(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 403 912 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
21.11.2018 Bulletin 2018/47

(51) Int Cl.:
B63B 7/08 *(2006.01)*

(21) Application number: **18169877.0**

(22) Date of filing: **27.04.2018**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **17.05.2017 RU 2017117203**

(71) Applicant: **Golitsin, Aleksandr Borisovich**
Chelyabinskay obl., Snezhinsk 456770 (RU)

(72) Inventor: **Golitsin, Aleksandr Borisovich**
Chelyabinskay obl., Snezhinsk 456770 (RU)

(74) Representative: **Viering, Jentschura & Partner mbB**
Patent- und Rechtsanwälte
Am Brauhaus 8
01099 Dresden (DE)

(54) DEMOUNTABLE FLOORBOARD FOR INFLATABLE BOAT AND INFLATABLE BOAT HAVING THE SAME

(57) The present invention relates to small scale shipbuilding and can be used in design of a floorboard for inflatable boat. Technical results that the present invention addresses are reduction of labor input, simplification and facilitation of the procedure of inflatable boat floorboard assembly and disassembly, as well as enhancement of rigidity, strength and reliability of the floorboard. Said technical results are achieved by the fact that the demountable floorboard for inflatable boat comprises a front section (1), a central section (2) and a stern section (3), said sections are provided with connecting profiles (4) for releasable connection, whereby the central section (2) is composed of one or more tiers, each of which is made of segments shaped, when seen from above, as trapezoids. At that, the segments of central section tiers are made in such a way that the bases of said trapezoids are parallel to the symmetry axis of the floorboard when assembled.

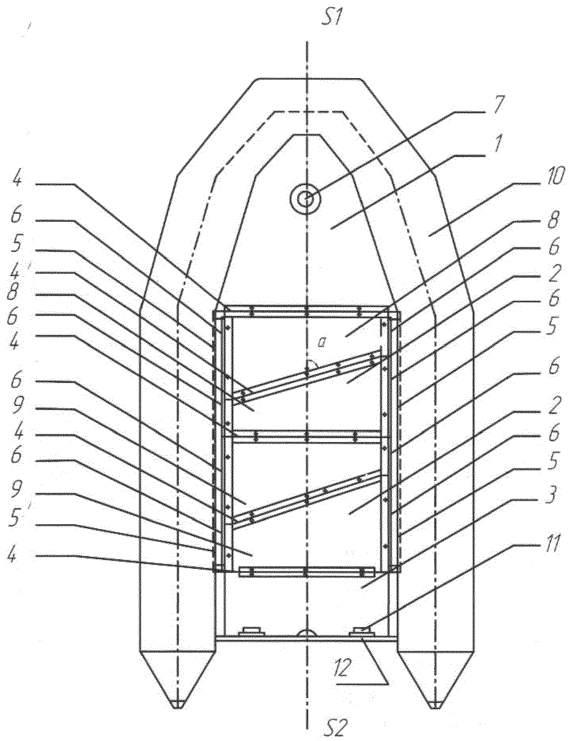

Fig. 1

EP 3 403 912 A1

Description

Field of the invention

[0001] The present invention relates to small scale shipbuilding and can be used in design of a floorboard for an inflatable boat, and to an inflatable boat having such a floorboard.

Background and prior art

[0002] The term "floorboard" means demountable flooring to be arranged in an inflatable boat on its bottom.

[0003] Floorboard (flooring) serves to add lengthwise and lateral rigidity to inflatable boat hull as well as to provide stable footing for passengers. Most of floorboards are made demountable, composed of sections positioned across the symmetry axis of the boat. Floorboard sections are made of plywood, aluminium alloy or polymer material. The floorboard is squeezed between the bottom of the boat and the inflated sides. (ref.: Korolev A.N., Zhokhov V.P. Inflatable boats. L.: Sudostroenie, 1989, pages.83-84).

[0004] Patent RU 136,413 U1 МПК B63B7/08, published 10.01.2014, discloses a design of an inflatable boat which includes a hull made of elastic material with inflatable sides that are interconnected by elastic bottom, lengthwise stringers and a demountable floorboard comprising a front section, a central section and a stern section, said sections are provided with connecting profiles for releasable connection, disposed perpendicular to longitudinal symmetry axis of the boat.

[0005] The boat disclosed in patent RU136413U1 can be disassembled using the following method only, which is determined by said floorboard design.

[0006] Boat sides are deflated. Wherein floorboard sections are released from the sides. Then lengthwise stringers and the floorboard sections are taken out and the boat hull is folded.

[0007] However, lengthwise stringers are not obligatory parts of inflatable boat design. In particular, patent RU 155,210 U1 МПК B63B7/08, published 27.09.2015 describes an inflatable boat design that includes a hull made of elastic material with inflatable sides interconnected by elastic bottom, and a demountable floorboard.

[0008] Technical problem which is typical for the known designs of inflatable boat floorboards is an impossibility of removing the front section, the central section and the stern section of the floorboard from an inflatable boat if boat sides are inflated.

[0009] Due to this problem the labor required for boat handling is increased, specifically for washing of external and internal surfaces of the bottom after the boat was used on the water.

[0010] Before setting the boat ashore for further transportation on the ground or storing, sand, dirt, mud, algae and other rubbish should be washed off the external and internal surfaces of the bottom as well as the sections of the floorboard. For this purpose, the floorboard sections must be removed from the boat before washing.

[0011] If, according to operational manuals for the known boats, one deflates the sides of the boat to remove the floorboard, the boat will have to be inflated again for cleaning purposes, as it is rather inconvenient to wash the boat with deflated sides.

[0012] The above technical problem also determines a strict order of actions a user should follow to assemble and disassemble an inflatable boat. A beginner, for example, can forget inserting the floorboard sections before inflating the sides of the boat, thus he/she will have to deflate the boat sides again to install the floorboard sections.

[0013] The design disclosed in patent RU 169,992 U1 МПК B63B7/08 published 11.04.2017 was taken as the closest prior art for the floorboard design of the present invention. Said floorboard comprises a front section, a central section and a stern section, said sections are provided with connecting profiles for releasable connection. Wherein, the central section comprises one or more tiers, each tier being made of segments shaped, when seen from above, as a rectangular trapezoid, whereby said segments are being interconnected at an acute angle to longitudinal symmetry axis of the floorboard, and the bases of said rectangular trapezoids are perpendicular to the symmetry axis of the floorboard when assembled.

[0014] A drawback of the closest prior art design is that the connecting profiles of the central segment sections have a slit at locations of joint of the central section tiers to each other as well as to the stern section and the front section, which is clearly seen in the drawings enclosed to the patent RU 169,992 U1. Therefore, the closest prior art is characterized by complexity of fastening the tiers of the central section both together and to the stern section and the front section, as the connection of the adjacent sections of the floorboard as such is performed by interconnection of three connecting profiles, that is, user has to connect the connecting profile of the front section, as well as the connecting profile of the stern section, with the transverse connecting profile of each of the segments of one tier of the central section. At the same time the connection of the two adjacent tiers of the central section is performed by simultaneous connection of four transverse connecting profiles, which apparently may result in more complexity and inconvenience for the user.

[0015] Furthermore, in inflatable boats the floorboard undergoes considerable loads from inflated sides, at that, the nature of inflatable boats and said typical floorboards is such, that the lateral loads from inflated sides normally exceed the longitudinal loads. In floorboard design known from prior art, the area of connection of two segments of one tier of central section is a weak point in terms of rigidity of the floorboard, as it is not able to withstand said lateral loads. This results in insufficient rigidity

and strength of the whole floorboard while the boat is moving along the waves or the user is walking on the floorboard. Moreover, in the worst case such connections may be broken, which also indicates insufficient strength and therefore reliability of such floorboards in the context of inflatable boats.

Summary of the invention

[0016] The object of the present invention is simplification of design of fastening the stern section and the front section to the segments of the central section of the floorboard with simultaneous increase of its rigidity, strength and reliability.

[0017] According to the present invention, a demountable floorboard as defined by claim 1 is provided. The dependent claims show some examples thereof. An inflatable boat according to the present invention is defined by claim 7.

[0018] Said object is achieved by a demountable floorboard for an inflatable boat comprising a front section, a central section and a stern section, said sections are provided with connecting profiles for releasable connection. At that, the central section has one or more tiers, each is made of segments shaped, when seen from above, as trapezoids, for examples as rectangular trapezoids, wherein an acute angle at one of their corners is provided in a preferred embodiment. The floorboard segments of the central section tiers are made in such a way that the bases of said rectangular trapezoids are parallel to the symmetry axis of the floorboard when assembled. Thus, the slit of the connecting profiles is disposed outside the areas of contact of the central section of the floorboard to the front section and the stern section of the floorboard, and therefore the connecting profiles of the front section and the stern section are easier to connect to the connecting profile of the central section. Similar advantage is maintained during the process of disassembly of the floorboard and its removal from an inflatable boat.

[0019] An acute angle is particularly an angle of less than 90 degrees.

[0020] With this, said segments shaped as trapezoids, for example as rectangular trapezoids, may be provided with connecting profiles which enable their releasable interconnection.

[0021] Configuring the segments of the central section of the floorboard as trapezoids, like rectangular trapezoids, for example, and/or with an acute angle at one of their corners, with the parallel sides of these trapezoids (that may be pre-inserted into stringers) adjoining the boat tubes (sides), allows easy installation and removal of the floorboard sections into/from an inflatable boat with boat sides fully inflated, and even when deflated. With this, there is no slit of lateral connecting profiles in the areas of interconnection of the tiers of the central section, and their connection to the front section and the stern section, and thereby the procedure of the floorboard assembly and disassembly is simplified and at the same time rigidity, strength and reliability of the floorboard is increased.

[0022] The segments are shaped as trapezoids, wherein the respective trapezoid may be free of any 90-degree angle or may have exactly two 90-degree-angles. In particular, the segments shaped as trapezoids or rectangular trapezoids, respectively, have a shape different from a rectangle and/or square.

[0023] Preferably each of the connecting profiles interconnecting the sections is made as a single piece continuously extending along the whole joint. Furthermore, the parallel sides of the central section segments may be provided with side profiles.

[0024] Technical results that the present invention addresses are reduction of labor input, simplification and facilitation of the procedure of inflatable boat floorboard assembly and disassembly, as well as enhancement of rigidity, strength and reliability of the floorboard.

[0025] Due to modifications in design, installation/removal of the floorboard into/from the boat is simplified both when the sides are fully inflated and when the sides are fully (partially) deflated.

Brief description of the drawings

[0026] The invention is illustrated by the following figures.

Fig.1 shows an inflatable boat with a floorboard installed

Fig. 2 shows floorboard sections separated

[0027] Fig. 1, 2 have the following reference numbers:

1- front floorboard section
2- central floorboard section
3- stern floorboard section
4- connecting profile
5- lengthwise stringer
6- side profile
7- aperture for boat keelson air valve
8- segment of central floorboard section of one tier
9- segment of central floorboard section of the other tier
10- inflatable side (tube) of the boat

Detailed description of preferred embodiments of the invention

[0028] The present invention can be successfully embodied in a design of a floorboard containing a front section 1, a central section 2 and a stern section 3, said sections are provided with connecting profiles 4.

[0029] To embody the invention, the following modifications in floorboard design are made.

[0030] Central section 2 of the floorboard is made composed of segments 8 shaped, when seen from above

(projection onto a horizontal plane), as rectangular trapezoids with an acute angle at one of their corners, said segments can be releasably interconnected by means of connecting profiles 4 at an angle (α) to longitudinal axis (S_1S_2) of symmetry of the floorboard. At that, the bases of said rectangular trapezoids are parallel to axis (S_1S_2) of symmetry of the floorboard, which ensures reliable rigidity and strength of obtained flooring even under significant lateral loads as well as enhancement of general reliability of the structure. Additionally, each of the connecting profiles 4 which interconnect the sections is made as a single piece continuously extending along the whole joint, which means that each of the interconnected connecting profiles of adjacent floorboard sections is made as a continuous single piece connecting profile 4. Further, said segments 8 of the central section may be provided with side profiles 6 which are inserted into lengthwise stringers 5 of the boat when assembling the floorboard.

[0031] Lengthwise stringers 5, connecting profiles 4 and side profiles 6 may be made of e.g. aluminium alloy or polymer material.

[0032] Segments 8 may be made of e.g. waterproof multi-layer plywood, polymer material or aluminium alloy.

[0033] An embodiment of "projection-slot" coupling of connecting profiles is disclosed in patent RU 136,413 U1, which does not exclude using other types of connecting profiles. Connecting and side profiles are permanently attached to segment edges, e.g. by gluing or riveting.

[0034] If an inflatable boat is significantly long, then central floorboard section may be composed of several tiers; at that, each tier is made of segments 8 or 9, preferably two segments 8 or 9 which are shaped, when seen from above, as rectangular trapezoids with an acute angle at one of their corners. Segments 8 and 9 of tiers of the central section 2 are releasably interconnected as well as releasably connected to the stern section 3 and the front section 1 by means of connecting profiles 4 at right angle to longitudinal axis (S_1S_2) of symmetry of the floorboard.

[0035] The floorboard is placed onto the elastic bottom of the boat regardless of inflation degree of the sides (fully inflated, underinflated or fully deflated) as follows.

[0036] Front section 1 is pushed forward into the fore part of the boat bottom. Then, the lengthwise stringers 5, if any, are placed between the boat side tubes and the bottom of the boat. After the lengthwise stringers 5 have been mounted, one of segments 8 of one tier of the central section 2 is mounted, wherein the parallel bases of the rectangular trapezoid are contacting the longitudinal stringers 5. The next segment 8 of this tier of central section 2 is likewise pushed in along the line of connection, which is set at an angle (α) to longitudinal axis of symmetry of the floorboard. With segment 8 fully pushed in, the segments 8 of one tier of central section 2 become wedged against the lengthwise stringers 5, which in turn abut against the sides of the boat. After one tier of central section 2 has been mounted, segments 9 of the other tier as well as of the following tier of the central section 2 are mounted in a sequential order. The central section 2 of the floorboard can include one or more tiers, number of which depends on the length of inflatable boat. Then the stern section 3 is mounted, thereby segments 8 and 9 of the central section 2 are wedged, and the front section 1 is pressed.

[0037] Demounting of the floorboard is carried out in reverse order regardless of inflation degree of the sides (fully inflated, underinflated or fully deflated).

[0038] It should be mentioned that in case of some floorboard designs the front section of the floorboard is also designed as a composite section, which does not change the essence of the claimed technical solution.

[0039] Patent search that was carried out has proved international novelty and inventive step of the present invention.

[0040] Prototype testing of demountable floorboard for inflatable boat has proved industrial applicability of the invention and its relevance to the claimed technical results.

Claims

1. A demountable floorboard for inflatable boat, comprising a front section, a central section and a stern section, said sections are provided with connecting profiles for releasable connection, wherein the central section comprises one or more tiers, each of said tiers is made of segments shaped, when seen from above, as trapezoids, **characterized in that** the segments of tiers of the central section are made in such a way that the bases of said rectangular trapezoids are parallel to the symmetry axis of the floorboard when assembled.

2. The demountable floorboard according to claim 1, **characterized in that** said segments are provided with connecting profiles which ensure their releasable interconnection.

3. The demountable floorboard according to any of claims 1 or 2, **characterized in that** it comprises lengthwise stringers, wherein the bases of said trapezoids are provided with side profiles which are inserted into said lengthwise stringers.

4. The demountable floorboard according to any of claims 1 to 3, **characterized in that** each of the profiles interconnecting said sections is made as a single piece continuously extending along the whole joint.

5. The demountable floorboard according to any of claims 1 to 4, **characterized in that,** each of said tiers is made of segments shaped, when seen from above, as rectangular trapezoids.

6. The demountable floorboard according to any of claims 1 to 5, **characterized in that** each of said tiers is made of segments shaped, when seen from above, as trapezoids with an acute angle at one of their corners.

7. An inflatable boat having a demountable floorboard according to any of the preceding claims.

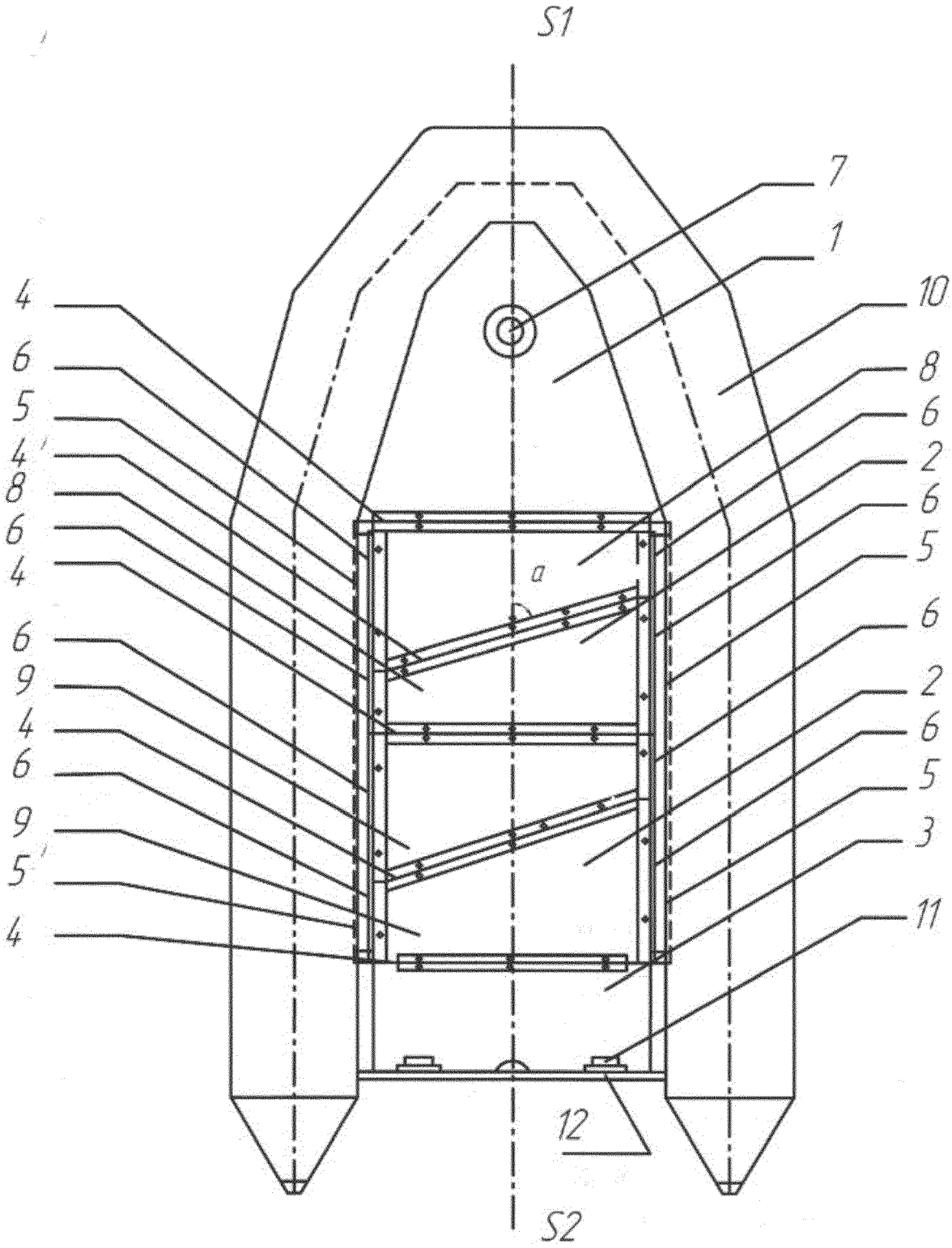

Fig. 1

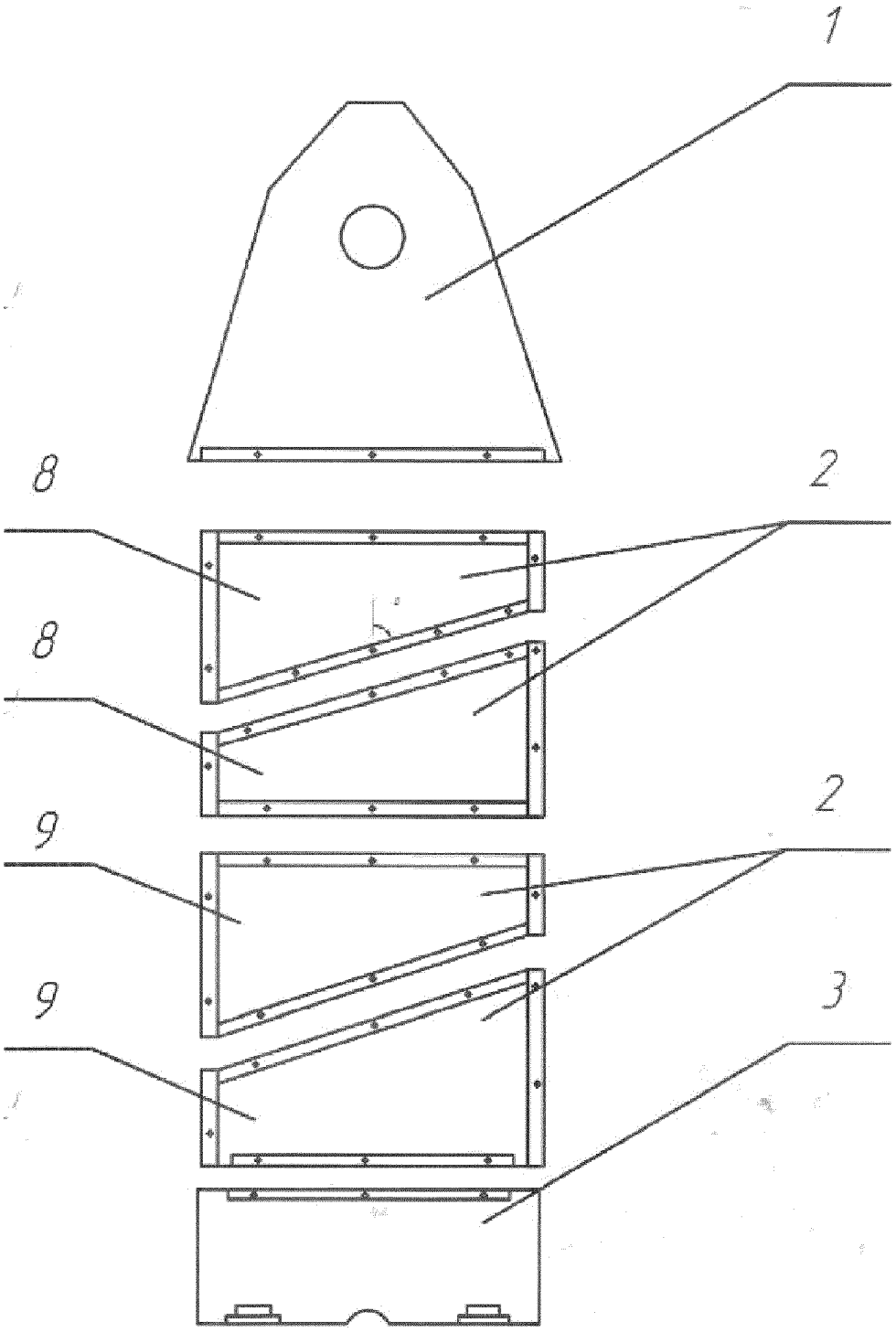

Fig. 2

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 18 16 9877

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D	RU 169 992 U1 (-) 11 April 2017 (2017-04-11) * figures *	1-7	INV. B63B7/08
A	FR 1 285 731 A (PIRELLI) 23 February 1962 (1962-02-23) * abstract * * figures *	1,7	
A	US 3 566 425 A (WELTY CHARLES R) 2 March 1971 (1971-03-02) * figures *	1,7	

TECHNICAL FIELDS SEARCHED (IPC)

B63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 September 2018	Gardel, Antony

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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 16 9877

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-09-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
RU 169992 U1	11-04-2017	NONE	
FR 1285731 A	23-02-1962	NONE	
US 3566425 A	02-03-1971	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- RU 136413 U1 **[0004] [0005] [0033]**
- RU 155210 U1 **[0007]**
- RU 169992 U1 **[0013] [0014]**

Non-patent literature cited in the description

- **KOROLEV A.N. ; ZHOKHOV V.P.** *Inflatable boats. L.: Sudostroenie,* 1989, 83-84 **[0003]**