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Life raft

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<p>(54) Title: LIFE RAFT</p>		
<p>(57) Abstract</p> <p>The invention relates to a life raft comprising at least one gas-inflatable, circular float chamber (1, 2), a bottom (3) and means for launching the raft into the sea and hoisting it therefrom. A raft bottom (3) equipped with openings is adapted to bridge the inner circumference of the circular float chamber (1, 2), advantageously at a distance upward from the lower rim of the lower chamber (1).</p>		

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**Life raft**

The present invention relates to a life raft according to the preamble of claim 1.

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Life rafts have already for decades formed a piece of standard outfit in the lifesaving equipment aboard ships. Since 1986, international SOLAS regulations have required passenger and freight vessels to be equipped with so-called davit-launch life rafts. Such equipment comprise gas-inflatable life rafts that can be launched into the sea from the ship by means of a hoist (davit). Typically, a life raft comprises two superimposedly adjoined, gas-inflatable, circular float chambers, a double bottom attached to the lower rim of the lower one of the circular float chambers and a support pillar or arch which is adapted to support the raft roof if any and to which the guys and similar elements are attached. The guys and similar elements are conventionally attached at their one ends to the outer rim of the circular float chamber of the raft and at their other ends to a shackle or similar fixing element on the support pillar or arch. The support pillar or arch are also formed by gas-inflatable chambers.

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When the life rafts of the above-described type are being launched, they will be automatically inflated while still hanging on the davit's hook, the rafts are boarded by people and launched into the sea, whereby the hook is released and the raft is allowed to float away from the distressed ship. Conventional life rafts are designed with a construction that imparts them maximum stability under wind and at rough sea. For this purpose the rafts are provided with, e.g., different ballast arrangements that prevent the raft from toppling. Such ballast can be formed by, e.g., water pockets adapted to the raft rims, whereby the number of the pockets may be from 6 to 8, for

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instance, with a volume of 100 l typical for each pocket. The ballast water pockets become filled with seawater and thus tend to keep the raft steady in the sea. Moreover, the adherence of the raft bottom and rims to the sea surface provides a downward suction effect stabilizing the movements of the raft.

Conventional life rafts have proven problematic therein that they cannot be utilized for elevating people adrift to a rescuing vessel. For instance, in conjunction with the sinking disaster of m/s Estonia it was found that rescuing vessels with high sides (more than 4.5 m high) could not but follow helpless the drowning of people adrift in the sea. With the help of a hoist, from the rescuing vessels into the sea was launched a life raft of the above-described davit-launch type. At the hoisting of the life raft up from the sea, the downward suction effect caused by the raft bottom adhering to the sea surface and excessively forceful hoisting of the raft damaged the structure of the raft. In such an unsuccessful hoisting operation, two people were drowned.

It is an object of the present invention to achieve an entirely novel type of life raft that is hoistable from the sea safely with all people being rescued still aboard the raft.

The invention is characterized in what is stated in the annexed claims.

The invention offers a number of significant benefits. Owing to the construction of the raft bottom, it can be easily hoisted from the sea, because the bottom of the raft is free from the downward suction effect. Thus, a viable solution is provided for need of safely hoisting people adrift in a raft away from the sea to the rescue vessel. By adapting the raft bottom at a distance from

the lower rim of the lower float chamber, the people aboard the raft are kept dry  
 5 and the downward suction by the sea surface is minimised. An advantageous  
 construction in terms of commercial production is attained by mounting the raft  
 bottom in a bridging manner between the float chambers. Division of the raft  
 bottom into a plurality of zones, e.g., according to the openings of the raft  
 10 optimises the properties of each zone. Then, e.g. the sitting area close to the  
 float chambers may have smaller openings than the other zones of the raft  
 bottom. The location of the raft is improved by making the raft brightly coloured,  
 whereby people adrift can easier see the floating raft. Boarding the raft by  
 people is aided by virtue of arranging ramps to the outer rim of the raft.

15 In the following the invention will be examined with reference to the appended  
 drawings, in which:

Figure 1 is a schematic partially sectional side view of an embodiment  
 of the life raft according to the invention;

20 Figure 2 is a schematic top view of an embodiment of the life raft  
 according to the invention; and

Figure 3 is a schematic partially sectional side view of another  
 embodiment of the life raft according to the invention.

Referring to figures, the life raft illustrated therein comprises at least one annular,  
 25 inflatable float chamber 1,2 suited for filling with a gas. Thus, the float chambers  
 are arranged conventionally inflatable with gaseous medium released from, e.g.  
 a container filled with compressed CO<sub>2</sub> gas. Advantageously, the number of the  
 float chambers 1,2 is at least two, whereby the raft still is kept afloat by virtue of  
 one chamber in the case that the other chamber will be punctured. Mounted at a  
 30 distance upward from the lower rim of the lower chamber 1, bridging the inner  
 circumference of the annular float chamber, is a raft bottom 3. The raft bottom 3  
 is most advantageously spanned by adhesive bonding between the float  
 chambers 1,2, whereby a raft construction is attained that can be  
 advantageously manufactured. To the bottom 3 are made a number of openings  
 35 principally serving to prevent the downward suction caused by the adherence of  
 the raft bottom to the surface of the sea when the raft is being hoisted to the  
 rescue vessel. Furthermore, water possibly entering the floating raft can escape  
 via the openings provided to the raft bottom. The bottom can be made from, e.g.

a single piece with prefabricated openings of desired size.

- 5 Alternatively, the bottom may be partly or entirely made from a meshed material. Now referring to Fig.2, the bottom shown therein is made from two different materials, of which the centre part 9 is comprised of a mesh and the sitting bench area 10 closest to the float chamber 2 can be made, e.g. from a fabric of finer mesh. The meshed part 9 may be e.g. a net made from interweaved strips or belts. Such a meshed part 9 is then attached to the inner rim of the sitting area 10 by means of e.g. adhesive bonding and/or sewing. The width of the sitting area 10 may extend, e.g. 0.3-1m radially from the inner rim of the float chamber 1 toward the centre of the raft. The number, shape and size of openings made to the bottom of raft may be varied widely.

- 1 5 In a typical design of the raft, the diameter of the openings is in the order of 20-100mm. The centre part 9 of the raft bottom 3 and the sitting area 10 may be provided with openings of different size and/or density. Advantageously, the sitting area 10 is provided with smaller openings than the centre part 9.

- 2 0 The life raft incorporates a support pillar 4 which also is gas-inflatable by means of gas introduced from e.g. the float chamber 2 via a communicating fill hose 11. The top of the support pillar 4 is equipped with a lift member 7 such as a shackle or similar fixture. The raft is launched into the sea and hoisted up therefrom by attaching the hook of a davit or similar hoisting means to the lift member 7.

- 2 5 The raft is equipped with a number of guy strips 5, 6 or equivalent elements that stiffen the raft structure particularly during launching and hoisting. The guy strips 5 are adapted along the outer rim of the raft properly outspaced from each other, whereby their one ends are attached to the shackle 7 on the support pillar and their other ends to the annular float chamber 1,2 of the raft by means of reinforced attachments or similar means. The number of the guy strips may vary, e.g. from 2 to 20 depending on the size of the raft. Also the bottom 3 of the raft may be connected via guy strips or similar elements to the shackle 7 on the support pillar. Such elements particularly serve to support the bottom of the raft during the hoisting of the raft with the people aboard the raft.



- 5 To the outer rim of the life raft, advantageously at the float chamber 1, is adapted at least one ramp 8 for aiding the boarding of a person adrift from the sea into the raft. Also the boarding ramps 8 are advantageously gas-inflatable. The number of the ramps may be from 4 to 6 depending on the size of the raft. However, the ramps must be located so that the side of the raft intended to abut the side of the rescue vessel has no ramp.
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- Advantageously, the colour of the float chambers 1, 2 is bright and easy to spot. Such a colour is e.g. a fluorescent colour such as fluorescent red, green or yellow. Then the people adrift to be rescued can easier locate the raft and seek toward it.
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Advantageously, the hoistable raft according to the invention has no roof. This property facilitates unobstructed view from above, e.g., from the rescue vessels onto the persons to be rescued.

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The support pillar of the hoistable raft may also be designed to form an arch 12 (Fig. 3), whereby the ends of the arch are attached to the float chamber 2 at, e.g., opposite sides of the raft, whereby the lift member 7  
10 such as a shackle is adapted to the top center of the support arch. Then, the raft can be hoisted from the shackle mounted at the top center of the support arch.

When permitted by authorities, the hoistable raft accord-  
15 ing to the invention may also be hoisted by a helicopter.

The hoistable raft according to the invention can be equipped with accessories such as floating rings (life-  
savers) with a connecting lifeline per each ring. The  
20 number lifesavers should be at least 8 per raft. Two sufficiently long and strong lifelines should be provided for mooring the raft to the rescue vessel so that the raft can be moved.

25 The raft according to the invention is most appropriately stored deflated in a conventional protective capsule similar to that used for prior-art gas-inflatable life rafts. As the hoistable raft is launched/inflated in the same fashion as a prior-art davit-launch life raft, no  
30 special training of the ship's personnel is required for the use of the life raft according to the invention.

To those versed in the art it is obvious that the inven-  
tion is not limited by the exemplifying embodiments  
35 described above, but rather, may be varied within the scope and spirit of the annexed claims.

## THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A life raft comprising at least one gas-inflatable, annular float chamber (1,2), a raft bottom (3) and means for launching the raft into the sea and hoisting it there-from, characterised in that said raft bottom (3) equipped with openings is adapted to bridge the inner circumference of the float chamber (1,2), advantageously at a distance upward from a lower rim of float chamber (1).
2. A life raft as defined in claim 1, characterised in that said bottom (3) is adapted between said float chambers (1,2), wherein said float chambers (1,2) are superimposed.
3. A life raft as defined in claim 1 or 2, characterised in that said bottom (3) comprises a sitting area (9) and a centre area (10).
4. A life raft as defined in any of foregoing claims 1-3, characterised in that the raft is provided with a conventional support pillar (4) or a support arch (12), whereby a lift member (7) adapted to said pillar or arch makes it possible to hoist the raft from the sea or launch it into the sea.
5. A life raft as defined in any of foregoing claims 1-4, characterised in that the raft is provided with a plurality of guy strips (5,6) or similar elements.
6. A life raft as defined in any of foregoing claims 1-5, characterised in that the material of the life raft, particularly of its float chambers (1,2) is a bright-coloured, advantageously fluorescent coloured material.
7. A life raft as defined in any of foregoing claims 1-6, characterised in that a plurality of boarding ramps (8) are adapted to the outer circumference of the life raft, advantageously to the outer rim of the float chamber (1).
8. A life raft as defined in any of foregoing claims 1-7, characterised in that an area free from boarding ramps (8) is arranged to the outer circumference of the life raft.

9. A life raft as defined in any of foregoing claims 1-8, characterised in that centre area (9) of the bottom (3) and sitting area (10) are provided with openings of different size and/or density.

5 10. A life raft as defined in any of foregoing claims 1-9, characterised in that at least a portion of the area of the raft bottom (3) is made from a meshed material.

11. A life raft substantially as herein before described with reference to the accompanying drawings.

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Dated this 9th day of November 1998

15 MICHAEL TOM BLOMQUIST  
By his Patent Attorneys,  
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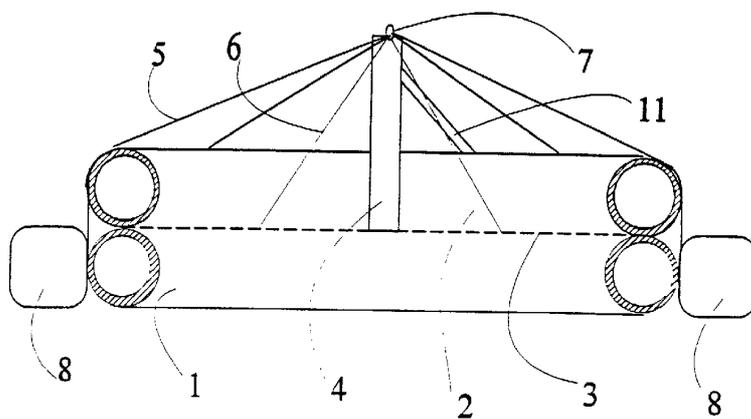
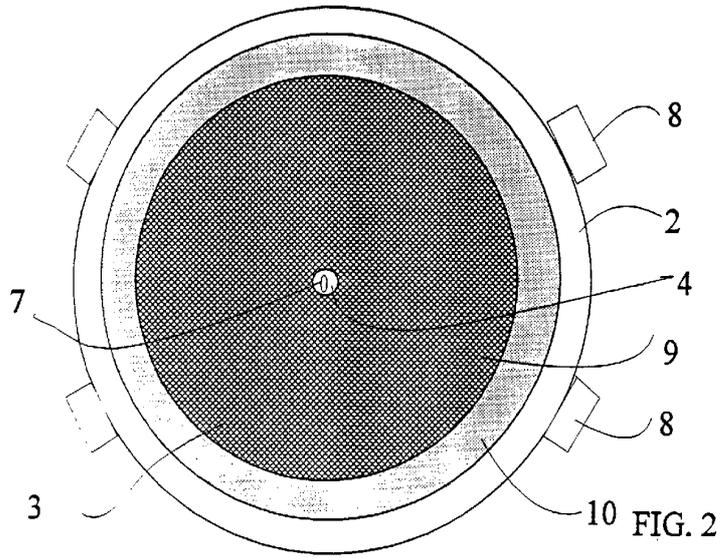


FIG. 1

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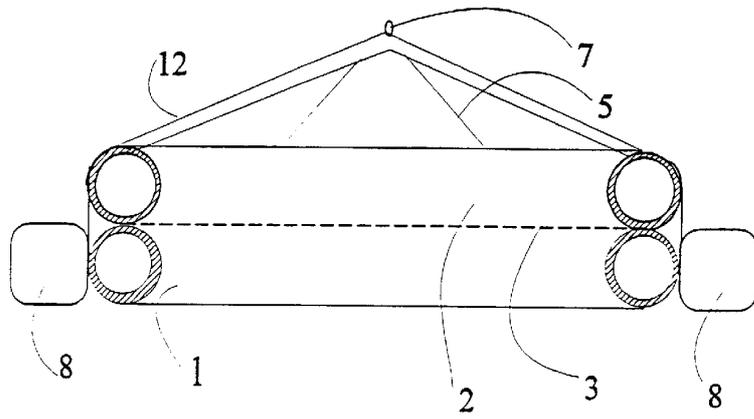


FIG. 3