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(54) **LIFERAFT SYSTEM**

RETTUNGSINSELSYSTEM

SYSTEME DE RADEAU DE SAUVETAGE

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Description

Technical field of the invention

[0001] The present invention relates to a liferaft system comprising a container containing an inflatable liferaft and means for inflating the liferaft by means of an inflating gas, preferably carbon dioxide or a mixture of gases.

Background art

[0002] Inflatable liferafts enclosed in the self-opening containers are well known and are used as mandatory life-saving equipment throughout the world on almost any commercial ship and vessel.

[0003] The liferaft is inflated with an inflation gas preferably carbon dioxide from a gas cylinder. The gas cylinder is attached to the liferaft, and the gas is distributed from the cylinder into the inflatable chambers. Depending on the type and size of the liferaft there will be one or more gas cylinders connected to the liferaft. Furthermore, the gas from one cylinder can be distributed to one or more inflation inlets on the liferaft.

[0004] As the carbon dioxide is vented from the gas cylinder into the liferaft, expansive cooling occurs, which can result in the formation of carbon dioxide "snow", thus creating localised temperature below -40 DEG C. At this temperature, the inflatable chamber fabric freezes, loses its flexibility and the inflation time will depend on how fast this temperature can be raised. It is well known to try to solve the carbon dioxide snow formation by different types of gas inlet nozzles, adapted to trap or prevent carbon dioxide snow formation.

[0005] Furthermore, an apparatus has been provided to alleviate the problem caused when cold inflation gases impact inflation chamber surfaces. One such apparatus is an elongated, porous sleeve having a longitudinal passage and a side opening. The sleeve is positioned over the gas inlet valve with the outlet openings within the side opening of the sleeve. Gas emanating from the outlet openings passes axially through the longitudinal passage toward either end of the sleeve, and is dispersed through the sleeve material into the inflation chamber.

[0006] It is furthermore well-known to solve the problem associated with the fast evaporation of the carbon dioxide liquid from the cylinder and thereby carbon dioxide snow formation that for the desired evaporation, heat should be conveyed from the surroundings. It is well-known that if the entire amount of inflation gas is let in at only a single inlet there will be a high risk of insufficient heat supply to that place. The inlet may end up as one big ice lump, from which the gas will be only slowly generated. If, on the other hand, the gas liquid is supplied to several different areas, many times, more heat can then be attracted from the close surroundings to the total amount of the supplied gas, and it is then practically possible to get down the prescribed, relative brief inflation times, e.g. three minutes for a large size life raft, even

with the use of a single gas cylinder.

[0007] All the above mentioned solutions on the carbon dioxide snow formation all more or less depend on the heat from the surroundings, and they all more or less try to solve the problem by increasing the gas contact area. All the above mentioned solutions depend on the ambient temperature, and this is a problem when the liferaft has to be inflated in surroundings with low temperature e.g. below -30 DEG C.

[0008] Liferaft systems placed on ships or vessels sailing in low temperature area have furthermore problems with icing up of the container. If the container is iced up, there will be a risk that the release system does not function. The crew tries to overcome this problem by covering the container with anti ice liquids and by scraping the container free of ice, with the risk that the container will be damaged. From GB1267658 a prior art system is known, in accordance with the preamble of claim 1.

[0009] Thus, there is a need for providing a flexible solution to the above-mentioned disadvantages.

Summary of the invention

[0010] An object of the present invention is to wholly or partly overcome the above disadvantages and drawbacks of the prior art. More specifically, it is an object to provide a liferaft system with fast inflation and minimise the carbon dioxide snow formation.

[0011] It is also an object of the present invention to provide a liferaft system which will not be covered with ice.

[0012] The above objects, together with numerous other objects, advantages and features, which will become evident from the below description, are accomplished by a solution in accordance with the present invention where the container furthermore contains means for heating the system. By a system with heating means it is possible to minimise or avoid carbon dioxide snow, and it will furthermore be possible to avoid that the container will be covered by ice.

[0013] The term "liferaft" has in this application the meaning inflatable, lifesaving equipment such as liferaft, platform and dinghy.

[0014] The system can be provided with heated gas. The heated gas can e.g. be blown into the container. Preferably, the gas is a dry heated gas e.g. air.

[0015] The system according to the invention as defined by claim 1 comprises electric heating cables. The heating cables can be placed inside the container in one or both container parts; the electric heating cables can furthermore be isolated from the liferaft. Another embodiment according to the invention is to cast or embed the electric cables into the container parts.

[0016] The system according to the invention as defined by claim 2 comprises one or more heating mats. The heating mat is heated with electricity. An electric heated mat can be provided with cables running forwards and backwards inside the mat.

[0017] The system according to the invention can furthermore be provided with electric heating cables uniformly distributed in channels on one side of the mat.

[0018] The electric cables according to the invention can furthermore be cast or embedded into one or more elastic mats.

[0019] The elastic material can be a plastic material or a rubber, e.g. a silicone rubber.

[0020] A system according to the invention can furthermore be provided with one or more mats which wholly or partly encircle the liferaft.

[0021] The system according to the invention has an openable container to allow deployment of the liferaft, said openable container consists of at least two container parts.

[0022] The system according to the invention can furthermore be provided with one or more heating mats placed in the container parts.

[0023] The mats can furthermore be attached to the inside of the container parts e.g. with two-sided tape.

Brief description of the drawings

[0024] The invention and its many advantages will be described in more details below with reference to the accompanying schematic drawing, which for the purpose of illustration shows one non-limiting embodiment.

[0025] Fig. 1 shows schematically a view down in a container with a heating mat.

[0026] The figure is highly schematic and not necessarily to scale, and it shows only parts which are necessary in order to elucidate the invention, other parts being omitted or merely suggested.

Description of preferred embodiments

[0027] In Fig. 1, an embodiment of the liferaft system is shown schematically with only one part of the container and without the liferaft and the gas cylinder. The means for heating are shown schematically in a diagonally downward view. In the embodiment, one part of the container 1 is shown with heating mats 2 attached to the inside of the container part 1. In the shown embodiment, three mats are attached to the inside of the container. The three mats are placed parallel and the mats are connected in series to each other. A not shown temperature relay is connected with the mats and secures that the liferaft system is not overheated. In the showed embodiment, the three mats are connected in series to an electric power station outside the container and not shown on the figure. The electric mats and power cables are protected against water. In the figure, only one part of the container is shown, but the other part can as well be heated with electric heated mats. The electric supply cable from the container to the power station is connected with a well known hydrostatic release unit e.g. a Hammer release unit. This unit secures that the liferaft can float freely in relation to the heat power station in case the

ship or the vessel goes down. The heating mats are preferably made of an elastic material. In the shown embodiment, an electric heating wire is cast or embedded into a silicone mat.

[0028] In a merely illustrative, non-limiting embodiment, the system may comprise a dehumidifier/heater. The dehumidifier/heater is adapted to dehumidify as well as heat a gas to a predetermined temperature, wherein after said dehumidified and heated gas is led to the container and is being used for heating the system. Preferably, the gas is air.

[0029] Furthermore, the container may comprise an inlet for the dehumidified and heated gas as well as an outlet, for discharging excess air. Said inlet and outlet may comprise valve means.

[0030] Although the invention above has been described in connection with preferred embodiments of the invention, it will be evident for a person skilled in the art that several modifications are conceivable without departing from the invention as defined by the following claims.

Claims

1. A liferaft system comprising a container (1) containing an inflatable liferaft and means for inflating the liferaft by means of an inflating gas, preferably carbon dioxide or a mixture of gases, the container (1) being openable to allow deployment of the liferaft, said openable container (1) consists of at least two container parts, wherein the container (1) contains means (2) for heating the system, **characterised in that** the means (2) for heating comprises electric heating cables placed inside the container (1), **in that** the electric heating cables are connected to an electric supply cable that is configured to run from the container (1) to a power station outside the container, and **in that** the electric supply cable is connected with a hydrostatic release unit.
2. A liferaft system comprising a container (1) containing an inflatable liferaft and means for inflating the liferaft by means of an inflating gas, preferably carbon dioxide or a mixture of gases, the container (1) being openable to allow deployment of the liferaft, said openable container (1) consists of at least two container parts, wherein the container (1) contains means (2) for heating the system, **characterised in that** the means (2) for heating comprises one or more electrically heated mats placed inside the container (1), **in that** the one or more electrically heated mats are connected to an electric supply cable that is configured to run from the container (1) to a power station outside the container, and **in that** the electric supply cable is connected with a hydrostatic release unit.
3. A system according to claim 1, wherein the heating

cables are placed inside the container in one or both container parts.

4. A system according to claim 1 or 3, wherein the electric heating cables are isolated from the liferaft. 5
5. A system according to claim 1, wherein the electric cables are casted or embedded into the container parts. 10
6. A system according to claim 2, wherein the electric heated mat is provided with cables running forwards and backwards inside the mat.
7. A system according to claim 2, **characterised in that** the mat is provided with electric heating cables uniformly distributed in channels on one side of the mat. 15
8. A system according to claim 1, **characterised in that** the electric heating cables or electric heating wire are cast or embedded into one or more elastic mats. 20
9. A system according to claim 8, **characterised in that** the elastic material is a plastic material or a rubber, preferably a silicone rubber. 25
10. A system according to any one of the claims 2, 6, 7, 8 or 9, **characterised in that** the mat(s) wholly or partly encircle(s) the liferaft. 30
11. A system according to claim 2, **characterised in that** one or more heating mats are placed in the container parts.
12. A system according to claim 11, **characterised in that** the mats are attached to the container parts. 35

Patentansprüche

1. Rettungsfloßsystem, das einen Behälter (1) umfasst, der ein aufblasbares Rettungsfloß enthält sowie ein Mittel zum Aufblasen des Rettungsfloßes mittels eines Aufblasgases, bevorzugt Kohlendioxid oder eine Mischung von Gasen, wobei der Behälter (1) geöffnet werden kann, um das Entfalten des Rettungsfloßes zu gestatten, und wobei der zu öffnende Behälter (1) wenigstens aus zwei Behälterteilen besteht, wobei der Behälter (1) ein Mittel (2) zum Beheizen des Systems umfasst, **dadurch gekennzeichnet, dass** das Mittel (2) zum Beheizen elektrische Heizkabel umfasst, die im Inneren des Behälters (1) angeordnet sind, dadurch, dass die elektrischen Heizkabel mit einem elektrischen Versorgungskabel verbunden sind, das dafür eingerichtet ist, vom Behälter (1) zu einer Stromversorgungsstation außerhalb des Behälters zu führen, und dadurch, dass das elektrische Versorgungskabel mit

einer hydrostatischen Freigabeeinheit verbunden ist.

2. Rettungsfloßsystem, das einen Behälter (1) umfasst, der ein aufblasbares Rettungsfloß enthält sowie ein Mittel zum Aufblasen des Rettungsfloßes mittels eines Aufblasgases, bevorzugt Kohlendioxid oder eine Mischung von Gasen, wobei der Behälter (1) geöffnet werden kann, um das Entfalten des Rettungsfloßes zu gestatten, und wobei der zu öffnende Behälter (1) wenigstens aus zwei Behälterteilen besteht, wobei der Behälter (1) ein Mittel (2) zum Beheizen des Systems umfasst, **dadurch gekennzeichnet, dass** das Mittel (2) zum Beheizen eine oder mehrere elektrisch beheizte Matten umfasst, die innerhalb des Behälters angeordnet sind, dadurch, dass die eine oder mehreren elektrisch beheizten Matten mit einem elektrischen Versorgungskabel verbunden sind, das dafür eingerichtet ist, vom Behälter (1) zu einer Stromversorgungsstation außerhalb des Behälters zu führen, und dadurch, dass das elektrische Versorgungskabel mit einer hydrostatischen Freigabeeinheit verbunden ist.
3. System nach Anspruch 1, wobei die Heizkabel innerhalb des Behälters in einem oder in beiden Behälterteilen angeordnet sind.
4. System nach Anspruch 1 oder 3, wobei die elektrischen Heizkabel vom Rettungsfloß isoliert sind.
5. System nach Anspruch 1, wobei die elektrischen Kabel in den Behälterteilen eingegossen oder eingebettet sind.
6. System nach Anspruch 2, wobei die elektrisch beheizte Matte mit Kabeln ausgestattet ist, die innerhalb der Matte vor und zurück laufen.
7. System nach Anspruch 2, **dadurch gekennzeichnet, dass** die Matte mit elektrischen Heizkabeln ausgestattet ist, die auf einer Seite der Matte gleichmäßig in Kanälen verteilt sind.
8. System nach Anspruch 1, **dadurch gekennzeichnet, dass** die elektrischen Heizkabel oder elektrischen Heizdrähte in eine oder mehrere elastische Matten eingegossen oder eingebettet sind.
9. System nach Anspruch 8, **dadurch gekennzeichnet, dass** das elastische Material ein Kunststoffmaterial oder ein Gummi, vorzugsweise Silikongummi, ist.
10. System nach einem der Ansprüche 2, 6, 7, 8 oder 9, **dadurch gekennzeichnet, dass** die Matte(n) das Rettungsfloß vollständig oder teilweise umgibt/umgeben.

11. System nach Anspruch 2, **dadurch gekennzeichnet, dass** in den Behälterteilen eine oder mehrere Heizmatten angeordnet sind.
12. System nach Anspruch 11, **dadurch gekennzeichnet, dass** die Matten an den Behälterteilen befestigt sind.

Revendications

1. Système de radeau de survie comprenant un conteneur (1) contenant un radeau de survie gonflable et un moyen pour gonfler le radeau de survie au moyen d'un gaz de gonflage, de préférence du dioxyde de carbone ou un mélange de gaz, le conteneur (1) pouvant être ouvert pour permettre le déploiement du radeau de survie, ledit conteneur pouvant être ouvert (1) consiste en au moins deux parties de conteneur, dans lequel le conteneur (1) contient un moyen (2) pour chauffer le système, **caractérisé en ce que** le moyen (2) pour chauffer comprend des câbles de chauffage électrique placés à l'intérieur du conteneur (1), **en ce que** les câbles de chauffage électrique sont connectés à un câble d'alimentation électrique qui est configuré pour aller du conteneur (1) vers une centrale électrique à l'extérieur du conteneur, et **en ce que** le câble d'alimentation électrique est connecté à une unité de largage hydrostatique. 30
2. Système de radeau de survie comprenant un conteneur (1) contenant un radeau de survie gonflable et un moyen pour gonfler le radeau de survie au moyen d'un gaz de gonflage, de préférence du dioxyde de carbone ou un mélange de gaz, le conteneur (1) pouvant être ouvert pour permettre le déploiement du radeau de survie, ledit conteneur pouvant être ouvert (1) consiste en au moins deux parties de conteneur, dans lequel le conteneur (1) contient un moyen (2) pour chauffer le système, **caractérisé en ce que** le moyen (2) pour chauffer comprend un ou plusieurs tapis électriquement chauffés placés à l'intérieur du conteneur (1), **en ce que** les uns ou plusieurs tapis électriquement chauffés sont connectés à un câble d'alimentation électrique qui est configuré pour aller du conteneur (1) vers une centrale électrique à l'extérieur du conteneur, et **en ce que** le câble d'alimentation électrique est connecté à une unité de largage hydrostatique. 50
3. Système selon la revendication 1, dans lequel les câbles de chauffage sont placés à l'intérieur du conteneur dans une ou les deux parties de conteneur. 55
4. Système selon la revendication 1 ou 3, dans lequel les câbles de chauffage électrique sont isolés du radeau de survie.

5. Système selon la revendication 1, dans lequel les câbles électriques sont coulés ou encastrés dans les parties de conteneur.
6. Système selon la revendication 2, dans lequel le tapis électriquement chauffé est muni de câbles allant vers l'avant et vers l'arrière à l'intérieur du tapis.
7. Système selon la revendication 2, **caractérisé en ce que** le tapis est muni de câbles de chauffage électrique uniformément distribués dans des canaux sur un côté du tapis. 10
8. Système selon la revendication 1, **caractérisé en ce que** les câbles de chauffage électrique ou le fil de chauffage électrique sont coulés ou encastrés dans un ou plusieurs tapis élastiques. 15
9. Système selon la revendication 8, **caractérisé en ce que** le matériau élastique est un matériau plastique ou un caoutchouc, de préférence un caoutchouc de silicone. 20
10. Système selon l'une quelconque des revendications 2, 6, 7, 8 ou 9, **caractérisé en ce que** le(les) tapis(s) encercle(nt) totalement ou partiellement le radeau de survie. 25
11. Système selon la revendication 2, **caractérisé en ce que** un ou plusieurs tapis de chauffage sont placés dans les parties de conteneur. 30
12. Système selon la revendication 11, **caractérisé en ce que** les tapis sont fixés aux parties de conteneur. 35

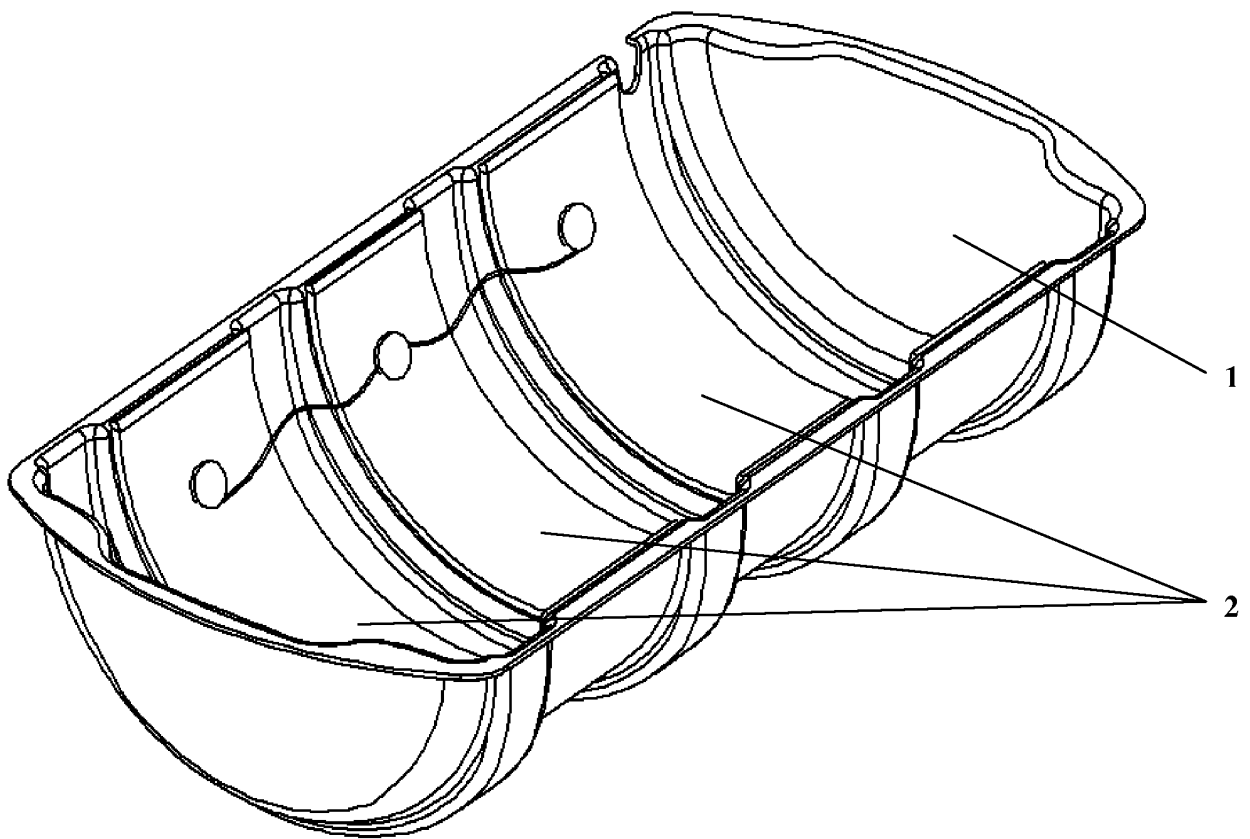


Fig.1

REFERENCES CITED IN THE DESCRIPTION

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