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(54) **EXTENSIBLE LADDER AND BOAT COMPRISING SAID EXTENSIBLE LADDER**

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ÉCHELLE EXTENSIBLE ET BATEAU COMPRENANT CETTE ÉCHELLE

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to an extensible ladder, in particular installable inside an under-deck access well of a boat. In particular, the present invention relates to ladders with extensible handrails useful for facilitating access to wells of boats.

[0002] The present invention also relates to a boat comprising said extensible ladder installed inside the under-deck access wells of the boat itself.

PRIOR ART

[0003] As is known, there are on the market ladders with extensible uprights which facilitate the passage of a user through wells or manholes.

[0004] An extensible ladder, described in patent application KR 20140049239 A, comprises hollow tubular handrails within which an extensible ladder is housed. Each fixed tubular handrail has a curvilinear groove configured to house a pin constrained to the extensible ladder and guide the sliding and rotation of the extensible ladder externally to a well.

[0005] A drawback highlighted by this type of extensible ladders is given by the use of a movable pin for sliding inside a guide, which is unsuitable for use in maritime environments. In fact, the formation of deposits and/or encrustations between the fixed handrail and the removable handrail or at the guide groove of the pin jeopardizes the functioning of the ladder, for example by limiting or preventing the sliding of the extensible handrail along the groove, or preventing it from locking, thus reducing the operational reliability of the ladder.

[0006] US3502175A discloses a ladder comprising a pair of ladder sections slidably connected together, with each section comprising parallel side rails and a plurality of steps fixed at spaced intervals along said ladder sections. Latch means carried by one of said ladder sections are designed to hold the ladder in an extension position.

[0007] US6422340B1 discloses a ladder with a catch mechanism for an elongated ladder portion. The ladder portion is slidably engageable with and along the anchored frame to thereby selectively adjust the height of the ladder and thereby accommodate ready movement of persons between a dock and a proximate watercraft disposed at relatively different elevations.

[0008] JP2013249626A shows a ladder with a fall prevention fence attached in an upper part of the ladder body so as to be rotatable between a vertical direction and a lateral direction.

OBJECT OF THE INVENTION

[0009] It is therefore the object of the present invention to solve at least one of the drawbacks and/or limitations of the above solutions.

[0010] A first object of the present invention is to provide a ladder having a simple and compact structure capable of minimizing the overall dimensions.

[0011] A further object of the present invention is to provide a ladder which can be easily installed within the narrow spaces typical of the wells of boats.

[0012] Another object of the invention is to provide a ladder which is able to operate without functional problems even in aggressive environments such as the marine environment.

[0013] A further object of the present invention is to provide a ladder which has a high degree of reliability and which requires a reduced number of maintenance interventions.

[0014] These objects and others, which will become more apparent from the following description, are substantially achieved by a ladder according to one or more of the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] Some embodiments and some aspects of the invention are described hereinafter with reference to the accompanying drawings, provided only for illustrative and, therefore, non-limiting purposes, in which:

- Figures 1A and 1B are perspective views of a ladder according to the present invention, in a first and a second operative condition of the extensible handrails, respectively;
- Figure 2 is a cross-sectional view according to the plane II-II of Figure 1A of the ladder according to the present invention during the first operative condition, in which the removable handrails are in a lowered position and entirely or almost entirely arranged adjacent to the fixed handrails of the ladder itself;
- Figures 3 and 4 are perspective views of a detail of the ladder in the condition of Figure 1A and in the condition of Figure 1B, respectively;
- Figure 5 is a perspective view showing a possible variant according to a further embodiment of the ladder according to the present invention;
- Figure 6 is a cross-sectional view according to plane VI-VI of Figure 5;
- Figure 7 is a perspective view of a boat according to the present invention showing the ladder of Figure 1 installed at an under-deck access well of the boat itself;
- Figures 8 and 9 are perspective views of a boat according to the present invention showing the ladder of Figure 1 installed at a perimeter edge delimiting a hull of the boat itself.

DETAILED DESCRIPTION

[0016] The invention relates to a ladder 1 for boat wells and a boat 50 having the ladder 1 operating at the or at each well. With reference to Figure 7, a boat 50 is illus-

trated having at least one well 51 for accessing an area below deck of the boat. A ladder 1 operates at each well 50 which allows the on-board personnel to descend towards the area below deck or to go up from the area below the deck, for example to reach a deck of the boat 50.

[0017] The well 51 is delimited at the top by a passage opening 52 defined on the deck of the boat, through which the on-board personnel have access to the area below deck. The well 51 can be peripherally delimited by at least one side wall 14, which delimits the opening 52 and allows the fixing of a portion of the ladder. Figures 1A and 1B schematically illustrate the well area and the access below deck, which has a base plane 16 delimiting the well 51 below and configured to allow the fixing of a further portion of the ladder. Of course, the ladder can alternatively be fixed only to the side wall 14. The boat 50 can further comprise a closing door 53 of the well 51 movable, for example rotationally movable, with respect to the passage opening 52 of the well 51 and configured to selectively allow and prevent access to the well 51.

[0018] It should be further noted, as shown in Figures 8 and 9, that the boat 50 has a hull 54 delimited by a perimeter edge 55: at the perimeter edge, the ladder 1 can operate to allow a user access on board the boat 50.

[0019] In particular, Figure 8 shows a boat 50 comprising a safety bulkhead 57 engaged to the hull at the perimeter edge 55. In this configuration, the ladder 1 can be engaged with the safety bulkhead 57 to allow access on board the boat, for example from one side of the latter.

[0020] Figure 9 instead shows a stern area of the boat, the latter comprising a platform 56 engaged to the hull at the perimeter edge. In this configuration of the boat 50, the ladder 1 can be engaged to the platform 56, allowing a user to board the boat.

[0021] It should be noted that during a stationary condition of the boat, the ladder 1 is at least partially arranged above the safety bulkhead 57 and/or the platform 56 to facilitate the boarding of a user.

[0022] As shown for example in Figures 1A and 1B, the ladder comprises a first and a second fixed handrail 2a, 2b fixed to the well and configured to facilitate gripping of the ladder. In particular, each fixed handrail has a respective elongated body 3 extending between a lower end and an upper end 3a, 3b along substantially rectilinear and mutually parallel directions. The first and second fixed handrails 2a, 2b further have an upper section 13 extending transversely to the elongated body starting from the upper end 3b, designed to fix the ladder to the side wall 14 of the well 51. Each upper section 13 extends in interposition between the elongated body 3 and the side wall 14 of the well to which the handrail is fixed. In fact, it should be noted that the upper section 13 has a reduced length, for example between 0.5m and 0.2m, to allow the construction of a ladder capable of minimizing the overall dimensions and facilitating the transit of a user of the ladder through the well. The first and second fixed handrails 2a, 2b can be further constrained to the base

plane 16 of the well 51 or to the lower wall of the wall 14, at the lower end 3a of the respective elongated body 3.

[0023] The ladder further comprises a predetermined number of rungs 4 transversely engaged with the elongated body 3 of the first and second fixed handrails 2a, 2b: the rungs 4 are parallel to each other and spaced along the extension direction of each fixed handrail and configured to support a user of the ladder and allow the transit thereof. Each rung 4 preferably has a predetermined transverse bulk adapted to allow comfortable and safe rest and support for the user during ascent or descent.

[0024] As shown in the accompanying figures, the ladder has at least one extensible handrail 5: actually, in the currently preferred embodiment the ladder comprises an extensible handrail 5a movable relative to the first fixed handrail 2a and an auxiliary extensible handrail 5b movable relative to the second fixed handrail 2b.

[0025] It should be noted that the extensible handrail 5a and the auxiliary extensible handrail 5b are preferably identical to each other and engaged in a similar way to the respective fixed handrails 2a, 2b. Consequently, for ease of discussion, when speaking generically of extensible handrail (or of each extensible handrail), reference is made to the features of both the extensible handrail 5a and of the auxiliary extensible handrail 5b or of the single handrail 5 if a ladder with one handrail only. Further, in the accompanying figures reference is made to an extensible handrail 5a movable independently with respect to the auxiliary extensible handrail 5b: in other words, the extensible handrail 5a is movable along the first fixed handrail 2a independently of the mobility of the auxiliary extensible handrail 5b along the second fixed handrail 2b. In practice, each extensible handrail is constrained to the respective one of said first and second fixed handrails, but there is no rigid mechanical connection between the extensible handrail 5a and the auxiliary extensible handrail 5b which requires the two handrails to be movable in a synchronous manner respectively along the first and second fixed handrails, that is, which forces the two extensible handrails to go up and down together.

[0026] Although the described solution is currently the preferred and most advantageous one, it is not excluded, however, that in an embodiment of the present invention, the extensible handrail 5a and the auxiliary extensible handrail 5b are synchronously movable. For example, the extensible handrail 5a and the extensible handrail 5b can be mechanically connected to each other (for example with a transverse bar or other mechanical connection) or synchronized in motion through the use of one or more motors or actuators and appropriate transmission components adapted to connect the extensible handrails to each other making their movement synchronous and motorized or servo-assisted.

[0027] From the structural point of view, each extensible handrail 5, 5a, 5b is engaged to the elongated body 3 of the fixed handrail 2a or 2b and extends along an axis

X parallel and adjacent to the elongated body 3 of the fixed handrail 2a or 2b. The extensible handrail 5, 5a, 5b can also be positioned relative to the fixed handrail 2a, 2b between a first and a second operative position. In the first operative position, the extensible handrail 5, 5a, 5b is movable along at least a portion of the elongated body of the respective fixed handrail 2a or 2b, while, in the second operative position, the extensible handrail interferes with at least one rung 4, to limit or prevent the mobility of the extensible handrail 5, 5a, 5b along the same elongated body 3 of the respective fixed handrail.

[0028] In the first operative condition, the extensible handrail 5, 5a, 5b can also be moved parallel to the fixed handrail 2a, 2b between a lowered position and an extended position. In the lowered position, each extensible handrail 5, 5a, 5b is at least partially arranged adjacent to the respective fixed handrail 2a, 2b inside the well 51, while, in the extended position, at least a portion of the extensible handrail 5, 5a, 5b is placed outside the well 51, in such a way as to allow a user to grip the extensible handrail, for example placed on the deck of the boat. In the embodiment of the invention shown in Figures 8 and 9, at least a portion of the extensible handrail 5, 5a, 5b is placed above the safety bulkhead 56 or above the platform 57, to allow gripping of the extensible handrail by a user, for example placed on the deck of the boat or on the platform itself, and facilitate the descent thereof. In particular, as shown in the accompanying figures, at least a portion of the extensible handrail, optionally having a length equal to at least one quarter of the total length of the extensible handrail itself, is located outside the well 51. It should be further noted that the accompanying figures show the extensible handrails 5, 5a, 5b manually movable between the lowered position and the extended position. However, as already mentioned, the possibility of motorized or servo-assisted movement to move the/each extensible handrail between the respective lowered position and the respective extended position is not excluded. Each extensible handrail 5, 5a, 5b can also have an arched end section 22 which, at least in the second operative condition of the extensible handrail, is placed above the respective fixed handrail 2a, 2b: such end section can extend at least partially externally to the well 51, to facilitate the grip of the extensible handrail by a user and to facilitate the grip thereof and/or assist the descent thereof towards the space below deck.

[0029] As shown in Figures 1A, 1B and 2, the ladder can have at least a first and second constraint element 6a, 6b respectively integral with the extensible handrail 5a and the auxiliary extensible handrail 5b and configured to engage with the elongated body 3 of a respective first and second fixed handrail 2a, 2b. Of course, in the case of a ladder with a single extensible handrail 5, there will be a constraint element 6 associated with such single extensible handrail. Each constraint element 6, 6a, 6b is slidably engaged to the elongated body 3 of the respective fixed handrail 2a, 2b in interposition between the same fixed handrail and the extensible handrail 5, 5a, 5b

to allow the movement of the extensible handrail itself between the first and the second operative condition and the displacement of the extensible handrail 5, 5a, 5b between the lowered position and the extended position.

[0030] Each extensible handrail 5, 5a, 5b can comprise two or more respective constraint elements 6 defined at distinct portions of each extensible handrail 5, 5a, 5b, so as to support the extensible handrail itself and position it parallel to the fixed handrail 2a, 2b. Each constraint element 6, 6a, 6b is slidably engaged to the elongated body 3 of the respective first or second fixed handrail 2a, 2b to allow movement of the extensible handrail 5, 5a, 5b relative to the fixed handrail.

[0031] As shown in Figure 2, each constraint element 6, 6a, 6b comprises a main body 7 engaged transversely to the respective extensible handrail 5, 5a, 5b and configured to interfere with a rung during the second operative condition of the extensible handrail, preventing the descent of the extensible handrail itself from the extended position to the lowered position. Each constraint element 6, 6a, 6b further comprises a first and a second arm 7a, 7b distinct and spaced apart and extending in extension starting from the main body 7. The first and the second arm 7a, 7b of each constraint element extend along respective curvilinear trajectories having mutually facing concavities. In other words, the first and second arms 7a, 7b, in cooperation with the main body 7, define a convex shape having, in cross section, a substantially "C" or "U" shape. The first and second arms 7a, 7b are in fact spaced apart, defining an intermediate space 8 in interposition between respective ends opposite to the main body 7.

[0032] The first and the second arm 7a, 7b of each constraint element 6 further define a seat 20 configured to at least partially house the elongated body 3 of the respective fixed handrail. From the structural profile, the seat 20 of each constraint element 6, 6a, 6b has, in cross-section, a predominant portion of the profile thereof complementarily shaped with respect to a perimeter profile of the cross-section of the elongated body 3 of the fixed handrail 2. This conformation of the seat 20 allows the extensible handrail 5, 5a, 5b to be guided along the elongated body 3 of the respective fixed handrail 2a, 2b, between the first and second operative conditions and vice versa. The conformation of the seat 20 of each constraint element 6, 6a, 6b also prevents the extraction of the extensible handrail 5, 5a, 5b from the fixed handrail 2, allowing the translation of the same extensible handrail along the elongated body 3 of the respective fixed handrail, as well as the rotation of the extensible handrail 5, 5a, 5b around the elongated body 3. To prevent the extraction of the constraint element 6, 6a, 6b from the elongated body of the respective fixed handrail 2a, 2b, the opposite ends of the first and second arms 7a, 7b are placed at a minimum distance smaller than an overall minimum dimension of the cross section of the elongated body of the fixed handrail 2a, 2b. For example, the elongated body 3 of the fixed handrail 2a, 2b can have, in

cross section, a circular profile with a larger diameter than the minimum distance between the first and second arms 7a, 7b. Furthermore, the main body 7 of the constraint element 6, 6a, 6c defines, in cooperation with the first and second arms 7a, 7b, a single rigid body, which cannot be elastically deformed without the aid of hydraulic/pneumatic tools or members, so as to prevent the undesired decoupling of the constraint element from the respective fixed handrail.

[0033] It should be further noted how the opposite ends of the first and second arms 7a, 7b of each constraint element 6, 6a, 6b are placed at a minimum distance greater than a maximum overall dimension of the cross section of each rung 4. In other words, the minimum distance between the first and second arm 7a, 7b of each constraint element is sufficiently high to allow, during the movement of the extensible handrail 5, 5a, 5b between the lowered position and the extended position, the passage of a rung 4 through the intermediate space 8, preventing mechanical interference between the rung 4 itself and the constraint element 6, 6a, 6b.

[0034] In an embodiment of the present invention, each extensible handrail 5, 5a, 5b has at least one respective stop element 9 configured to interfere, at least in the second operative condition of the extensible handrail 5, 5a, 5b, with a rung 4 and at least partly prevent the rotation of the extensible handrail 5, 5a, 5b around the elongated body 3 of the fixed handrail 2. As shown in Figures 3 and 4, the stop element 9 of each extensible handrail 5, 5a, 5b comprises at least one relief emerging transversely from at least one or each constraint element 6, 6a, 6b associated with the extensible handrail itself (in other words if an extensible handrail carries more than one constraint element, at least one of these constraint elements is provided with the stop element 9 in the form of a relief). The stop element or relief 9 is configured to allow the arrangement of at least one rung 4, in interposition between the stop element 9 and the extensible handrail 5. In this configuration, the stop element 9 interferes with the rung 4, preventing at least in part the rotation of the extensible handrail 5, 5a, 5b around the elongated body 3 of the fixed handrail 2a, 2b. The extensible handrail 5, 5a, 5b can comprise a first and a second stop element 9a, 9b, distinct from each other (preferably carried by the same constraint element 6, 6a, 6b) and spaced apart to define a seat 10 which, at least in the second operative condition of the extensible handrail 5, is configured to receive a rung 4 inserted therein. The first and second stop elements 9a, 9b are for example carried by one or more constraint elements 6, 6a, 6b and placed at a minimum distance greater than the maximum overall dimension of the cross section of each rung 4, to allow insertion and extraction of a rung 4 from the seat 10, simply by slightly raising and lowering the extensible handrail on which one is working. The rung 4, inserted within the seat 10, is interposed between the first and the second stop element 9a, 9b and prevents the rotation of the extensible handrail 5, 5a, 5b around the elongated body 3 of the

fixed handrail 2a, 2b. The displacement of the extensible handrail 5, 5a, 5b from the second to the first operative condition, takes place after moving the extensible handrail 5, 5a, 5b transversely to the rungs (in particular upwards) to determine the disengagement of the rung 4 from the seat 10 of the constraint element 6, 6a, 6b. In other words, the extraction of the rung 4 from the seat 10 of the stop element 9 takes place by lifting the extensible handrail 5, 5a, 5b, while the displacement of the extensible handrail from the second to the first operative condition occurs by subsequent rotation of the extensible handrail 5 substantially around the fixed handrail 2a, 2b.

[0035] In an embodiment variant illustrated in Figure 5 and Figure 6, the ladder can further comprise a first and a second guide 12a, 12b (or a single guide 12 on one or the other of the fixed handrails 2a, 2b if the ladder includes only one extensible handrail 5). Each guide 12, 12a, 12b emerges radially away from an external surface of the elongated body 3 of a respective fixed handrail 2a, 2b. The first and second guides 12a, 12b of the example of Figure 6 are substantially identical to each other: in any case each guide 12, 12a, 12b is configured, during the first operative condition of the respective extensible handrail, to interfere with an extensible handrail 5, 5a, 5b and prevent the rotation thereof around a respective fixed handrail.

[0036] In particular, as shown for example in Figures 5, 6, each guide 12, 12a, 12b extends along a direction parallel to the axis X in interposition between two successive rungs 4. During the displacement of the extensible handrail along the elongated body 3 of the respective fixed handrail 2a, 2b, the guide 12, 12a, 12b is arranged inside the intermediate space 8 of the constraint element, preventing undesired rotation of the extensible handrail around the fixed handrail and facilitating the sliding and at least partial extraction of the extensible handrail outside the well 51. In fact, the guide 12, 12a, 12b rotationally constrains the extensible handrail 5, 5a, 5b during the translation of the latter along the elongated body 3 of the fixed handrail 2. The guide 12, 12a, 12b has, in cross section, a maximum overall dimensions smaller than the minimum distance between the first and the second arm 7a, 7b of the constraint element 6, 6a, 6b so that the constraint element can slide along the respective guide 12, 12a, 12b. It should also be noted that the guide 12, 12a, 12b can be spaced at the bottom from an upper surface of a rung 4 to allow the rotation of the respective extensible handrail around the associated fixed handrail and thus allow the achievement of the second operative condition. In particular, each guide 12, 12a, 12b is spaced from the upper surface of the rung 4 by an amount measured parallel to the axis X greater than an overall size (in thickness) of the constraint element 6 always measured along the axis X. Each guide 12, 12a, 12b in cooperation with the upper surface of the rung 4 defines a passage configured to allow, during the transition between the first and second operative conditions of the extensible handrail 5, 5a, 5b, the rotation of the ex-

tensible handrail itself around to the elongated body 3 of the respective fixed handrail 2a, 2b.

[0037] In use, the ladder is entirely fixed inside the well 51, constrained at the top to the side wall 14 of the well at the end sections 13 of each fixed handrail and below it fixed to the base surface 16 or to the side wall of the well 51 at the first end 3a of each fixed handrail 2.

[0038] To reach the space below the deck of the boat, a user located on the deck lifts the closing door 53 of the well (if present) to access the ladder 1 entirely located in the area below deck. The user verifies that each extensible handrail is in the first operative condition and subsequently moves, independently or simultaneously, the extensible handrail(s) 5, 5a, 5b from the lowered position to the extended position. During such displacement, at least the end section 11, for example arched, of each extensible handrail emerges from the well 51. In particular, at least a portion of the elongated body 3 of each extensible handrail 5 emerges from the well 51, in such a way as to distance each end section 11 from the deck of the boat and allow the user to grip each end section 11 without bending down. Following the displacement of the one or more extensible handrails 5, 5a, 5b in the extended position, the user rotates, independently or simultaneously, each extensible handrail around the respective fixed handrail, reaching the second operative condition. Following such displacement, each constraint element 6, 6a, 6b is arranged in abutment against a rung 4, preventing the descent of an extensible handrail 5, 5a, 5b in the retracted position. The user can thus firmly cling to the extensible handrail(s) 5, 5a, 5b before going down or during the descent into the area below deck of the boat.

[0039] In the embodiment of the invention in which each constraint element 6, 6a, 6b has respective first and second stop elements 9a, 9b, the user reaches the second operative condition of each extensible handrail 5, 5a, 5b by engaging a rung 4 in insertion inside the seat 10, by rotating the extensible handrail itself.

[0040] Vice versa, the displacement of the extensible handrail 5, 5a, 5b from the first to the second operative condition and subsequently to the retracted position, occurs as a result of:

- disengagement of each constraint element 6, 6a, 6b from a rung 4 to which the constraint element is engaged, in particular by lifting the extensible handrail or both extensible handrails so that the rung 4 comes out of the seat 10 or in any case cannot more interfere with the stop element 9a and/or 9b,
- rotation of the extensible handrail 5, 5a, 5b to the first operative position,
- displacement of the extensible handrail 5, 5a, 5b to the retracted position.

[0041] As mentioned above, the displacement of each extensible handrail 5, 5a, 5b can be done manually; however, the provision of a motorized system for the automatic movement of each extensible handrail from the re-

tracted position to the extended position and from the first to the second operative condition and vice versa is not excluded.

Claims

1. Ladder comprising:

- a first and a second fixed handrail (2a, 2b) each of which has an elongated body (3) extending between a lower end and an upper end (3a, 3b),
 - a pre-set number of rungs (4) transversely engaged to the first and to the second fixed handrail (2a, 2b),
 - at least one extensible handrail (5a) engaged to the elongated body (3) of the first fixed handrail (2a),
- wherein the extensible handrail (5a) is configured to be positioned relative to the first fixed handrail (2a) at least between:

- a first operative condition in which the extensible handrail (5a) is movable along at least one portion of the elongated body (3) of the first fixed handrail (2a), and
- a second operative condition in which the extensible handrail (5a) is configured to interfere with at least one rung (4) which limits or hinders the mobility thereof along the elongated body (3) of the first fixed handrail (2a),

wherein the extensible handrail (5a) has at least one first constraint element (6a) slidably engaged to the elongated body (3) of the first fixed handrail (2a),

characterized in that said at least one first constraint element (6a) has:

- a main body (7) transversely engaged to the extensible handrail (5a),
- a first and a second arm (7a, 7b) projecting as an extension of the main body, distinct and spaced from each other;

wherein an intermediate space (8) is defined between respective ends of the first and of the second arm (7a, 7b) opposite the main body (7); and wherein the first and the second arm (7a, 7b) of the first constraint element (6a) define a seat (20) configured to at least partially house the elongated body (3) of the first fixed handrail (2a).

2. Ladder according to the preceding claim comprising an auxiliary extensible handrail (5b) engaged to the elongated body (3) of the second fixed handrail (2b), wherein the auxiliary extensible handrail (5b) is con-

figured to be positioned relative to the second fixed handrail (2b) at least between:

- a first operative condition in which the auxiliary extensible handrail (5b) is movable along at least one portion of the elongated body (3) of the second fixed handrail (2b),
 - a second operative condition in which the auxiliary extensible handrail (5b) is configured to interfere with at least one rung (4) which limits or hinders the mobility thereof along the elongated body (3) of the second fixed handrail (2b).
3. Ladder according to the preceding claim, wherein the extensible handrail (5a) is movable independently of the auxiliary extensible handrail (5b), particularly wherein there is no rigid mechanical connection between the extensible handrail (5a) and the auxiliary extensible handrail (5b) that compels the two handrails to be synchronously movable.
4. Ladder according to the claim 2 or 3, wherein:
- the extensible handrail (5a) comprises two or more first constraint elements (6a) slidably engaged at distinct portions of the elongated body (3) of the first fixed handrail (2a), and
 - the auxiliary extensible handrail (5b) comprises two or more second constraint elements (6b) slidably engaged at distinct portions of the elongated body (3) of the second fixed handrail (2b).
5. Ladder according to the preceding claim, wherein each second constraint element (6a, 6b) has:
- a main body (7) transversely engaged to the extensible handrail (5a) or with the auxiliary extensible handrail (5b),
 - a first and a second arm (7a, 7b) projecting as an extension of the main body, distinct and spaced from each other; and in which an intermediate space (8) is defined between respective ends of the first and of the second arm (7a, 7b) opposite the main body (7),
- wherein the first and the second arm (7a, 7b) of the second constraint element (6b) define a seat (20) configured to at least partially house the elongated body (3) of the second fixed handrail (2b).
6. Ladder according to the preceding claim, wherein the seat (20) of the first constraint element (6a) has, in cross-section, a predominant portion of the profile thereof complementarily shaped with respect to a perimeter profile of the cross-section of the elongated body (3) of the first fixed handrail (2a), and wherein the seat (20) of the second constraint element (6b) has, in cross-section, a predominant

portion of the profile thereof complementarily shaped with respect to a perimeter profile of the cross-section of the elongated body (3) of the second fixed handrail (2b).

7. Ladder according to any one of the two preceding claims, wherein the main body (7) of a respective first and second constraint element (6a, 6b) defines, in cooperation with the first and the second arm (7a, 7b), a single rigid body,

wherein the intermediate space (8) of the first constraint element (6a) is configured to prevent the removal of the elongated body (3) of the first fixed handrail (2a) from the seat (20), and wherein the intermediate space (8) of the second constraint element (6b) is configured to prevent the removal of the elongated body (3) of the second fixed handrail (2b) from the seat (20).

8. Ladder according to any one of the three preceding claims, wherein the opposite ends of the first and second arm (7a, 7b) of the first constraint element (6a) are arranged at a minimum distance smaller than the minimum overall dimension of the cross-section of the elongated body of the first fixed handrail (2a),

and wherein the opposite ends of the first and second arm (7a, 7b) of the second constraint element (6b) are arranged at a minimum distance smaller than the minimum overall dimension of the cross-section of the elongated body of the second fixed handrail (2b), optionally, wherein the elongated body (3) of the first and of the second fixed handrails (2a, 2b) has a circular-shaped cross-section with a diameter larger than the minimum distance between the first and the second arm (7a, 7b) of the first and of the second constraint element, and wherein the opposite ends of said first and second arm (7a, 7b) of the first and of the second constraint element (6a, 6b) are arranged at a minimum distance greater than a maximum overall dimension of the cross-section of each rung (4).

9. Ladder according to any one of the preceding claims 5 to 8, wherein the intermediate space (8) of the first constraint element (6a), in the first operative condition of the extensible handrail (5a), is configured to receive the rungs (4) passing through, said intermediate space (8) of the second constraint element (6b), in the first operative condition of the auxiliary extensible handrail (5b), being configured to receive the rungs (4) passing through.

10. Ladder according to any one of the preceding claims, wherein the extensible handrail (5a), at least during the transition between the first and second operative condition, is rotatably movable around the elongated body (3) of the first fixed handrail (2a), and/or wherein the auxiliary extensible handrail (5b), at least during the transition between the first and the second operative condition, is rotatably movable around the elongated body (3) of the second fixed handrail (2b).
11. Ladder according to any one of the preceding claims from 5 to 10, wherein the extensible handrail (5a), at least during the transition between the first and second operative condition, is rotatably movable around the elongated body (3) of the first fixed handrail (2a), and wherein the first constraint element (6a), in the second operative condition of the extensible handrail (5a), is arranged in contact with, optionally above, a rung (4), wherein the auxiliary extensible handrail (5b), at least during the transition between the first and the second operative condition, is rotatably movable around the elongated body (3) of the second fixed handrail (2b) and wherein the second constraint element (6b), in the second operative condition of the auxiliary extensible handrail (5b), is arranged in contact with, optionally above, a rung (4).
12. Ladder according to any one of the preceding claims from 4 to 11, wherein the extensible handrail (5a) has at least one respective stop element (9) configured to interfere, at least in the second operative condition of the extensible handrail (5a), with a rung (4) and at least partly prevent the rotation of the extensible handrail (5a) around the elongated body (3) of the first fixed handrail (2a), and wherein the auxiliary extensible handrail (5b) has at least one respective stop element (9) configured to interfere, at least in the second operative condition of the auxiliary extensible handrail (5b), with a rung (4) and at least partly prevent the rotation of the auxiliary extensible handrail (5b) around the elongated body (3) of the second fixed handrail (2b),
- wherein each stop element (9) of the extensible handrail (5a) comprises at least one relief, optionally a pin, projecting transversely from the first constraint element (6a), optionally projecting transversely from at least one of said first and second arm (7a, 7b), and wherein each stop element (9) of the auxiliary extensible handrail (5b) comprises at least one relief, optionally a pin, transversely projecting from the second constraint element (6b), optionally transversely projecting from at least one of said first and second arm (7a, 7b).
13. Ladder according to the preceding claim, wherein at least one rung (4), in the second operative condition of the extensible handrail (5a), is interposed between the stop element (9) of the first constraint element (6a) and the extensible handrail (5a),
- wherein at least one rung (4), in the second operative condition of the auxiliary extensible handrail (5b), is interposed between the stop element (9) of the second constraint element (6b) and the auxiliary extensible handrail (5b), said stop element (9) of the first constraint element (6a) comprising a first and a second stop element (9a, 9b) distinct and spaced from each other, said first and second stop element (9a, 9b) defining a seat (10) which, at least in the second operative condition of the extensible handrail (5a), is configured to receive a rung (4) inserted thereinto, wherein the stop element (9) of the second constraint element (6b) comprises a first and a second stop element (9a, 9b) distinct and spaced from each other, said first and second stop element (9a, 9b) defining a seat (10) which, at least in the second operative condition of the auxiliary extensible handrail (5b), is configured to receive a rung (4) inserted thereinto, optionally the first and the second stop element (9a, 9b) of each of said first and second constraint element (6a, 6b) are arranged at a minimum distance greater than a maximum overall dimension of the cross-section of each rung (4).
14. Ladder according to the preceding claim, wherein the first constraint element (6a) is configured so that the displacement of the extensible handrail (5a) from the second to the first operative condition occurs after the displacement of the extensible handrail (5a) transversely to said rungs, in particular parallel to the first fixed handrail, so as to disengage the rung (4) from the seat (10) of the first constraint element (6a), and wherein the second constraint element (6b) is configured so that the displacement of the auxiliary extensible handrail (5b) from the second to the first operative condition occurs after the displacement of the auxiliary extensible handrail (5b) transversely to said rungs, in particular parallel to the second fixed handrail, so as to disengage the rung (4) from the seat (10) of the second constraint element (6b).
15. Boat (50) comprising:
- at least one hull (54) delimited by a perimeter edge (55),
 - a ladder (1) according to any one of the claims engaged to the hull at the perimeter edge (55) to allow to board the boat;

and/or

- at least one well (51) for access to an under-deck environment of the boat, said well (51) being delimited by a side wall (14) defining a passage opening (52) for a user,

- a ladder (1) according to any one of the preceding claims engaged to the side wall (14) of the well (51);

in particular wherein:

- in the first operative condition, the extensible handrail (5a) is positionable in the extended position thereof in which it is arranged at least partially outside the well (51) passing through the passage opening (52), optionally wherein when the extensible handrail (5a) is in the extended position thereof, a part at least 1/4 or at least 1/3 long of the longitudinal extension of the extensible handrail (5a) extends above the access opening (52); and wherein said extensible handrail (5a), in the extended position, is displaceable from the first to the second operative condition so as to prevent the descent of the extensible handrail toward the lowered position thereof, wherein the extensible handrail does not protrude or slightly protrudes from the passage opening (52) and it is arranged inside the well (51),

- in the first operative condition, the auxiliary extensible handrail (5b) is positionable in the extended position thereof in which it is arranged at least partially outside the well (51) passing through the passage opening (52), optionally wherein when the auxiliary extensible handrail (5b) is in the extended position thereof, a part at least 1/4 or at least 1/3 long of the longitudinal extension of the auxiliary extensible handrail (5b) extends above the access opening (52); and wherein said auxiliary extensible handrail (5b), in the extended position, is displaceable from the first to the second operative condition so as to prevent the descent of the auxiliary extensible handrail toward the lowered position thereof, wherein the auxiliary extensible handrail does not protrude or slightly protrudes from the passage opening (52) and it is arranged inside the well (51);

more in particular wherein:

- each of said first and second fixed handrail (2a, 2b) has an upper section (13) of each ladder extending transversely to the elongated body starting from the upper end (3b), said upper section constraining each of said first and second fixed handrail (2a, 2b) to

the side wall (14) of the well (51) or to the perimeter edge (55) of the boat,

- the under-deck area of the boat has a base plane (16), and wherein each of said first and second fixed handrail (2a, 2b) of the ladder is engaged to the base plane (16) at the lower end (3a) of the respective elongated body (3),

- optionally, the boat (50) comprises a closing door (53) of the well, and wherein, with the extensible handrail and the auxiliary extensible handrail (5a, 5b) in the lowered positions thereof, the closing door can be positioned in a position for closing, optionally in liquid-tight manner, of the access opening (52).

Patentansprüche

1. Leiter, umfassend:

- einen ersten und einen zweiten festen Handlauf (2a, 2b), von welchen jeder einen länglichen Körper (3) aufweist, welcher sich zwischen einem unteren Ende und einem oberen Ende (3a, 3b) erstreckt,

- eine vorbestimmte Anzahl von Sprossen (4), welche transversal mit dem ersten und dem zweiten festen Handlauf (2a, 2b) eingreifen,

- wenigstens einen ausfahrbaren Handlauf (5a), welcher mit dem länglichen Körper (3) des ersten festen Handlaufs (2a) eingreift, wobei der ausfahrbare Handlauf (5a) dazu eingerichtet ist, relativ zu dem ersten festen Handlauf (2a) wenigstens positionierbar zu sein zwischen:

- einem ersten Betriebszustand, in welchem der ausfahrbare Handlauf (5a) entlang wenigstens eines Abschnitts des länglichen Körpers (3) des ersten festen Handlaufs (2a) bewegbar ist, und

- einem zweiten Betriebszustand, in welchem der ausfahrbare Handlauf (5a) dazu eingerichtet ist, mit wenigstens einer Sprosse (4) zusammenzuwirken, welche die Bewegbarkeit davon entlang des länglichen Körpers (3) des ersten festen Handlaufs (2a) beschränkt oder behindert,

wobei der ausfahrbare Handlauf (5a) wenigstens ein erstes Beschränkungselement (6a) aufweist, welches gleitbar mit dem länglichen Körper (3) des ersten Handlaufs (2a) eingreift, **dadurch gekennzeichnet, dass** das wenigstens eine erste Beschränkungselement (6a) aufweist:

- einen Hauptkörper (7), welcher transversal mit dem ausfahrbaren Handlauf (5a) eingreift,
 - einen ersten und einen zweiten Arm (7a, 7b), welche als eine Erstreckung des Hauptkörpers gesondert und beabstandet voneinander vorstehen;
- wobei ein Zwischenraum (8) zwischen entsprechenden Enden des ersten und des zweiten Arms (7a, 7b) gegenüber dem Hauptkörper (7) definiert ist; und
- wobei der erste und der zweite Arm (7a, 7b) des ersten Beschränkungselements (6a) einen Sitz (20) definieren, welcher dazu eingerichtet ist, wenigstens teilweise den länglichen Körper (3) des ersten festen Handlaufs (2a) aufzunehmen.
2. Leiter nach dem vorhergehenden Anspruch, umfassend einen ausfahrbaren Hilfs-Handlauf (5b), welcher mit dem länglichen Körper (3) des zweiten festen Handlaufs (2b) eingreift, wobei der ausfahrbare Hilfs-Handlauf (5b) dazu eingerichtet ist, relativ zu dem zweiten festen Handlauf (2b) wenigstens positionierbar zu sein zwischen:
- einem ersten Betriebszustand, in welchem der ausfahrbare Hilfs-Handlauf (5b) entlang wenigstens eines Abschnitts des länglichen Körpers (3) des zweiten festen Handlaufs (2b) bewegbar ist, und
 - einem zweiten Betriebszustand, in welchem der ausfahrbare Hilfs-Handlauf (5b) dazu eingerichtet ist, mit wenigstens einer Sprosse (4) zusammenzuwirken, welche die Bewegbarkeit davon entlang des länglichen Körpers (3) des zweiten festen Handlaufs (2b) beschränkt oder behindert.
3. Leiter nach dem vorhergehenden Anspruch, wobei der ausfahrbare Handlauf (5a) unabhängig von dem ausfahrbaren Hilfs-Handlauf (5b) bewegbar ist, wobei insbesondere keine steife mechanische Verbindung zwischen dem ausfahrbaren Handlauf (5a) und dem ausfahrbaren Hilfs-Handlauf (5b) vorliegt, welche die beiden Handläufe dazu drängt, synchron bewegbar zu sein.
4. Leiter nach Anspruch 2 oder 3, wobei:
- der ausfahrbare Handlauf (5a) zwei oder mehr erste Beschränkungselemente (6a) umfasst, welche gleitbar an gesonderten Abschnitten des länglichen Körpers (3) des ersten festen Handlaufs (2a) eingreifen, und
 - der ausfahrbare Hilfs-Handlauf (5b) zwei oder mehr zweite Beschränkungselemente (6b) umfasst, welche gleitbar an gesonderten Abschnit-
- ten des länglichen Körpers (3) des zweiten festen Handlaufs (2b) eingreifen.
5. Leiter nach dem vorhergehenden Anspruch, wobei jedes zweite Beschränkungselement (6a, 6b) aufweist:
- einen Hauptkörper (7), welcher transversal mit dem ausfahrbaren Handlauf (5a) oder mit dem ausfahrbaren Hilfs-Handlauf (5b) eingreift,
 - einen ersten und einen zweiten Arm (7a, 7b), welche als eine Erstreckung des Hauptkörpers gesondert und beabstandet voneinander vorstehen, und wobei ein Zwischenraum (8) zwischen jeweiligen Enden des ersten und des zweiten Arms (7a, 7b) gegenüber dem Hauptkörper (7) definiert ist,
- wobei der erste und der zweite Arm (7a, 7b) des zweiten Beschränkungselements (6b) einen Sitz (20) definieren, welcher dazu eingerichtet ist, wenigstens teilweise den länglichen Körper (3) des zweiten festen Handlaufs (2b) aufzunehmen.
6. Leiter nach dem vorhergehenden Anspruch, wobei der Sitz (20) des ersten Beschränkungselements (6a) im Querschnitt einen vorwiegenden Abschnitt des Profils davon komplementär bezüglich eines Umfangsprofils des Querschnitts des länglichen Körpers (3) des ersten festen Handlaufs (2a) gebildet aufweist, und wobei der Sitz (20) des zweiten Beschränkungselements (6b) im Querschnitt einen vorwiegenden Abschnitt des Profils davon komplementär bezüglich eines Umfangsprofils des Querschnitts des länglichen Körpers (3) des zweiten festen Handlaufs (2b) geformt aufweist.
7. Leiter nach einem der beiden vorhergehenden Ansprüche, wobei der Hauptkörper (7) von einem entsprechenden ersten und zweiten Beschränkungselement (6a, 6b) in Zusammenarbeit mit dem ersten und dem zweiten Arm (7a, 7b) einen einzelnen steifen Körper definiert,
- wobei der Zwischenraum (8) des ersten Beschränkungselements (6a) dazu eingerichtet ist, das Entfernen des länglichen Körpers (3) des ersten festen Handlaufs (2a) von dem Sitz (20) zu verhindern, und wobei der Zwischenraum (8) des zweiten Beschränkungselements (6b) dazu eingerichtet ist, das Entfernen des länglichen Körpers (3) des zweiten festen Handlaufs (2b) von dem Sitz (20) zu verhindern.
8. Leiter nach einem der drei vorhergehenden Ansprüche, wobei die gegenüberliegenden Enden des ers-

ten und zweiten Arms (7a, 7b) des ersten Beschränkungselements (6a) bei einer minimalen Distanz kleiner als die minimale Gesamtabmessung des Querschnitts des länglichen Körpers des ersten festen Handlaufs (2a) angeordnet sind,

und wobei die gegenüberliegenden Enden des ersten und zweiten Arms (7a, 7b) des zweiten Beschränkungselements (6b) bei einer minimalen Distanz kleiner als die minimale Gesamtabmessung des Querschnitts des länglichen Körpers des zweiten festen Handlaufs (2b) angeordnet sind,

wobei optional der längliche Körper (3) der ersten und der zweiten festen Handläufe (2a, 2b) einen kreisförmigen Querschnitt mit einem Durchmesser größer als die minimale Distanz zwischen dem ersten und dem zweiten Arm (7a, 7b) des ersten und des zweiten Beschränkungselements aufweist,

und wobei die gegenüberliegenden Enden des ersten und zweiten Arms (7a, 7b) des ersten und des zweiten Beschränkungselements (6a, 6b) bei einer minimalen Distanz größer als eine maximale Gesamtabmessung des Querschnitts von jeder Sprosse (4) angeordnet sind.

9. Leiter nach einem der vorhergehenden Ansprüche 5 bis 8, wobei der Zwischenraum (8) des ersten Beschränkungselements (6a) in dem ersten Betriebszustand des ausfahrbaren Handlaufs (5a) dazu eingerichtet ist, die Sprossen (4) dahindurchlaufend aufzunehmen,

wobei der Zwischenraum (8) des zweiten Beschränkungselements (6b) in dem ersten Betriebszustand des ausfahrbaren Hilfs-Handlaufs (5b) dazu eingerichtet ist, die Sprossen (4) dahindurchlaufend aufzunehmen.

10. Leiter nach einem der vorhergehenden Ansprüche, wobei der ausfahrbare Handlauf (5a) wenigstens während des Übergangs zwischen dem ersten und zweiten Betriebszustand rotierbar um den länglichen Körper (3) des ersten festen Handlaufs (2a) bewegbar ist, und/oder

wobei der ausfahrbare Hilfs-Handlauf (5b) wenigstens während des Übergangs zwischen dem ersten und dem zweiten Betriebszustand rotierbar um den länglichen Körper (3) des zweiten festen Handlaufs (2b) bewegbar ist.

11. Leiter nach einem der vorhergehenden Ansprüche von 5 bis 10, wobei der ausfahrbare Handlauf (5a) wenigstens während des Übergangs zwischen dem ersten und zweiten Betriebszustand um den länglichen Körper (3) des ersten festen Handlaufs (2a) bewegbar ist, und wobei das erste Beschränkungselement (6a) in dem zweiten Betriebszustand des

ausfahrbaren Handlaufs (5a) in Kontakt mit, optional oberhalb, einer Sprosse (4) angeordnet ist, wobei der ausfahrbare Hilfs-Handlauf (5b) wenigstens während des Übergangs zwischen dem ersten und dem zweiten Betriebszustand rotierbar um den länglichen Körper (3) des zweiten festen Handlaufs (2b) bewegbar ist, und wobei das zweite Beschränkungselement (6b) in dem zweiten Betriebszustand des ausfahrbaren Hilfs-Handlaufs (5b) in Kontakt mit, optional oberhalb, einer Sprosse (4) angeordnet ist.

12. Leiter nach einem der vorhergehenden Ansprüche von 4 bis 11, wobei der ausfahrbare Handlauf (5a) wenigstens ein jeweiliges Stoppelement (9) aufweist, welches dazu eingerichtet ist, wenigstens in dem zweiten Betriebszustand des ausfahrbaren Handlaufs (5a) mit einer Sprosse (4) zusammenzuwirken und wenigstens teilweise die Rotation des ausfahrbaren Handlaufs (5a) um den länglichen Körper (3) des ersten festen Handlaufs (2a) herum zu verhindern,

und wobei der ausfahrbare Hilfs-Handlauf (5b) wenigstens ein entsprechendes Stoppelement (9) aufweist, welches dazu eingerichtet ist, wenigstens in dem zweiten Betriebszustand des ausfahrbaren Hilfs-Handlaufs (5b) mit einer Sprosse (4) zusammenzuwirken und wenigstens teilweise die Rotation des ausfahrbaren Hilfs-Handlaufs (5b) um den länglichen Körper (3) des zweiten festen Handlaufs (2b) herum zu verhindern,

wobei jedes Stoppelement (9) des ausfahrbaren Handlaufs (5a) wenigstens ein Reliefelement umfasst, optional einen Stift, welches transversal von dem ersten Beschränkungselement (6a) vorsteht, optional transversal von wenigstens einem aus dem ersten und zweiten Arm (7a, 7b) vorsteht,

und wobei jedes Stoppelement (9) des ausfahrbaren Hilfs-Handlaufs (5b) wenigstens ein Reliefelement umfasst, optional einen Stift, welches transversal von dem zweiten Beschränkungselement (6b) vorsteht, optional transversal von wenigstens einem aus dem ersten und zweiten Arm (7a, 7b) vorsteht.

13. Leiter nach dem vorhergehenden Anspruch, wobei wenigstens eine Sprosse (4) in dem zweiten Betriebszustand des ausfahrbaren Handlaufs (5a) zwischen dem Stoppelement (9) des ersten Beschränkungselements (6a) und dem ausfahrbaren Handlauf (5a) eingefügt ist,

wobei wenigstens eine Sprosse (4) in dem zweiten Betriebszustand des ausfahrbaren Hilfs-Handlaufs (5b) zwischen dem Stoppelement (9)

des zweiten Beschränkungselements (6b) und dem ausfahrbaren Hilfs-Handlauf (5b) eingefügt ist, wobei das Stoppelement (9) des ersten Beschränkungselements (6a) ein erstes und ein zweites Stoppelement (9a, 9b) umfasst, welche gesondert und beabstandet voneinander sind, wobei das erste und zweite Stoppelement (9a, 9b) einen Sitz (10) definieren, welcher wenigstens in dem zweiten Betriebszustand des ausfahrbaren Handlaufs (5a) dazu eingerichtet ist, eine Sprosse (4) dahinein eingesetzt aufzunehmen, wobei das Stoppelement (9) des zweiten Beschränkungselements (6b) ein erstes und ein zweites Stoppelement (9a, 9b) gesondert und beabstandet voneinander umfasst, wobei das erste und zweite Stoppelement (9a, 9b) einen Sitz (10) definieren, welcher wenigstens in dem zweiten Betriebszustand des ausfahrbaren Hilfs-Handlaufs (5b) dazu eingerichtet ist, eine Sprosse (4) dahinein eingesetzt aufzunehmen, wobei optional das erste und das zweite Stoppelement (9a, 9b) des ersten und zweiten Beschränkungselements (6a, 6b) bei einer minimalen Distanz angeordnet sind, welche größer als eine maximale Gesamtabmessung des Querschnitts von jeder Sprosse (4) ist.

14. Leiter nach dem vorhergehenden Anspruch, wobei das erste Beschränkungselement (6a) derart eingerichtet ist, dass die Verlagerung des ausfahrbaren Handlaufs (5a) von dem zweiten zu dem ersten Betriebszustand nach der Verlagerung des ausfahrbaren Handlaufs (5a) transversal zu den Sprossen auftritt, insbesondere parallel zu dem ersten festen Handlauf, um so die Sprosse (4) von dem Sitz (10) des ersten Beschränkungselements (6a) zu trennen, und wobei das zweite Beschränkungselement (6b) derart eingerichtet ist, dass die Verlagerung des ausfahrbaren Hilfs-Handlaufs (5b) von dem zweiten zu dem ersten Betriebszustand nach der Verlagerung des ausfahrbaren Hilfs-Handlaufs (5b) transversal zu den Sprossen auftritt, insbesondere parallel zu dem zweiten festen Handlauf, um so die Sprosse (4) von dem Sitz (10) des zweiten Beschränkungselements (6b) zu trennen.

15. Boot (50), umfassend:

- wenigstens einen Rumpf (54), welcher von einem Umfangsrand (55) begrenzt ist,
- eine Leiter (1) nach einem der Ansprüche, welche mit dem Rumpf an dem Umfangsrand (55) eingreift, um ein Betreten des Boots zu erlauben;
- und/oder
- wenigstens einen Schacht (51) für einen Zugang zu einer Unterdeck-Umgebung des Boots,

wobei der Schacht (51) durch eine Seitenwand (14) begrenzt ist, welche eine Durchgangsöffnung (52) für einen Benutzer definiert, - eine Leiter (1) nach einem der vorhergehenden Ansprüche, welche mit der Seitenwand (14) des Schachts (51) eingreift; wobei insbesondere:

- in dem ersten Betriebszustand der ausfahrbare Handlauf (5a) in der ausgefahrenen Position davon positionierbar ist, in welcher er wenigstens teilweise außerhalb des Schachts (51) durch die Durchgangsöffnung (52) verlaufend angeordnet ist, wobei optional wenn der ausfahrbare Handlauf (5a) in der ausgefahrenen Position davon ist, sich ein Teil wenigstens 1/4 oder wenigstens 1/3 lang der longitudinalen Erstreckung des ausfahrbaren Handlaufs (5a) oberhalb der Zugangsöffnung (52) erstreckt; und wobei der ausfahrbare Handlauf (5a) in der ausgefahrenen Position von dem ersten zu dem zweiten Betriebszustand verlagerbar ist, um so das Absinken des ausfahrbaren Handlaufs in Richtung der abgesenkten Position davon zu verhindern, wobei der ausfahrbare Handlauf nicht oder leicht von der Durchgangsöffnung (52) vorsteht und innerhalb des Schachts (51) angeordnet ist,
- in dem ersten Betriebszustand der ausfahrbare Hilfs-Handlauf (5b) in der ausgefahrenen Position davon positionierbar ist, in welcher er wenigstens teilweise außerhalb des Schachts (51) durch die Durchgangsöffnung (52) verlaufend angeordnet ist, wobei optional wenn der ausfahrbare Hilfs-Handlauf (5b) in der ausgefahrenen Position davon ist, sich ein Teil von wenigstens 1/4 oder wenigstens 1/3 lang der longitudinalen Erstreckung des ausfahrbaren Hilfs-Handlaufs (5b) oberhalb der Zugangsöffnung (52) erstreckt; und wobei der ausfahrbare Hilfs-Handlauf (5b) in der ausgefahrenen Position von dem ersten zu dem zweiten Betriebszustand verlagerbar ist, um so das Absinken des ausfahrbaren Hilfs-Handlaufs in Richtung der abgesenkten Position davon zu verhindern, wobei der ausfahrbare Hilfs-Handlauf nicht oder leicht von der Zugangsöffnung (52) vorsteht und innerhalb des Schachts (51) angeordnet ist;

wobei weiter insbesondere:

- jeder aus dem ersten und zweiten festen Handlauf (2a, 2b) einen oberen Abschnitt (13) von jeder Leiter sich transversal zu dem

länglichen Körper beginnend von dem oberen Ende (3b) erstreckend aufweist, wobei der obere Abschnitt jeden aus dem ersten und zweiten festen Handlauf (2a, 2b) an die Seitenwand (14) des Schachts (51) oder des Umfangsrandes (55) des Boots beschränkt,

- der Unterdeck-Bereich des Boots eine Basisebene (16) aufweist, und wobei jeder aus dem ersten und zweiten festen Handlauf (2a, 2b) der Leiter mit der Basisebene (16) an dem unteren Ende (3a) des entsprechenden länglichen Körpers (3) eingreift, - optional das Boot (50) eine Schließtür (53) des Schachts umfasst, und wobei mit dem ausfahrbaren Handlauf und dem ausfahrbaren Hilfs-Handlauf (5a, 5b) in den abgesenkten Positionen davon die Schließtür in einer Position für ein Schließen, optional in einer flüssigkeitsdichten Weise, der Zugangsöffnung (52) positioniert werden kann.

Revendications

1. Échelle comprenant :

- une première et une seconde main courante fixe (2a, 2b) dont chacune présente un corps allongé (3) s'étendant entre une extrémité inférieure et une extrémité supérieure (3a, 3b),
- un nombre prédéfini de barreaux (4) transversalement engagés au niveau de la première et de la seconde main courante fixe (2a, 2b),
- au moins une main courante extensible (5a) engagée au niveau du corps allongé (3) de la première main courante fixe (2a), la main courante extensible (5a) étant configurée pour être positionnée par rapport à la première main courante fixe (2a) au moins entre :

- un premier état fonctionnel dans lequel la main courante extensible (5a) est mobile le long d'au moins une portion du corps allongé (3) de la première main courante fixe (2a), et
- un second état fonctionnel dans lequel la main courante extensible (5a) est configurée pour interférer avec au moins un barreau (4) qui limite ou qui bloque sa mobilité le long du corps allongé (3) de la première main courante fixe (2a),

la main courante extensible (5a) ayant au moins un premier élément de contrainte (6a) engagé de manière à pouvoir coulisser au niveau du corps allongé (3) de la première main courante

fixe (2a),

caractérisée en ce que ledit au moins un premier élément de contrainte (6a) présente :

- un corps principal (7) transversalement engagé au niveau de la main courante extensible (5a),
- un premier et un second bras (7a, 7b) se projetant comme une extension du corps principal, distincts et espacés l'un de l'autre ;

un espace intermédiaire (8) étant défini entre des extrémités respectives du premier et du second bras (7a, 7b) opposés au corps principal (7) ; et
le premier et le second bras (7a, 7b) du premier élément de contrainte (6a) définissant une assise (20) configurée pour loger au moins partiellement le corps allongé (3) de la première main courante fixe (2a).

2. Échelle selon la revendication précédente, comprenant une main courante extensible auxiliaire (5b) engagée au niveau du corps allongé (3) de la seconde main courante fixe (2b), la main courante extensible auxiliaire (5b) étant configurée pour être positionnée par rapport à la seconde main courante fixe (2b) au moins entre :

- un premier état fonctionnel dans lequel la main courante extensible auxiliaire (5b) est mobile le long d'au moins une portion du corps allongé (3) de la seconde main courante fixe (2b),
- un second état fonctionnel dans lequel la main courante extensible auxiliaire (5b) est configurée pour interférer avec au moins un barreau (4) qui limite ou qui bloque sa mobilité le long du corps allongé (3) de la seconde main courante fixe (2b).

3. Échelle selon la revendication précédente, la main courante extensible (5a) étant mobile indépendamment de la main courante extensible auxiliaire (5b), particulièrement dans laquelle il n'existe aucun raccordement mécanique rigide entre la main courante extensible (5a) et la main courante extensible auxiliaire (5b) qui contraint les deux mains courantes à être mobiles de manière synchrone.

4. Échelle selon la revendication 2 ou 3 :

- la main courante extensible (5a) comprenant deux ou plusieurs premiers éléments de contrainte (6a) engagés de manière à pouvoir coulisser au niveau de portions distinctes du corps allongé (3) de la première main courante fixe (2a), et

- la main courante extensible auxiliaire (5b) comprenant deux ou plusieurs seconds éléments de contrainte (6b) engagés de manière à pouvoir coulisser au niveau de portions distinctes du corps allongé (3) de la seconde main courante fixe (2b).
- 5
5. Échelle selon la revendication précédente, chaque second élément de contrainte (6a, 6b) ayant :
- 10
- un corps principal (7) transversalement engagé au niveau de la main courante extensible (5a) ou avec la main courante extensible auxiliaire (5b),
 - un premier et un second bras (7a, 7b) se projetant comme une extension du corps principal, distincts et espacés l'un de l'autre ; et dans lesquels un espace intermédiaire (8) est défini entre des extrémités respectives du premier et du second bras (7a, 7b) opposés au corps principal (7),
- 15
- 20
- le premier et le second bras (7a, 7b) du second élément de contrainte (6b) définissant une assise (20) configurée pour loger au moins partiellement le corps allongé (3) de la seconde main courante fixe (2b).
- 25
6. Échelle selon la revendication précédente, l'assise (20) du premier élément de contrainte (6a) ayant, en section transversale, une portion prédominante de son profil mise en forme de manière complémentaire par rapport à un profil dans le périmètre de la section transversale du corps allongé (3) de la première main courante fixe (2a),
- 30
- et l'assise (20) du second élément de contrainte (6b) ayant, en section transversale, une portion prédominante de son profil mise en forme de manière complémentaire par rapport à un profil dans le périmètre de la section transversale du corps allongé (3) de la seconde main courante fixe (2b).
- 35
7. Échelle selon l'une quelconque des deux revendications précédentes, le corps principal (7) d'un premier et d'un second élément de contrainte (6a, 6b) respectifs définissant, en coopération avec le premier et le second bras (7a, 7b), un corps rigide unique,
- 40
- l'espace intermédiaire (8) du premier élément de contrainte (6a) étant configuré pour empêcher le retrait du corps allongé (3) de la première main courante fixe (2a) de l'assise (20),
- 45
- et l'espace intermédiaire (8) du second élément de contrainte (6b) étant configuré pour empêcher le retrait du corps allongé (3) de la seconde main courante fixe (2b) de l'assise (20).
- 50
8. Échelle selon l'une quelconque des trois revendications précédentes, les extrémités opposées du premier et du second bras (7a, 7b) du premier élément de contrainte (6a) étant agencées sous une distance minimale inférieure à la dimension globale minimale de la section transversale du corps allongé de la première main courante fixe (2a),
- 55
- et les extrémités opposées du premier et du second bras (7a, 7b) du second élément de contrainte (6b) étant agencées sous une distance minimale inférieure à la dimension globale minimale de la section transversale du corps allongé de la seconde main courante fixe (2b), éventuellement, le corps allongé (3) de la première et de la seconde main courante fixe (2a, 2b) ayant une section transversale de forme circulaire ayant un diamètre supérieur à la distance minimale entre le premier et le second bras (7a, 7b) du premier et du second élément de contrainte,
- et les extrémités opposées desdits premier et second bras (7a, 7b) du premier et du second élément de contrainte (6a, 6b) étant agencées sous une distance minimale supérieure à une dimension globale maximale de la section transversale de chaque barreau (4).
9. Échelle selon l'une quelconque des revendications précédentes 5 à 8, l'espace intermédiaire (8) du premier élément de contrainte (6a), dans le premier état fonctionnel de la main courante extensible (5a), étant configuré pour recevoir les barreaux (4) passant à travers,
- ledit espace intermédiaire (8) du second élément de contrainte (6b), dans le premier état fonctionnel de la main courante extensible auxiliaire (5b), étant configuré pour recevoir les barreaux (4) passant à travers.
10. Échelle selon l'une quelconque des revendications précédentes, la main courante extensible (5a), au moins durant la transition entre le premier et le second état fonctionnel, étant mobile de manière à pouvoir tourner autour du corps allongé (3) de la première main courante fixe (2a), et/ou la main courante extensible auxiliaire (5b), au moins durant la transition entre le premier et le second état fonctionnel, étant mobile de manière à pouvoir tourner autour du corps allongé (3) de la seconde main courante fixe (2b).
11. Échelle selon l'une quelconque des revendications précédentes de 5 à 10, la main courante extensible (5a), au moins durant la transition entre le premier et le second état fonctionnel, étant mobile de manière à pouvoir tourner autour du corps allongé (3) de la première main courante fixe (2a), et le premier élément de contrainte (6a), dans le second état fonc-

tionnel de la main courante extensible (5a), étant agencé en contact avec, éventuellement au-dessus de, un barreau (4),

la main courante extensible auxiliaire (5b), au moins durant la transition entre le premier et le second état fonctionnel, étant mobile de manière à pouvoir tourner autour du corps allongé (3) de la seconde main courante fixe (2b) et le second élément de contrainte (6b), dans le second état fonctionnel de la main courante extensible auxiliaire (5b), étant agencé en contact avec, éventuellement au-dessus de, un barreau (4).

12. Échelle selon l'une quelconque des revendications précédentes de 4 à 11, la main courante extensible (5a) ayant au moins un élément d'arrêt (9) respectif configuré pour interférer, au moins dans le second état fonctionnel de la main courante extensible (5a), avec un barreau (4) et empêcher au moins partiellement la rotation de la main courante extensible (5a) autour du corps allongé (3) de la première main courante fixe (2a),

et la main courante extensible auxiliaire (5b) ayant au moins un élément d'arrêt (9) respectif configuré pour interférer, au moins dans le second état fonctionnel de la main courante extensible auxiliaire (5b), avec un barreau (4) et empêcher au moins partiellement la rotation de la main courante extensible auxiliaire (5b) autour du corps allongé (3) de la seconde main courante fixe (2b),

chaque élément d'arrêt (9) de la main courante extensible (5a) comprenant au moins un relief, éventuellement une goupille, se projetant transversalement depuis le premier élément de contrainte (6a), éventuellement se projetant transversalement depuis au moins l'un desdits premier et second bras (7a, 7b),

et chaque élément d'arrêt (9) de la main courante extensible auxiliaire (5b) comprenant au moins un relief, éventuellement une goupille, se projetant transversalement depuis le second élément de contrainte (6b), éventuellement se projetant transversalement depuis au moins l'un desdits premier et second bras (7a, 7b).

13. Échelle selon la revendication précédente, au moins un barreau (4), dans le second état fonctionnel de la main courante extensible (5a), étant interposé entre l'élément d'arrêt (9) du premier élément de contrainte (6a) et la main courante extensible (5a),

au moins un barreau (4), dans le second état fonctionnel de la main courante extensible auxiliaire (5b), étant interposé entre l'élément d'arrêt (9) du second élément de contrainte (6b) et la main courante extensible auxiliaire (5b),

ledit élément d'arrêt (9) du premier élément de contrainte (6a) comprenant un premier et un second élément d'arrêt (9a, 9b) distincts et espacés l'un de l'autre, lesdits premier et second élément d'arrêt (9a, 9b) définissant une assise (10) qui, au moins dans le second état fonctionnel de la main courante extensible (5a), est configurée pour recevoir un barreau (4) inséré à l'intérieur,

l'élément d'arrêt (9) du second élément de contrainte (6b) comprenant un premier et un second élément d'arrêt (9a, 9b) distincts et espacés l'un de l'autre, lesdits premier et second élément d'arrêt (9a, 9b) définissant une assise (10) qui, au moins dans le second état fonctionnel de la main courante extensible auxiliaire (5b), est configurée pour recevoir un barreau (4) inséré à l'intérieur,

éventuellement le premier et le second élément d'arrêt (9a, 9b) de chacun desdits premier et second élément de contrainte (6a, 6b) étant agencés sous une distance minimale supérieure à une dimension globale maximale de la section transversale de chaque barreau (4).

14. Échelle selon la revendication précédente, le premier élément de contrainte (6a) étant configuré de sorte que le déplacement de la main courante extensible (5a) depuis le second vers le premier état fonctionnel se produit après le déplacement de la main courante extensible (5a) transversalement auxdits barreaux, en particulier parallèle à la première main courante fixe, afin de désengager le barreau (4) de l'assise (10) du premier élément de contrainte (6a),

et le second élément de contrainte (6b) étant configuré de sorte que le déplacement de la main courante extensible auxiliaire (5b) depuis le second vers le premier état fonctionnel se produit après le déplacement de la main courante extensible auxiliaire (5b) transversalement auxdits barreaux, en particulier parallèlement à la seconde main courante fixe, afin de désengager le barreau (4) de l'assise (10) du second élément de contrainte (6b).

15. Bateau (50) comprenant :

- au moins une coque (54) délimitée par un bord dans le périmètre (55),
- une échelle (1) selon l'une quelconque des revendications engagée au niveau de la coque au niveau du bord dans le périmètre (55) pour permettre d'aborder le bateau ; et/ou
- au moins un puits (51) pour accéder à un environnement sous le pont du bateau, ledit puits (51) étant délimité par une paroi latérale (14) définissant une ouverture de passage (52) pour un utilisateur,

- une échelle (1) selon l'une quelconque des revendications précédentes engagée au niveau de la paroi latérale (14) du puits (51) ;
en particulier :

- dans le premier état fonctionnel, la main courante extensible (5a) pouvant être positionnée dans sa position étendue dans laquelle elle est agencée au moins partiellement à l'extérieur du puits (51) passant à travers l'ouverture de passage (52), éventuellement lorsque la main courante extensible (5a) se trouve dans sa position étendue, une partie d'au moins 1/4 ou d'au moins 1/3 le long de l'extension longitudinale de la main courante extensible (5a) s'étendant au-dessus de l'ouverture de passage (52) ; et ladite main courante extensible (5a), dans la position étendue, pouvant être déplacée depuis le premier vers le second état fonctionnel afin d'empêcher la descente de la main courante extensible vers sa position abaissée, la main courante extensible ne faisant pas saillie ou faisant légèrement saillie de l'ouverture de passage (52) et étant agencée à l'intérieur du puits (51),

- dans le premier état fonctionnel, la main courante extensible auxiliaire (5b) pouvant être positionnée dans sa position étendue dans laquelle elle est agencée au moins partiellement à l'extérieur du puits (51) passant à travers l'ouverture de passage (52), éventuellement lorsque la main courante extensible auxiliaire (5b) se trouve dans sa position étendue, une partie d'au moins 1/4 ou d'au moins 1/3 le long de l'extension longitudinale de la main courante extensible auxiliaire (5b) s'étendant au-dessus de l'ouverture de passage (52) ; et ladite main courante extensible auxiliaire (5b), dans la position étendue, pouvant être déplacée depuis le premier vers le second état fonctionnel afin d'empêcher la descente de la main courante extensible auxiliaire vers sa position abaissée, la main courante extensible auxiliaire ne faisant pas saillie ou faisant légèrement saillie de l'ouverture de passage (52) et étant agencée à l'intérieur du puits (51) ;

plus en particulier :

- chacune desdites première et seconde main courante fixe (2a, 2b) ayant une section supérieure (13) de chaque échelle s'étendant transversalement au corps allongé en commençant depuis l'extrémité

supérieure (3b), ladite section supérieure contraignant chacune desdites première et seconde main courante fixe (2a, 2b) à la paroi latérale (14) du puits (51) ou au bord dans le périmètre (55) du bateau,

- la zone sous le pont du bateau ayant un plan de base (16), et chacune desdites première et seconde main courante fixe (2a, 2b) de l'échelle étant engagée avec le plan de base (16) au niveau de l'extrémité inférieure (3a) du corps allongé (3) respectif,
- éventuellement, le bateau (50) comprenant une porte de fermeture (53) du puits, et avec la main courante extensible et la main courante extensible auxiliaire (5a, 5b) dans leurs positions abaissées, la porte de fermeture pouvant être positionnée dans une position pour la fermeture, éventuellement d'une manière étanche aux liquides, de l'ouverture de passage (52).

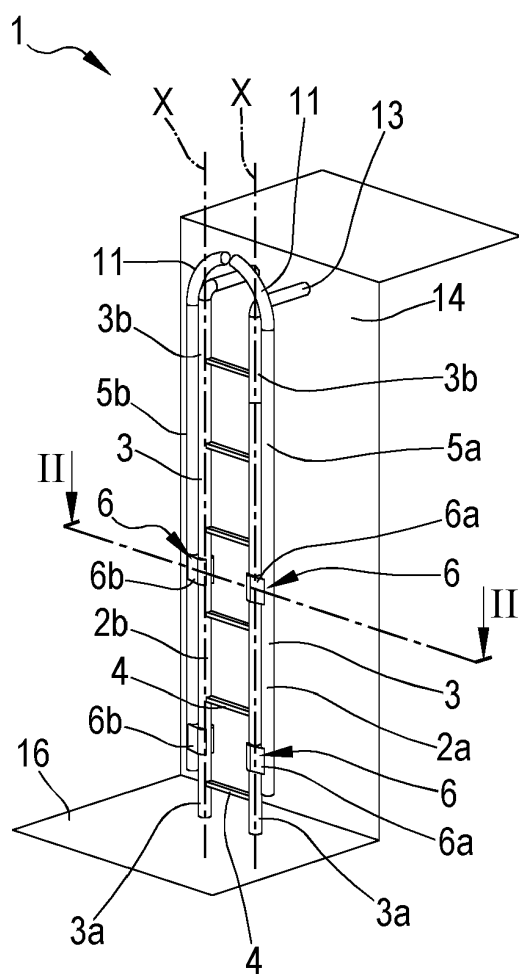


FIG. 1A

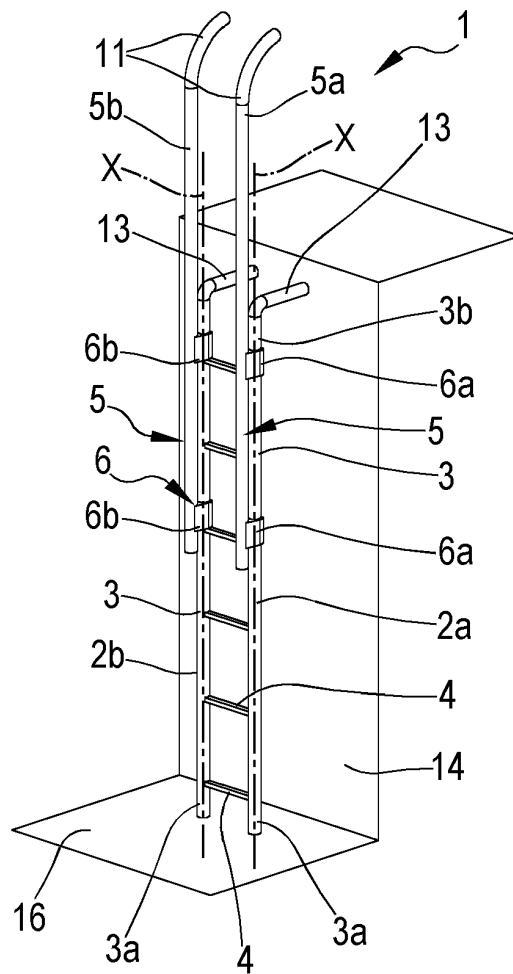


FIG. 1B

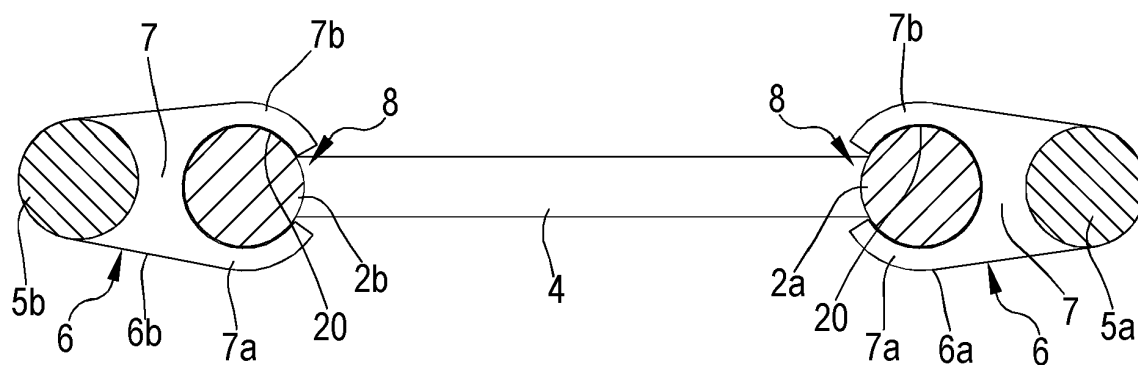


FIG. 2

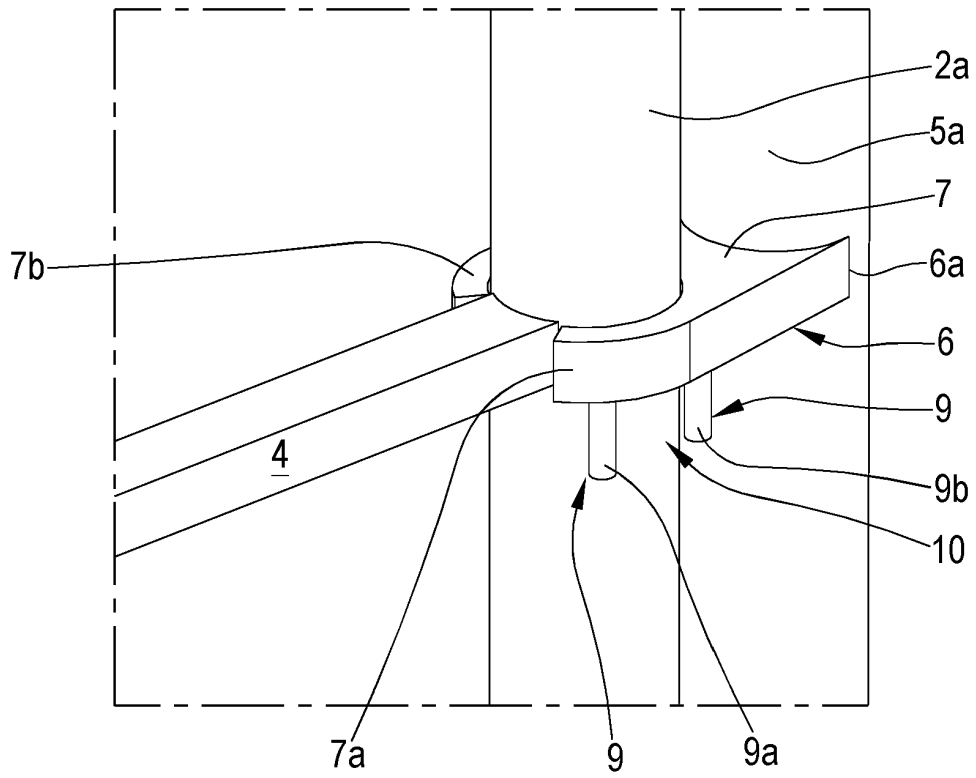


FIG.3

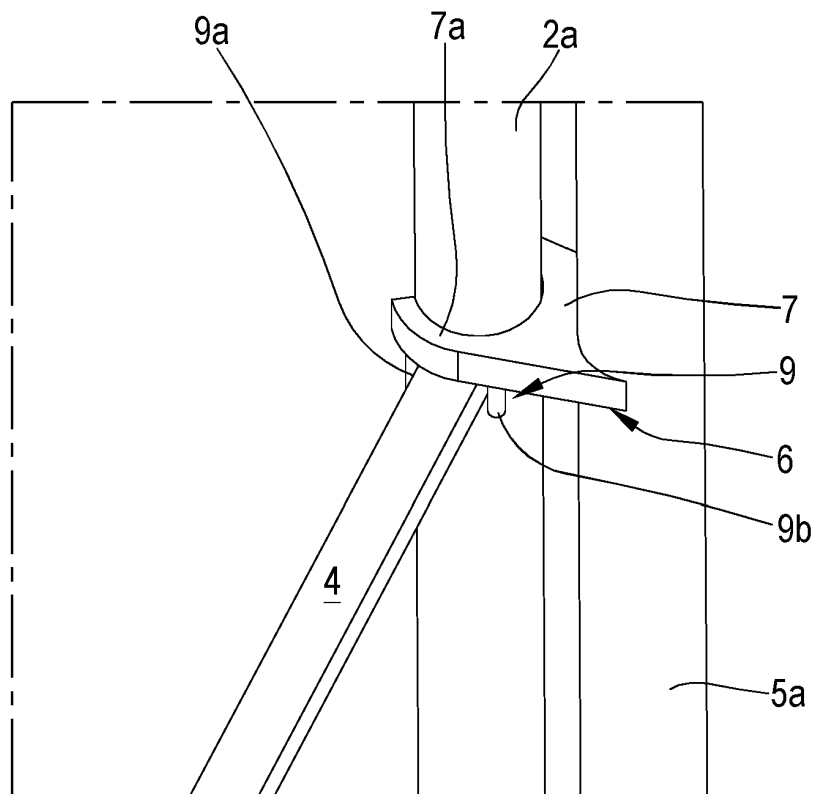


FIG.4

FIG.5

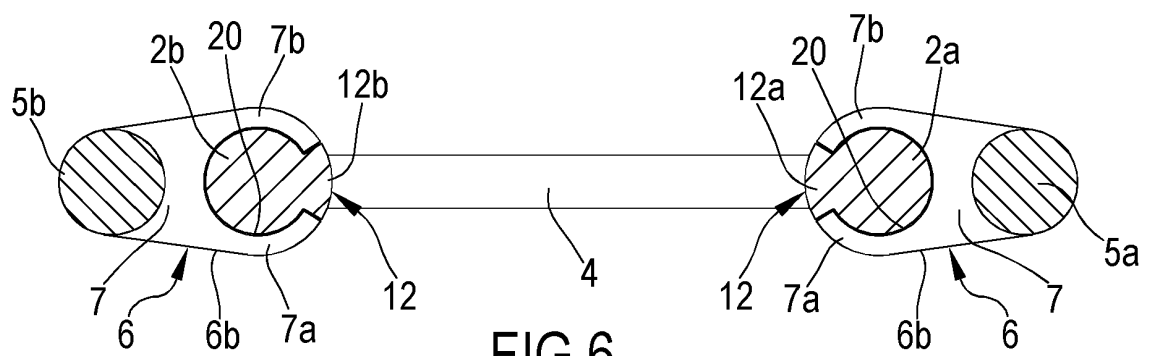
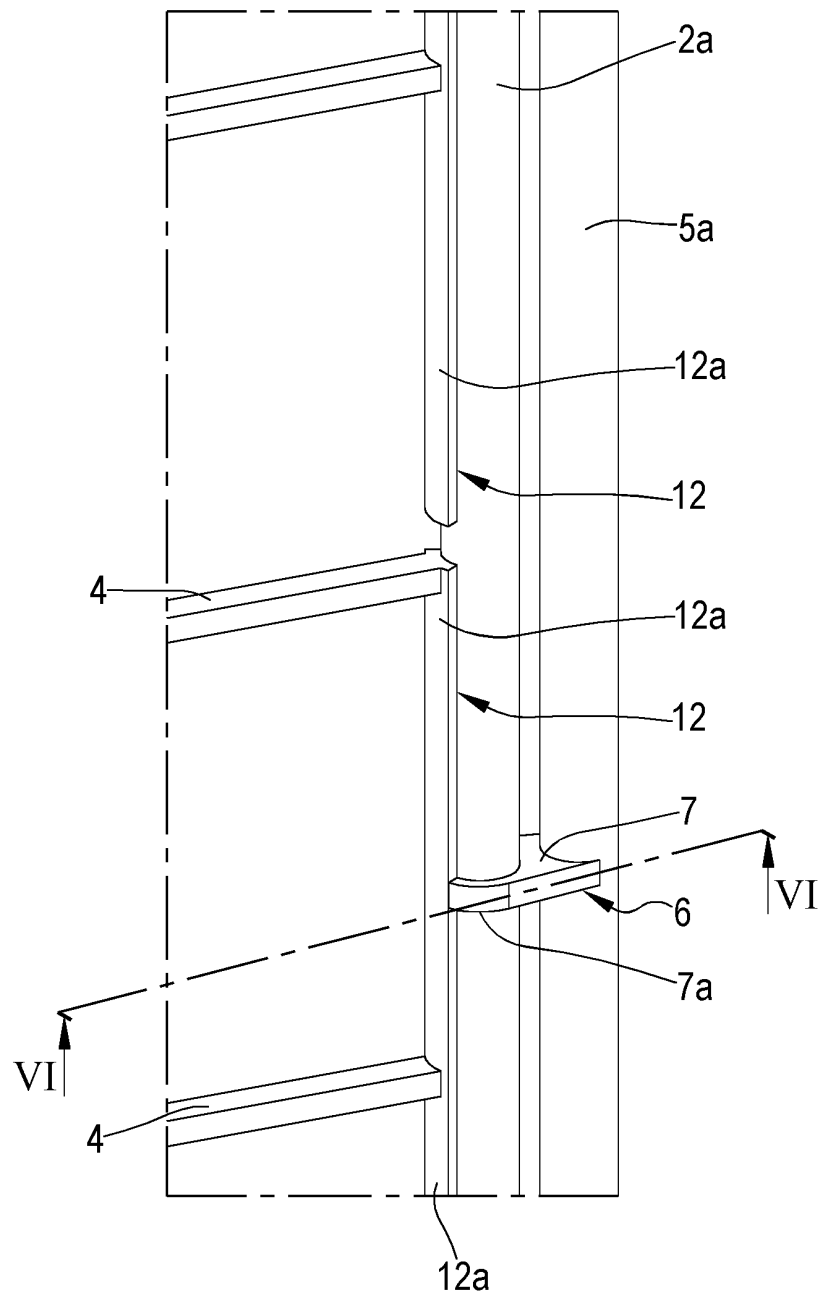


FIG.6

FIG. 7

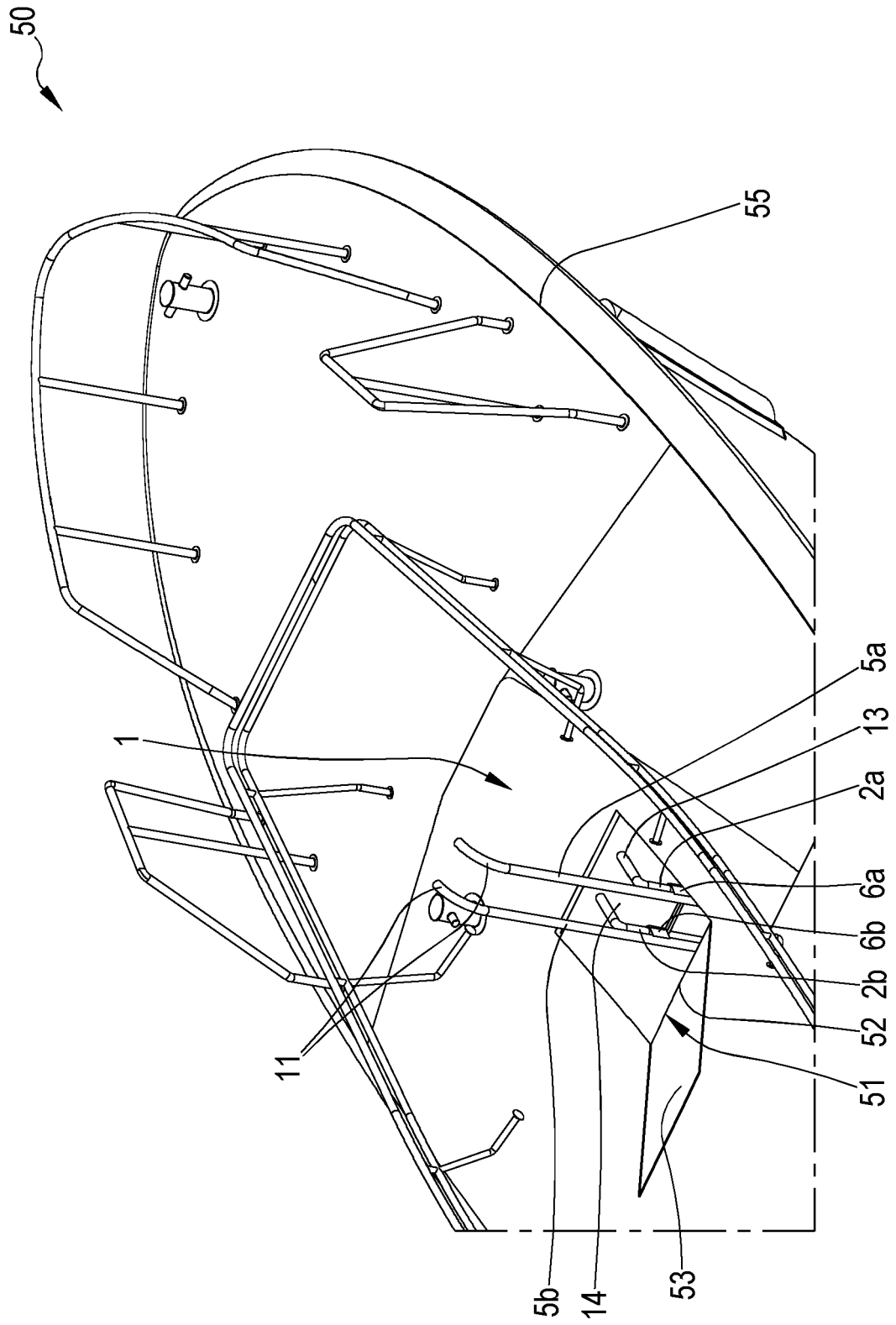


FIG.8

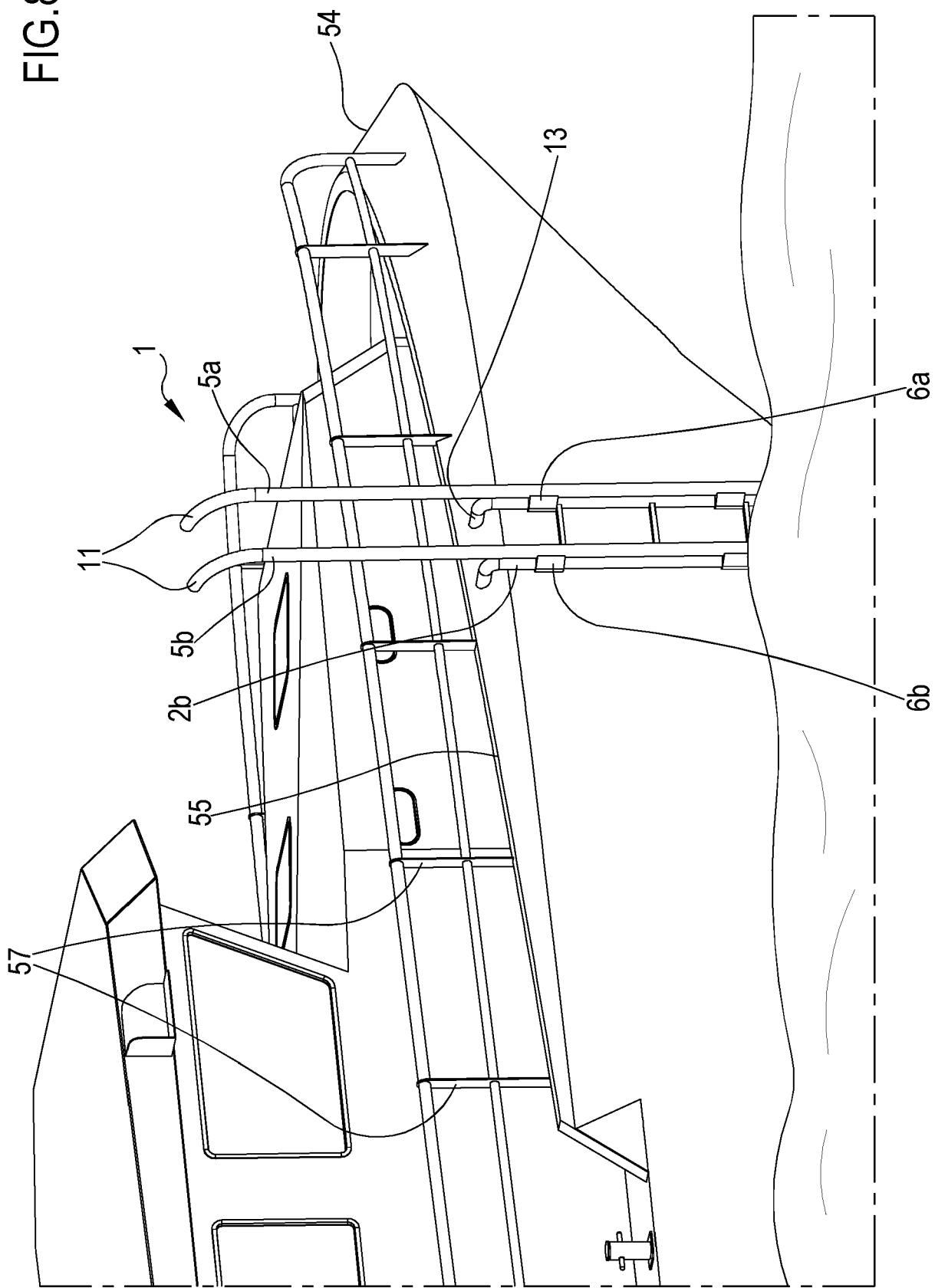
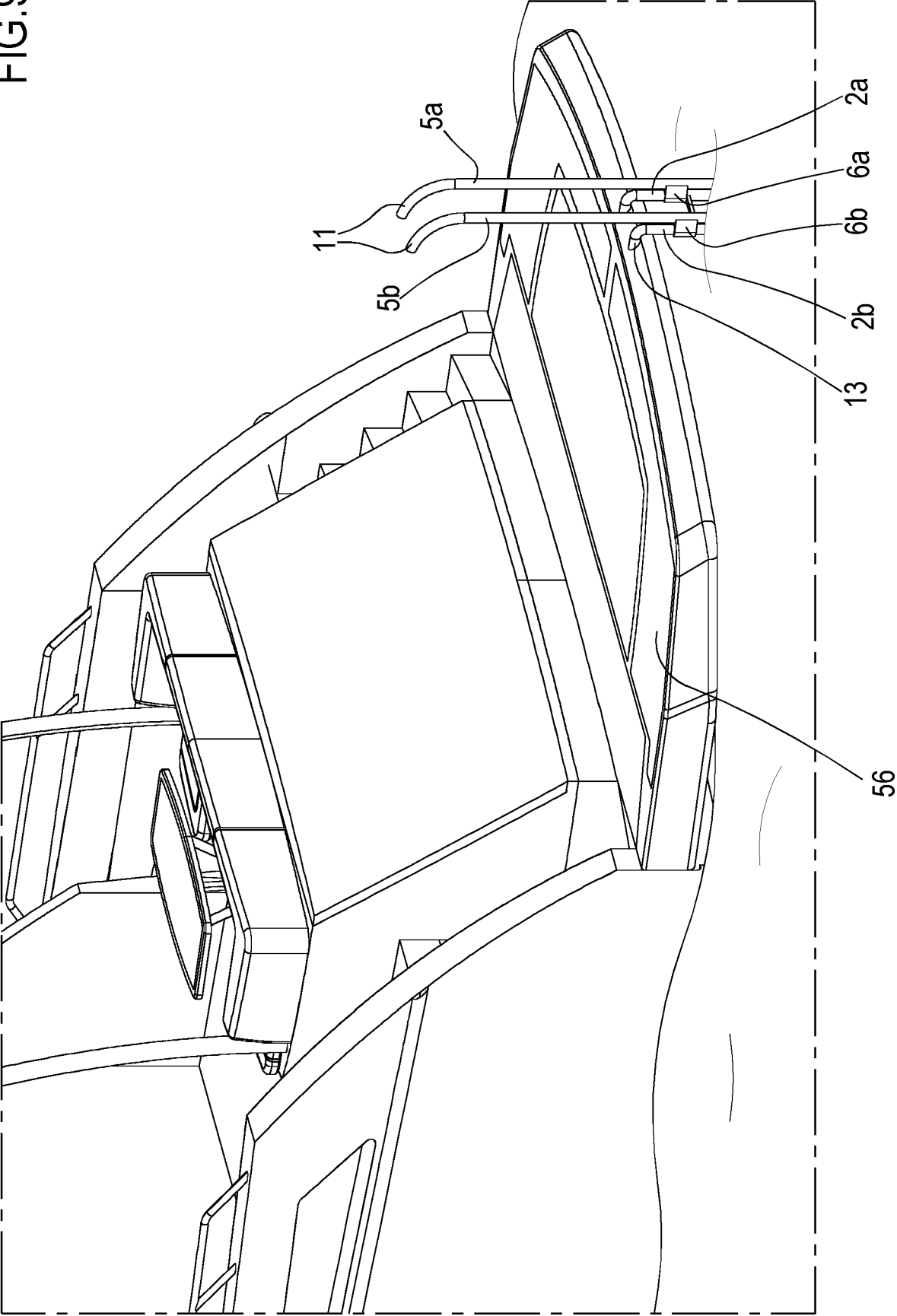


FIG.9



REFERENCES CITED IN THE DESCRIPTION

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