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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

REPLY TO
ATTN OF: GP

JAN 21 1974

TO: KSI/Scientific & Technical Information Division
Attention: Miss Winnie M. Morgan

FROM: GP/Office of Assistant General Counsel for
Patent Matters

SUBJECT: Announcement of NASA-Owned U.S. Patents in STAR

In accordance with the procedures agreed upon by Code GP and Code KSI, the attached NASA-owned U.S. Patent is being forwarded for abstracting and announcement in NASA STAR.

The following information is provided:

U.S. Patent No. : 3,781,933

Government or Corporate Employee : Government

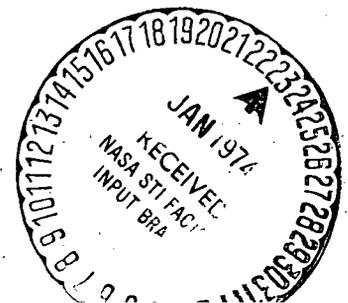
Supplementary Corporate Source (if applicable) : _____

NASA Patent Case No. : LAR-10241-1

NOTE - If this patent covers an invention made by a corporate employee of a NASA Contractor, the following is applicable:
Yes No

Pursuant to Section 305(a) of the National Aeronautics and Space Act, the name of the Administrator of NASA appears on the first page of the patent; however, the name of the actual inventor (author) appears at the heading of column No. 1 of the Specification, following the words ". . . with respect to an invention of . . ."

Elizabeth A. Carter
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Enclosure
Copy of Patent cited above



N74-14845
Unclass 26241
00/05
CSCS 06K
(NASA-Case-LAR-10241-1) MODIFICATION OF ONE MAN LIFE RAFT Patent (NASA) 4 P.

[54] **MODIFICATION OF ONE MAN LIFE RAFT**
 [75] Inventor: Ernest J. Soter, Newport News, Va.
 [73] Assignee: The United States of America as represented by the Administration of the National Aeronautics and Space Administration, Washington, D.C.

1,048,186 7/1953 France..... 9/11
 1,215,295 4/1960 France..... 9/11

Primary Examiner—George E. A. Halvosa
 Assistant Examiner—Gregory W. O'Connor
 Attorney—Howard J. Osborn et al.

[22] Filed: Oct. 29, 1971

[57] **ABSTRACT**

[21] Appl. No.: 193,672

[52] U.S. Cl. 9/11 A
 [51] Int. Cl. B63c 9/04
 [58] Field of Search 9/2 A, 11 A;
 114/16.5, 117, 173, 174; 61/81, 69 R

A life raft, preferably of the one-man inflatable type wherein an inflatable tube perimetrically bounds an occupant receiving space having a flexible floor member, includes a zippered opening in the floor to be used for entry, thus avoiding the necessity of climbing over the peripheral tube, and facilitating the use of a constant diameter tube as opposed to conventional tubes tapered at one end to facilitate boarding over the side. An airtight fabric bulkhead divides the peripheral tube longitudinally into two inflatable tube sections, whereby if either tube section were punctured, the bulkhead would move into the punctured section to substitute for the punctured wall portion and maintain the inflatable volume of the tube. The floor member is preferably attached to the central portion of the tube wall so that either side of the raft can be the "up" side.

[56] **References Cited**

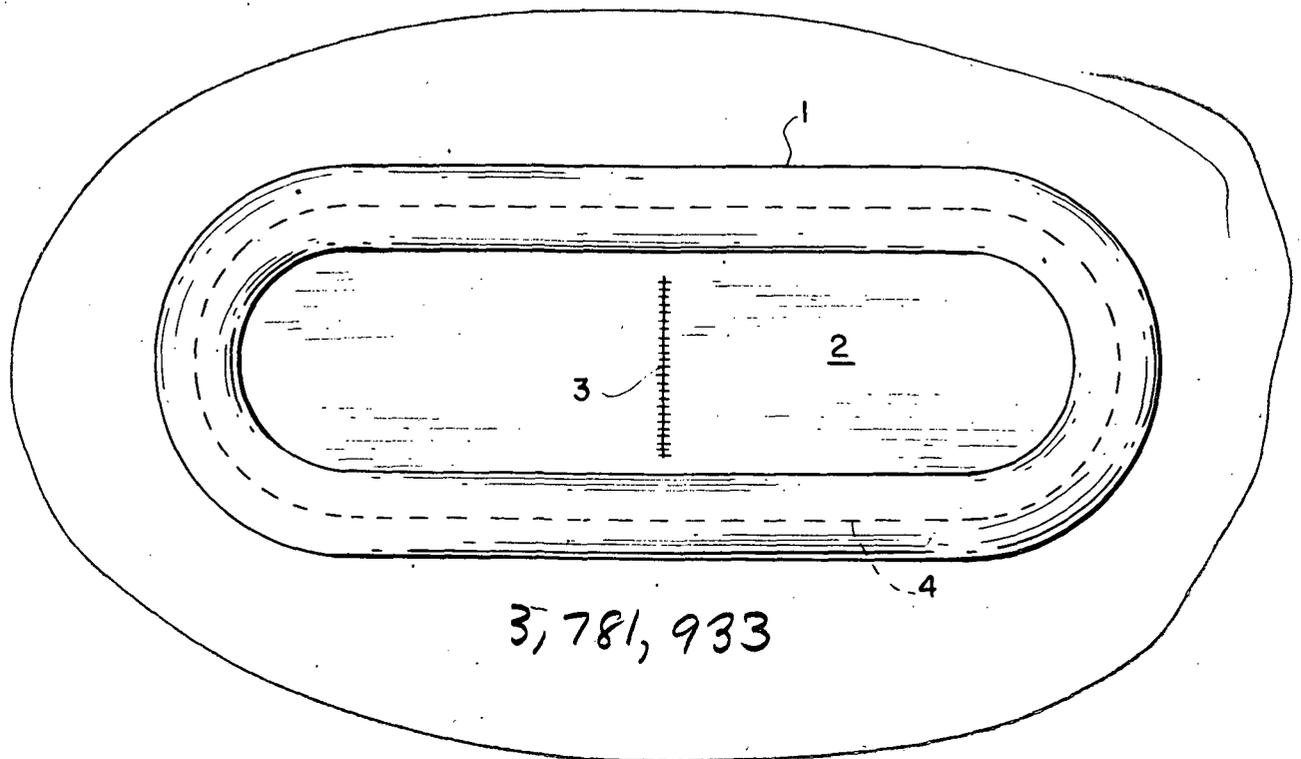
UNITED STATES PATENTS

2,399,494	4/1946	Manson et al.	9/2 A X
2,403,436	7/1946	Heigis	9/11 A X
3,682,123	8/1972	Edwards	9/2 A X
2,962,732	12/1960	Marz	9/2 A
3,131,406	5/1964	Cousteau et al.	9/11 A
3,299,645	1/1967	Link	9/8 R
3,072,930	1/1963	Fraebel	9/11 A

FOREIGN PATENTS OR APPLICATIONS

420,737	10/1925	Germany	9/11
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7 Claims, 2 Drawing Figures



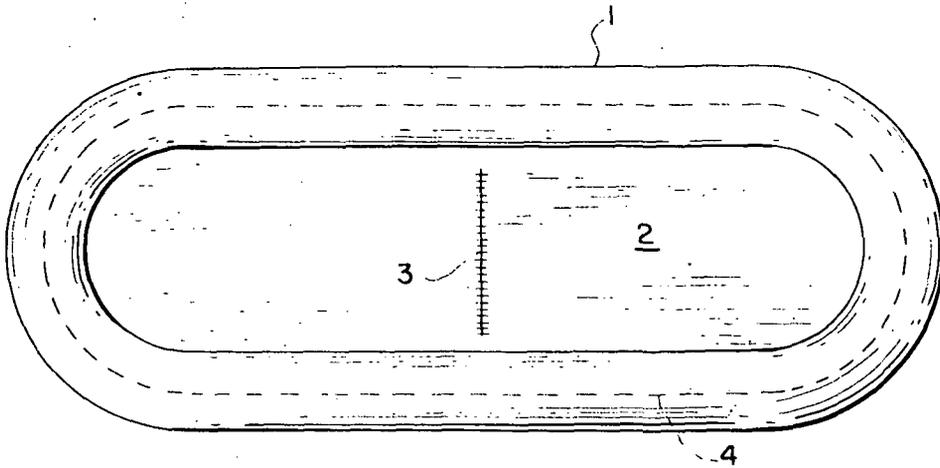


FIG. 1

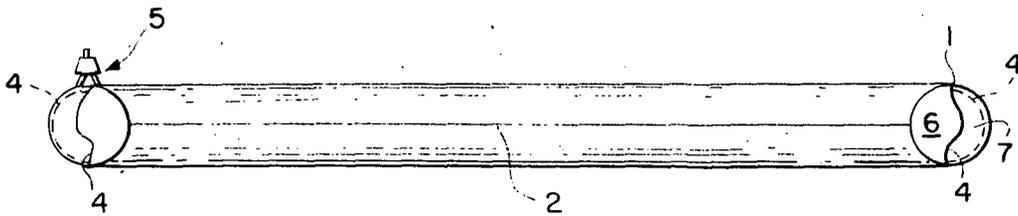


FIG. 2

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MODIFICATION OF ONE MAN LIFE RAFT

The invention described herein was made by an employee of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

FIELD OF THE INVENTION

This invention relates to life rafts, preferably of the one-man inflatable type, and particularly to such rafts having an improved boarding feature and/or an improved arrangement for maintaining inflatability and flotation after a puncture of the main wall of the inflatable portion.

BACKGROUND AND SUMMARY OF THE INVENTION

Basically, the object of this invention is to improve existing life rafts, particularly of the one-man inflatable type, so as to make them more dependable, simpler to use, and of simpler and more economical construction.

The conventional one-man inflatable life raft comprises an inflatable tube configured in the form of a closed loop such that, when inflated, the tube perimetrically bounds an occupant receiving space floored by a floor member of flexible material connected with the inflatable tube. The raft is boarded from the water by climbing over the inflated tube, and the tube commonly is tapered in diameter toward one end so as to facilitate boarding at that end. This tapered arrangement contributes to complexity of construction, and hence increased cost of manufacture, as opposed to a raft utilizing a constant diameter tube, but these disadvantages have been endured because of the easier boarding feature afforded by the tapered tube. Also, the floor member of such rafts often is attached tangentially to the tube, that is, to the extreme lower points of the tube, such that there is a definite top and bottom to the raft, thus causing the raft to have a restrictive "this side up" feature. Finally, it is perhaps conventional to subdivide the inflatable tube into separately inflatable, longitudinally adjacent sections such that flotation of a reduced degree is maintained after puncture of less than all the sections. In a somewhat analogous arrangement, such as shown in U.S. Pat. No. 3,105,981, separate upper and lower tubes are used. U.S. Pat. No. 3,072,930 discloses a different analogous arrangement of multiple tubes or tube sections.

An improved life raft in accordance with the instant invention includes a selectively openable and closable boarding opening in the floor member, whereby a downed pilot can board simply by pushing himself up through the floor opening, and, once aboard, the opening can be closed. This not only eliminates having to board by scrambling over the inflated tube, but it also eliminates the need for a special boarding area such as is provided by a tapered tube construction. By facilitating the use of a constant diameter tube, simplicity and economy of construction are inherently facilitated. In accordance with a further feature of the invention, the tube is divided longitudinally into laterally adjacent separately inflatable tube sections by a fabric bulkhead so located and dimensioned that it can move against either outer wall of the tube to substitute for that wall after a puncture, thus maintaining the inflatable volume of the tube. In the preferred embodiment, the bulkhead divides the tube into two equal tube sections

as viewed in lateral cross-section, and the extendable width of the bulkhead between its edge connections thus preferably is equal to one-half the tube circumference. In accordance with a further feature, although not an essential one, of the improved life raft, the floor member is attached at the mid-point or largest diameter of the tube rather than across the bottom, whereby to facilitate use with either side up.

Other and further advantages and features of the improved raft will be apparent from the ensuing description of a preferred embodiment taken in conjunction with the annexed drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view, generally schematic, of a life raft in accordance with the preferred embodiment.

FIG. 2 is a sectional elevation view taken generally along the longitudinal axis of the raft shown in FIG. 1, and illustrating exemplary normal and post-puncture positions of the fabric bulkhead.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, the raft in its preferred form is fabricated from conventional waterproof fabric, such as rubberized nylon, and comprises an inflatable loop-form tube 1 bounding an occupant receiving space. A flexible floor member 2 is connected to the tube preferably at its cross-sectional mid-point or point of largest diameter, and spans the occupant receiving space. A zippered access opening 3 (the zipper being operable from either side) is provided in floor member 2, extending in a beam-wise direction across substantially the entire floor, but optionally extendable longitudinally for approximately one-half the floor length. The tube preferably is of constant diameter. An air-tight fabric bulkhead 4 divides the tube 1 longitudinally into separately inflatable tube sections 6 and 7, and in the illustrated version the width (considered vertically) of the fabric bulkhead is equal to one-half the circumference of the tube. Thus, when one side or the other of the tube is punctured, the bulkhead will simply blow out or in from its normal position (shown in solid lines in FIG. 2) to bear against and replace the punctured tube wall, and maintain the inflatable volume of the tube, as indicated in broken lines in FIG. 2.

To facilitate separate inflation of tube sections 6 and 7, separate inflation tubes extend thereto from a simple selector valve 5 in the main inflation tube.

Various modifications of the illustrated embodiment may be made within the spirit and scope of the invention, the characteristic features of which are as set forth in the appended claims.

What is claimed is:

1. An inflatable life raft comprising an inflatable tube having a cross section defining at least an inner arc configured in the form of a closed loop such that when inflated the tube perimetrically bounds an occupant receiving space, a floor member of flexible material connected with said inflatable tube continuously along a line corresponding substantially to the mid-point of the inner arc of the tube when inflated and forming a floor for said occupant receiving space, said occupant receiving space being defined on either side of said floor member and means forming a selectively openable and closable access operable from either side of said floor members in said floor member of a size sufficiently

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large to readily pass a human body whereby to permit boarding said raft through said access opening in said floor member rather than over the inflated tube.

2. An inflatable life raft as claimed in claim 1 wherein said last mentioned means comprises an access opening in said floor member, and manually operable fastening means for opening and closing said access opening.

3. An inflatable life raft as claimed in claim 1 wherein said last mentioned means comprises a zippered opening in said floor member.

4. An inflatable life raft as claimed in claim 1 wherein said inflatable tube, in cross section, is of substantially constant diameter at all points along said closed loop.

5. An inflatable life raft as claimed in claim 4 wherein said floor member, at each point of connection is connected to said inflatable tube substantially at the midpoint of the inner arc of the tube wall when inflated.

6. An inflatable life raft as claimed in claim 5 further comprising an air-tight bulkhead of flexible material

inside said inflatable tube, extending along the length thereof, in a closed loop configuration and connected at its longitudinal edges to the inner wall of said tube so as to divide the tube into two inflatable tube sections, each of which is configured in the form of a closed loop, whereby a loss of air-tight integrity in one section does not affect the air tightness of the other section.

7. An inflatable life raft as claimed in claim 6 wherein the longitudinal edges of said bulkhead are connected to the inner walls of said tube along lines spaced circumferentially from each other by substantially one-half the circumference of the tube at any particular area of connection so as to divide the tube equally circumferentially, and wherein the width of said bulkhead between its longitudinal edges at any point along said closed loop is substantially equal to one-half the tube circumference at that point.

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