated by electrical power supplied by batteries 42.

It will, of course, be appreciated, however, that it is equally possible to provide a manual form of drive transmission, operable by the occupants within the interior of the craft, and the invention is not therefore limited to motors, batteries and the like or indeed to any particular power source.

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It will, of course, be appreciated that the interior of the outer hull 10 must be substantially completely smooth and regular and free of obstructions. In this way, the ballbearings 34 will be free to roll around the interior of the hull 10, while being retained in position by means of the cage 36 and the inner hull 30. Thus, the design of the hatch covers and ports and air valves will all be such that they do not intrude into the interior of the outer hull 10, but present an essentially smooth regular surface all over such interior to provide a smooth rolling surface for engagement of such ballbearings.

It is particularly useful if the outer hull 10 is formed of transparent plastic material, or is provided with a plurality of windows all over its surface, so that the occupants within the hull may easily see out, no matter what position the inner hull is relative to the outer hull.

The outer hull will also incorporate some form of radio antenna (not shown) and radar reflector (not shown) such as are well known in the art, and these may be incorporated for example in the fins 22, or any other portion of the structure, or may be provided separately, and may be of such a type that they are telescopic or retractable, the details of which are limited for the sake of clarity.

Suitable trap doors 54 may be provided in the floor, and under the bench 38 if desired, for access to storage areas of the inner hull.

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therefore, that the inner hull 30 is provided with a biasing mass constituted in this embodiment by for example the space beneath the floor which is occupied by the gas storage, and batteries. This being the lowermost point of the inner hull 30, it will be apparent that this mass will bias the inner hull so that it always adopts a reference position due to gravity regardless of rotational movement of the outer hull relative to the inner hull.

10 Clearly, there will be some slight time lag, and the inner hull 30 will pitch and roll to some degree. Experiments, however, have shown that an unusual degree of stability can be achieved by the use of the invention, giving the occupants of the inner hull 30 a surprising degree of comfort and safety under conditions which would be impossible for any other craft.

 It will be appreciated also that other forms of bearing means may be used other than the ballbearing shown. A fluid or liquid bearing medium
20 such as air, gas, water or oil will function in essentially the same way as the ballbearings. In this case, such fluid or liquid will obviously have to be sealed around the flange 32 of the inner hull.

 The term "universal bearing means" is intended to encompass all such various different systems whereby the inner hull may be supported within the outer hull, whether disclosed herein in detail or not.

 It will also be appreciated that a marine
30 craft of the type described is not limited exclusively

to life saving or emergency situations. The principles of the invention are equally applicable to, for example, recreational craft, such as for example sport boats, observation boats and the like.

Having described what is believe to be the best mode by which the invention may be performed, it will be seen that the invention may be particularly defined as follows:

10 A marine craft comprising an outer hull of completely spherical shape, an inner load carrying structure of hemispherical shape, universal bearing means between such inner structure and such outer hull supporting such inner structure within such outer hull and permitting universal movement of such inner structure relative to such outer hull, and, mass means in said inner structure, biasing the same into a predetermined reference position regardless of movement of such outer hull.

20 The foregoing is a description of a preferred embodiment of the invention which is given here by way of example only. The invention is to te be taken as limited to any of the specific features as described, but comprehends all such variations thereof as come within the scope of the appended claims.

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1. A marine craft comprising;
 an outer hull of completely spherical shape;
 an inner load carrying structure of hemispherical
 shape;

 universal bearing means between such inner
 structure and such outer hull supporting such inner
 structure within such outer hull and permitting universal
 movement of such inner structure relative to such
 outer hull, and,

 mass means in said inner structure, biasing
 the same into a predetermined reference position regard-
 less of movement of such outer hull.

2. A marine craft as claimed in Claim 1,
 including motor means on said inner structure, engageable
 with and disengageable from such outer hull, whereby
 such outer hull may be rotated relative to such inner
 hull along a predetermined axis of such inner structure,
 and means for operating such motor means.

3. A marine craft as claimed in Claim 1 incorpo-
 rating fins on the exterior of such outer hull, whereby
 rotation of such outer hull may cause propulsion of
 such craft along the surface of the water.

4. A marine craft as claimed in Claim 1 having
 hatchway means for entrance through said outer hull into
 such inner structure, and cover means for sealing such
 hatchway against the entry of water.

5. A marine craft as claimed in Claim 1 having
 air valve means, and closure means therefor, in such outer
 hull, whereby air may be admitted, and water excluded.

6. A marine craft as claimed in claim 1 including gas storage means in such inner structure, for carrying a quantity of a breathable gas.

7. A marine craft as claimed in claim 1 wherein said universal bearing means comprises a plurality of ball bearings, and space means therefor.

8. A marine craft as claimed in claim 1 wherein said universal bearing means comprises a fluid medium captive between said inner and outer hulls.

9. A marine craft as claimed in Claim 8 wherein said fluid medium is a gas.

10. A marine craft as claimed in Claim 8 wherein said fluid medium is a liquid.

Fig. 1.

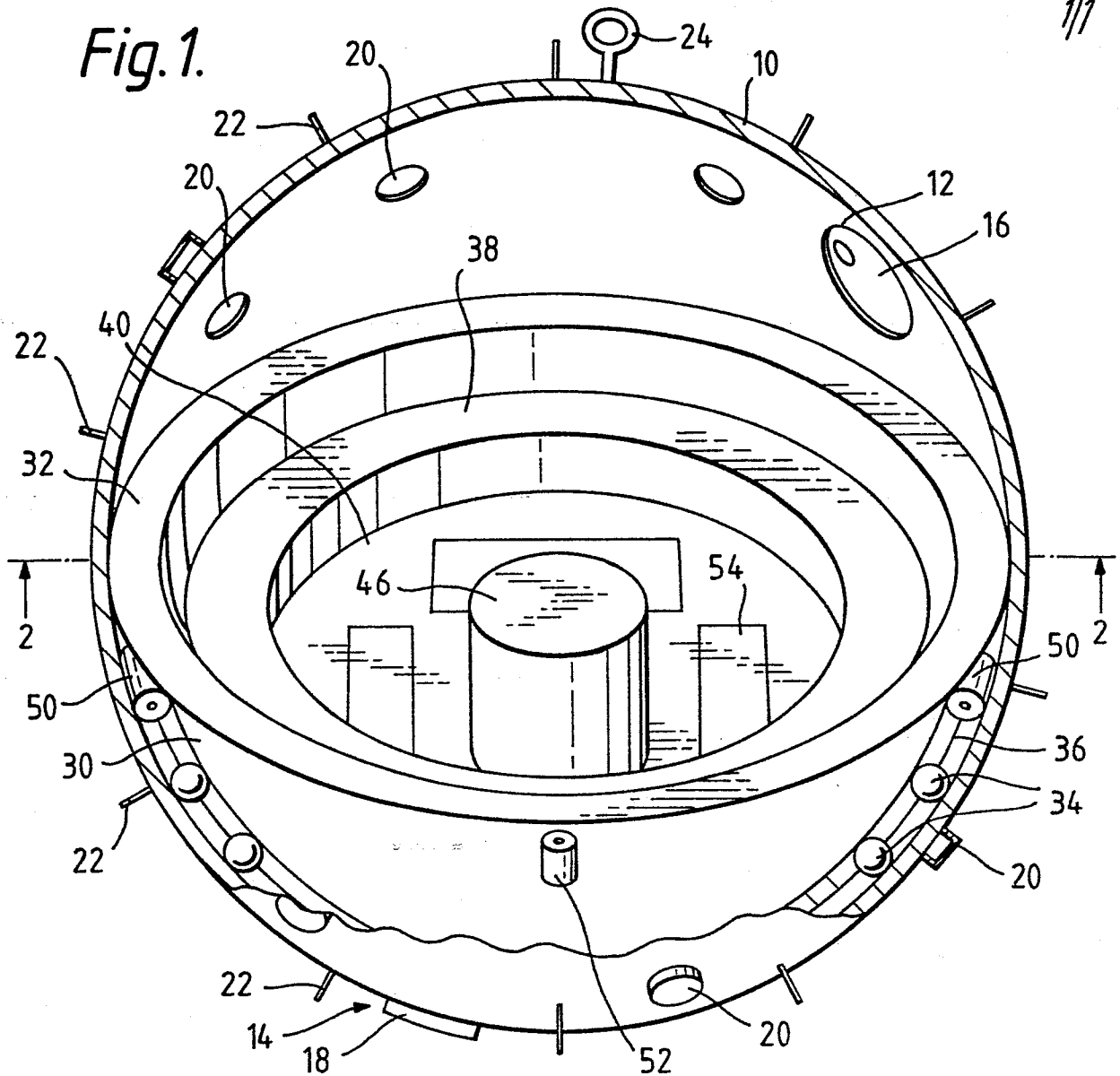
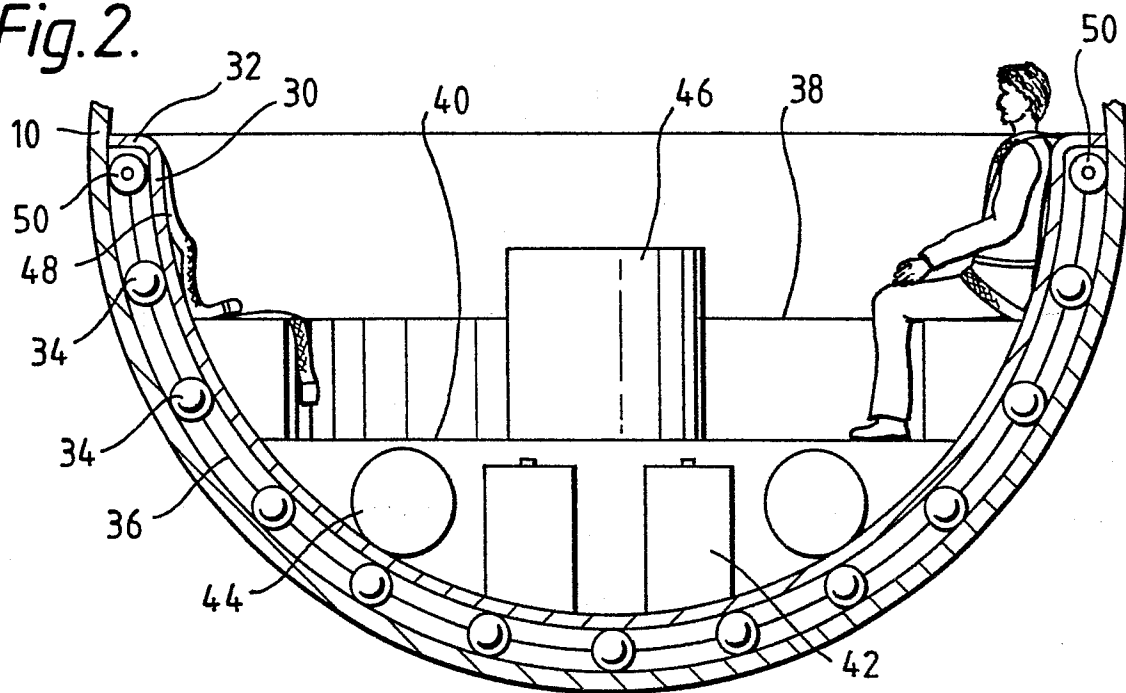


Fig. 2.





European Patent
Office

EUROPEAN SEARCH REPORT

0125799

Application number

EP 84 30 2546

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
X	DE-C- 151 028 (TERWILLEGER) * Whole document *	1,4,7	B 63 C 9/06 B 63 H 1/38
Y		2,3,6, 8,10	
X	FR-A-1 053 385 (VINCENT) * Whole document *	1,4,5, 7	
Y	DE-A-3 004 823 (LÖWEN) * Page 2, lines 10-20; page 5, lines 10-16; figures 1,2 *	6,8,10	
Y	DE-C- 156 016 (PAUL) * Page 1, lines 1-21; page 2, lines 5-14 *	2,3	TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
A	FR-A-1 255 440 (GELLE)		B 63 C B 63 B B 63 H
A	FR-A-1 403 487 (VERHOFSTEDÉ)		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24-07-1984	Examiner DE SCHEPPER H.P.H.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			