



US 20150059635A1

(19) **United States**(12) **Patent Application Publication**
FRITSCH et al.(10) **Pub. No.: US 2015/0059635 A1**(43) **Pub. Date: Mar. 5, 2015**(54) **BOW OF INFLATABLE BOAT**(71) Applicant: **DECATHLON**, Villeneuve D'ascq (FR)(72) Inventors: **Antoine FRITSCH**, Andresy (FR);
Vivien DURISOTTI, St Leu La Foret (FR)(21) Appl. No.: **14/470,956**(22) Filed: **Aug. 28, 2014**(30) **Foreign Application Priority Data**

Sep. 5, 2013 (FR) 13 58532

Publication Classification(51) **Int. Cl.**
B63B 7/08 (2006.01)
B63B 5/24 (2006.01)(52) **U.S. Cl.**CPC **B63B 7/08** (2020.01); **B63B 5/24** (2020.01)USPC **114/345**(57) **ABSTRACT**

The invention relates to a boat having a longitudinal direction, including a first bow, two inflatable lateral tubes extending according to the longitudinal direction of the boat, and an inflatable base arranged between the two inflatable lateral tubes. The inflatable base further comprises a floor portion, and at least one first pair of end portions extending from one of the two longitudinal ends of the floor portion. A fold line is formed between the floor portion and each of the end portions of the first pair, and when the inflatable base is in its inflated state, each end portion is in a position folded around the corresponding fold line to form the first bow of the boat.

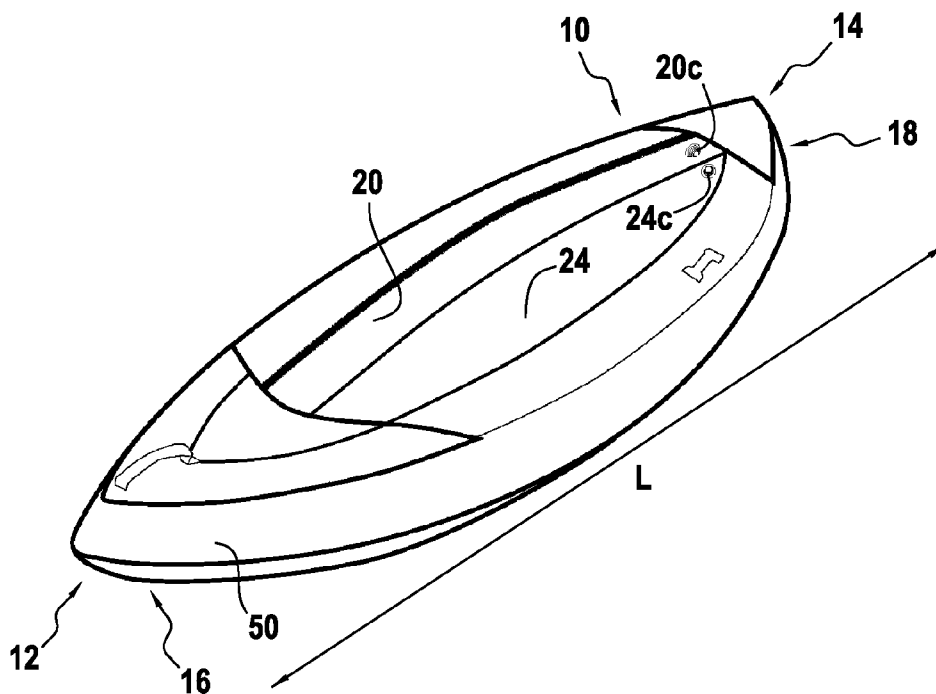


FIG.3

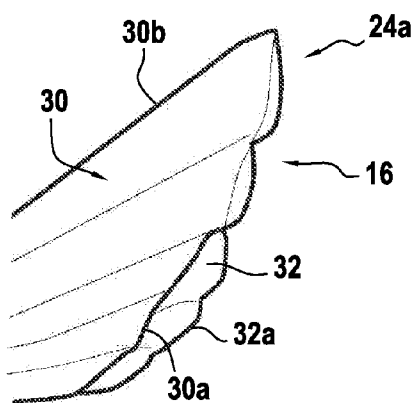


FIG. 4

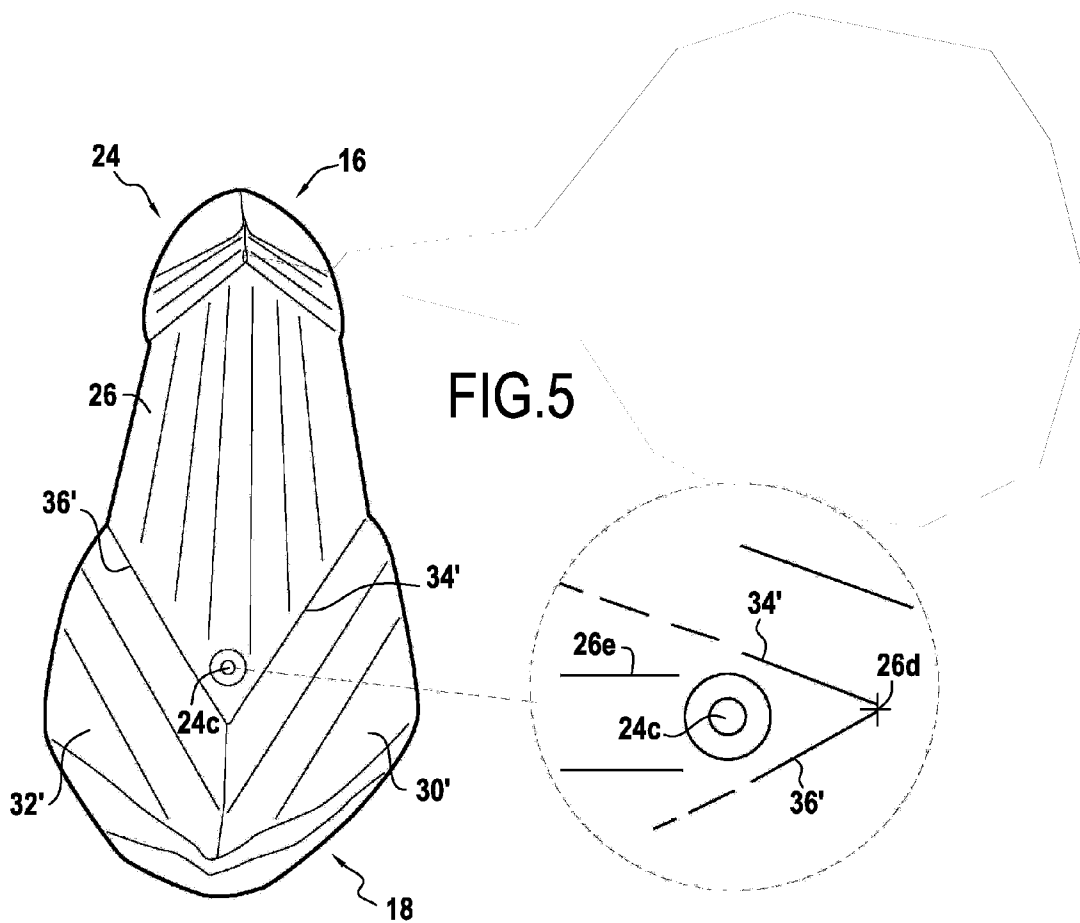


FIG. 5

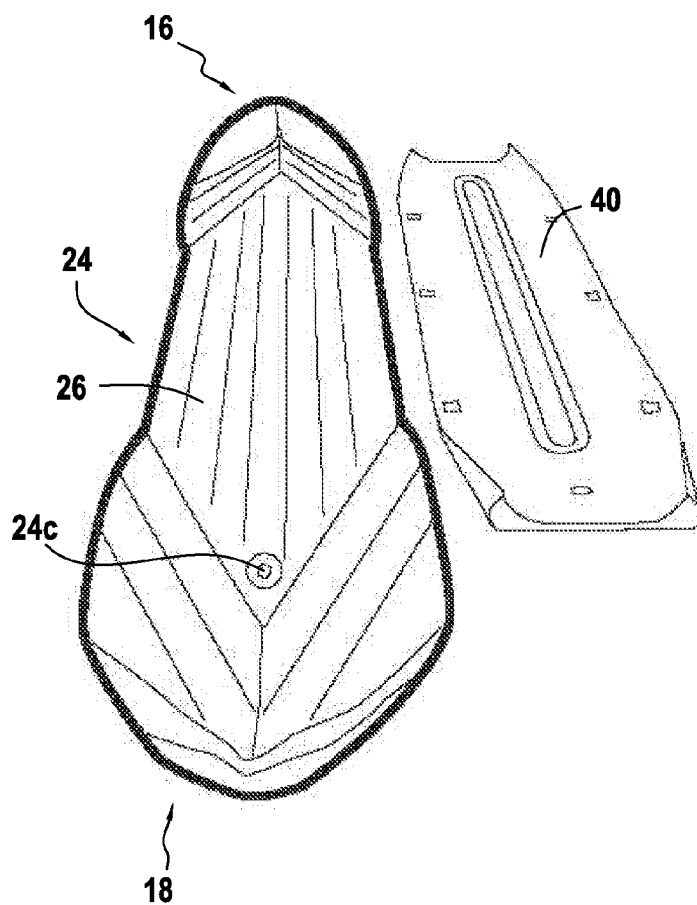
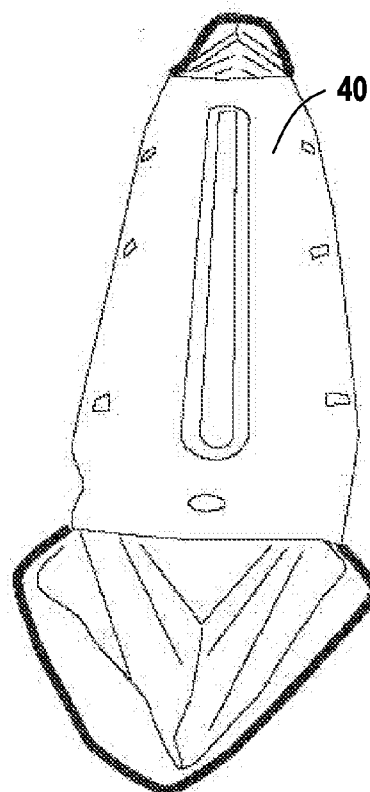
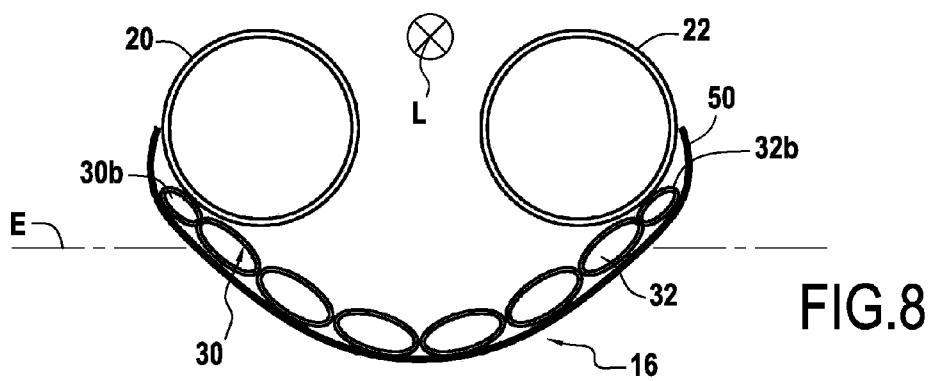
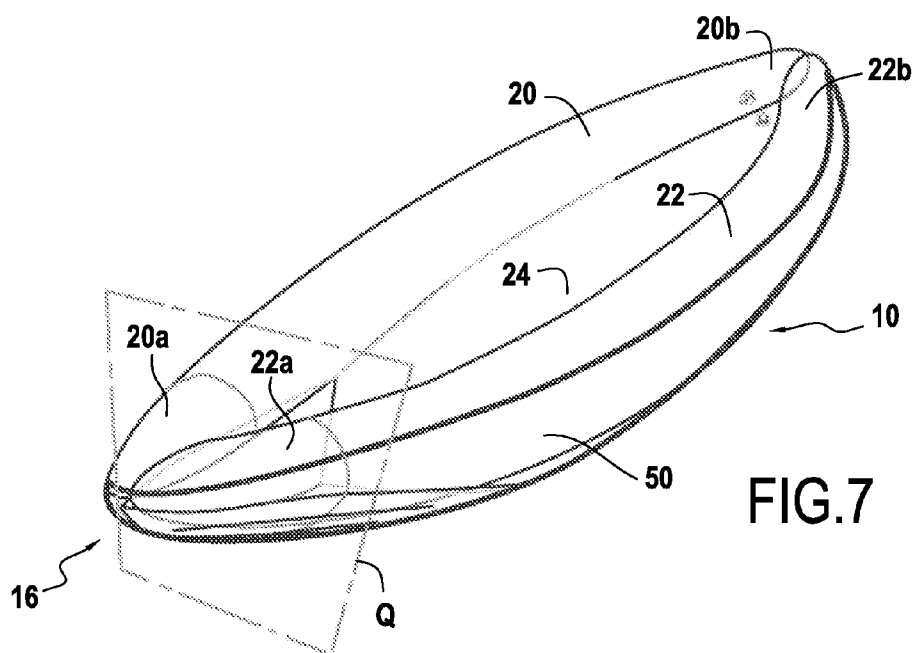


FIG. 6A

FIG. 6B





BOW OF INFLATABLE BOAT

BACKGROUND OF THE INVENTION

[0001] The present invention relates to the field of boating, and more particularly that of inflatable boats.

[0002] The invention relates especially, though not exclusively, to an inflatable boat of kayak, canoe, ship type or any other type of boat.

[0003] The invention refers more particularly to a boat having a longitudinal direction and comprising:

[0004] a first bow;

[0005] two inflatable lateral tubes extending according to the longitudinal direction of the boat;

[0006] an inflatable base arranged between the two lateral tubes.

[0007] In terms of the invention, the first bow is preferably situated at the prow of the boat. The invention also covers a boat capable of navigating in both directions such that the first bow can also be arranged at the level of the stern of the boat according to the direction of navigation of the boat.

[0008] Traditionally, the bow of such an inflatable boat is constituted by the ends in front of the lateral tubes which come into contact with each other to give a form in an arc of a circle enclosing the front end of the inflatable base, which is welded to the lateral tubes.

[0009] In known boats, the inflatable base forming the floor of the boat is generally arranged retracted from the end of the boat and projecting below the waterline. There is a disconnection between the front part of the floor and the tubes, the effect of which is to generate a considerable draught, penalising the advance of the boat and jeopardising the gliding quality of the boat. Because the floor is located below the waterline, substantial energy must be deployed by the user to advance the boat. This type of boat therefore has a hydrodynamic profile which is ineffective.

OBJECT AND SUMMARY OF THE INVENTION

[0010] An aim of the invention is to propose an inflatable boat which rectifies the above disadvantages by having a better hydrodynamic profile than that of the boat of the prior art, offering better gliding quality on water.

[0011] The invention achieves its aim by the fact that the inflatable base comprises a floor portion, and at least one first pair of end portions extending from one of the two longitudinal ends of the floor portion; a fold line is formed between the floor portion and each of the end portions of the first pair, and, when the inflatable base is in its inflated state, each end portion is in a position folded around the corresponding fold line to form the bow of the boat.

[0012] In this way, the inflatable base of the boat according to the invention forms the floor of the boat and the bow at the same time. It is understood that the bow is formed by folding of the two end portions, according to the fold lines after the inflatable base has been inflated, so as to bring one against the other.

[0013] The two end portions extend in two planes inclined relative to each other, and also relative to the plane in which the floor portion extends. This shaping rapidly forms the first bow of the boat.

[0014] Once formed, the first bow has a pointed volumic form having hydrodynamic resistance substantially less than that of the boat of the prior art.

[0015] Preferably, the two end portions are symmetrical to each other relative to a longitudinal plane perpendicular to the floor portion.

[0016] The end portions are advantageously in fluidic communication with the floor portion such that the inflation of the inflatable base causes inflation concomitant with the floor portion and end portions.

[0017] Advantageously, the lateral tubes are connected pieces separate from the inflatable base. The floor portion comprises longitudinal lateral sides on either side of which the lateral tubes extend.

[0018] Advantageously, the fold lines extend by forming a "V" at the longitudinal end of the floor portion, the point of the "V" being directed in a direction opposite the other longitudinal end of the floor portion. Put otherwise, the point of the V is directed towards the end of the boat where the first bow is located. It is also specified that the fold lines are preferably rectilinear but they could also be curved. These fold lines are inclined relative to the longitudinal direction of the boat. They are preferably symmetrical to each other relative to a longitudinal median plane of the floor portion. Preferably, the fold lines together form an angle, viewed from the side of the floor portion, of around between 30° and 120°.

[0019] These lateral sides of the floor portion are substantially rectilinear and extend from the ends of the fold lines.

[0020] Each of the end portions has a first edge, and the first edges of the two end portions are preferably fixed to each other, at least when the inflatable base is.

[0021] An interest is in maintaining the end portions in folded positions during mounting of the boat.

[0022] Preferably, the first edge extends from the point of the "V" formed by the fold lines.

[0023] Preferably, the first edges of the end portions are free to define an echancrure when the inflatable base is deflated and unfolded.

[0024] More preferably, each first edge has a rectilinear or, more preferably, convex form. An interest in the convex form is improving the hydrodynamic profile of the bow of the boat.

[0025] Each of the end portions also has a second edge which extends between the end of one of the lateral sides of the floor portion and the end of the first edge away from the end of the floor portion. This second edge advantageously has a convex form, which boosts the volume of the bow.

[0026] Advantageously, the inflatable lateral tubes have a curved form such that, when the inflatable lateral tubes and the inflatable base are inflated, the end portions extend underneath the longitudinal ends of the inflatable lateral tubes.

[0027] In this way, the longitudinal ends of the lateral tubes are again above the waterline, which increases the hydrodynamic resistance of the boat.

[0028] It is also understood that the lateral tubes extend parallel to the lateral sides of the floor portion.

[0029] Preferably, when the inflatable lateral tubes and the inflatable base are inflated the inflatable lateral tubes rest on the end portions. More precisely, the longitudinal ends of the inflatable lateral tubes rest at least on part on the second edges of the end portions.

[0030] Advantageously, the second edges of the end portions, in folded position, are arranged on either side of the two lateral tubes, such that the longitudinal ends of the lateral tubes are arranged inside the first bow.

[0031] Preferably, at the level of the floor portion the longitudinal ends of the lateral tubes have a transversal cross-section greater than that present at the level of the longitudinal ends.

[0032] Advantageously, the end portions comprise discontinuous weld lines delimiting a plurality of tubes. An interest is that, in their deflated state the end portions are plane, and easily handled to be put away.

[0033] Preferably, for each end portion the tubes are parallel to each other. Also, each end portion preferably comprises between four and seven tubes.

[0034] Preferably, the floor portion comprises a plurality of lines of continuous welds which extend according to a length slightly less than the length of the floor portion. These tubes are shaped during inflation of the inflatable base.

[0035] Advantageously, the fold line is a discontinuous weld, due to which the floor portion and the end portions are inflated together, enabling rapid assembly of the boat.

[0036] For easier inflation operation of the floor portion and the end portions, the inflatable base comprises at least one inflation valve arranged at least at one of the two longitudinal ends of the floor portion. The inflation valve is more particularly arranged near the point of the "V" formed by the fold lines. Preferably, each of the lateral tubes is inflated independently of each other, and independently of the inflatable base. For this to occur, each lateral tube comprises an inflation valve. The lateral tubes are therefore isolated fluidly from the inflatable base.

[0037] According to a preferred embodiment, the boat further comprises an external envelope in which the inflatable lateral tubes and the inflatable base are housed.

[0038] Preferably, the external envelope extends over all or part of the length of the boat.

[0039] For protecting the floor portion from any puncture, and for improving its hold relative to the inflatable lateral tubes, the floor portion is engaged in a cover designed to be fixed to the external envelope.

[0040] Advantageously, the inflatable base and/or the inflatable lateral tubes are constituted by a layer of PVC covered by a textile layer.

[0041] According to a variant, the inflatable base and/or the inflatable lateral tubes are made of coated material, for example PU.

[0042] According to an embodiment, the inflatable base is welded to the inflatable lateral tubes. In this embodiment, it is possible to do without the external envelope.

[0043] Advantageously, the inflatable base further comprises a second pair of end portions extending from the other longitudinal end of the floor portion, and the end portions of the second pair are arranged so as to be folded relative to the floor portion to form a second bow of the boat, opposite the first bow, when the inflatable base is in its inflated state.

[0044] Preferably, the first bow is situated at the prow of the boat, while the second bow is situated at the stern of the boat.

[0045] Advantageously, the first and second bows are symmetrical to each other relative to a plane perpendicular to the longitudinal direction of the boat.

BRIEF DESCRIPTION OF DRAWINGS

[0046] The invention will be more clearly understood from the following description of embodiments of the invention given by way of non-limiting examples in reference to the attached drawings, in which:

[0047] FIG. 1 is a perspective view of the boat according to the invention;

[0048] FIG. 2 is a plan view of the inflatable base of the boat of FIG. 1 in its non-inflated state;

[0049] FIG. 3 is a view of the inflatable base of FIG. 2, in its inflated state, the end portions being folded to form the first bow;

[0050] FIG. 4 is a view of a detail of the bow of FIG. 3;

[0051] FIG. 5 is a view of the inflatable base showing the position of the inflation valve of said inflatable base;

[0052] FIGS. 6A and 6B illustrate the inflatable base and the cover designed to enclose the floor portion;

[0053] FIG. 7 is a perspective view of the boat of FIG. 1 more particularly showing the inflatable lateral tubes and the inflatable base in their inflated states and engaged in the external envelope; and

[0054] FIG. 8 is a view in transversal section of the first bow of the boat of FIG. 7.

DETAILED DESCRIPTION OF THE INVENTION

[0055] FIG. 1 shows an inflatable boat 10 according to the present invention. In this example, it is a boat of canoe or kayak type.

[0056] The boat 10 extends according to a longitudinal direction L, and classically has a front part called a prow, referenced 12, and a rear part, called a stern, referenced 14.

[0057] The prow 12 comprises a first bow 16 which will be described in more detail herein below.

[0058] In this example, the stern 14 substantially has the same form as the prow 12, such that the stern 14 further comprises a bow, called a second bow 18, opposite the first bow. The boat 10 further comprises two inflatable lateral tubes 20, 22 which extend according to the longitudinal direction L of the boat 10, between the prow 12 and the stern 14. The length of the inflatable lateral tubes is substantially equal to the length of the boat.

[0059] Each of the lateral tubes 20, 22, also called "collar" or "sponson" has a substantially circular transversal cross-section. Each lateral tube has a curved form. In addition, each inflatable lateral tube 20, 22 comprises a longitudinal front end 20a, 22a, and a longitudinal rear end 20b, 22b. In this example, the transversal sections of the lateral tubes are smaller than the longitudinal ends at the middle of the tubes. More specifically, the transversal sections of the tubes taper towards the longitudinal ends.

[0060] To allow their inflation, each lateral tube 20, 22 is equipped with an inflation valve 20c arranged in this example near the longitudinal rear end. In this example, the inflatable longitudinal tubes are fluidly independent of each other. This means that they can be inflated and deflated independently of each other.

[0061] The boat 10 further comprises an inflatable base 24 which extends according to the longitudinal direction of the lateral tubes and is arranged between said two lateral tubes 20, 22.

[0062] In this example, the inflatable base 24 and the inflatable lateral tubes 20, 22 are constituted by a layer of PVC covered by a textile layer. They could however be made of coated material, PU for example.

[0063] By way of FIGS. 2 and 3 the inflatable base 24 according to the present invention will now be described in more detail. FIG. 2 shows the inflatable base, in its deflated state. In this state, the inflatable base extends substantially plane and has a front portion 24a and a rear portion 24b. The

inflatable base **24** further comprises a floor portion, referenced **26**, which has a longitudinal front end **26a** and a longitudinal rear end **26b**.

[0064] It is understood that the floor portion **26** constitutes the floor of the boat **10**. Also, the lateral tubes **20**, **22** extend on either side of the lateral sides of the floor portion **26**. In this example, the lateral tubes **20**, **22** are connected pieces separate from the inflatable base **24**.

[0065] In keeping with the invention, the inflatable base **24** further comprises a first pair of end portions **30**, **32** which extend from the longitudinal front end **26a** of the floor portion.

[0066] As shown on FIG. 2, these two end portions **30**, **32** are symmetrical to each other relative to a plane P1 which extends according to the longitudinal direction L and is orthogonal to the floor portion **26**. The end portions **30**, **32** are preferably made of the same material as the floor portion **26**.

[0067] The end portions **30**, **32** are also connected to the floor portion according to fold lines **34**, **36** formed between the floor portion and each of the end portions.

[0068] As shown on FIG. 2, the fold lines **34**, **36** are inclined relative to the longitudinal direction of the boat. In this embodiment, they form substantially a “V” at the longitudinal end **26a** of the floor portion. The point of the “V” is directed in an opposite direction of the other longitudinal end **26b** of the floor portion. In other terms the point of the “V” is directed towards the front end **24a** of the inflatable base **24**.

[0069] In this example, the fold lines **34**, **36** are constituted by discontinuous welds, simultaneously inflating the end portions and the floor portion.

[0070] In reference to FIG. 2, it is also shown that of the end portions **30**, **32** has first edges referenced respectively **30a** and **32a**, the first edges of the two end portions of the first pair being arranged opposite each other.

[0071] In this example, the first edges **30a**, **32a** are convex.

[0072] Each of the end portions **30**, **32** comprises also a second edge **30b**, **32b**, also convex. Each first edge **30a**, **32a** extends between the point **26d** of the “V” formed by the fold lines **34**, **36**, and a first end of the second edge **30b**, **32b**, the second end of said second edge **30b**, **32b** corresponds to the front end of the corresponding lateral side **26c**, **26d**.

[0073] Without departing from the scope of the present invention, the first and second edges **30a**, **32a**, **30b**, **32b** can form a single curved line. In this case the first second edges are the edges which extend on either side of the front apex of said curved line.

[0074] As shown on FIG. 2, the inflatable base **24** further comprises a second pair of end portions **30'**, **32'** which extend from the longitudinal rear end **26b** of the floor portion **26**. The end portions **30'**, **32'** of the second pair are symmetrical to the end portions **30**, **32** of the first pair relative to a plane P2 perpendicular to the longitudinal direction L and perpendicular to the plane in which the floor portion extends.

[0075] It is therefore understood that the inflatable base **26** further comprises fold lines **34'**, **36'** which connect the floor portion to the end portions **30'**, **32'**.

[0076] The floor portion **26** further comprises a plurality continuous weld lines **26e** which are parallel to each other and which extend according to the longitudinal direction L. These continuous weld lines **26e** extend between the fold lines **34**, **36** of the end portions of the first pair and the fold lines **34'**, **36'** of the end portions of the second pair by being slightly retracted relative to the latter so as to make passages for air. It is therefore understood that in its inflated state the floor por-

tion comprises a plurality of parallel tubes **27** delimited from each other by the weld lines **26e**.

[0077] The end portions **30**, **32**, **30'**, **32'** further comprise discontinuous weld lines **30e**, **32e**, **30'e**, **32'e** parallel to each other and parallel to the associated fold line such that when the inflatable base is inflated the end portions have tubes delimited relative to each other by the discontinuous welds **30e**, **32e**, **30'e**, **32'e**.

[0078] FIG. 3 illustrates the inflatable base **24** in its inflated state. For its inflation, the inflatable base comprises an inflation valve **24c**, more clearly seen in FIG. 5, which is situated near the point of the “V” formed by the fold lines **34'**, **36'** of the end portions of the second pair. Also, the fold lines **34'**, **36'** are constituted by discontinuous welds, enabling rapid and simultaneous inflation of the floor portion and the end portions **30**, **32**.

[0079] It is understood that when the inflatable base **24** is in its inflated state, each end portion **30**, **32** of the first pair can be folded around the corresponding fold line **34**, **36** to form the first bow **16** of the boat.

[0080] Similarly, the end portions **30'**, **32'** of the second pair can be folded around the corresponding fold lines **34'**, **36'** to form the second bow **18** of the boat.

[0081] In reference to FIG. 3, it is also shown that the width of the inflatable base, in its inflated state, corresponds to the width I of the floor portion **26**.

[0082] FIG. 4 shows more particularly the first bow **16** formed by the folding of the end portions **30**, **32** according to the fold lines **34**, **36**. It is understood that the first edges **30a**, **32a** are brought together to constitute the end front edge of the bow **16**. In this example, the upper parts of the first edges **30**, **32** are fixed to each other, in this example, by welding, to improve the holding of the first bow **16**.

[0083] For assembling accessories, seats especially, the floor portion **26** is preferably engaged in a cover **40** illustrated in FIGS. 6a and 6b. As is clear from these figures, the cover **40** fits over the floor portion, the end portions of the first and second pairs extending out of the cover on either side of these longitudinal ends.

[0084] By way of FIGS. 7 and 8, an example of mounting the boat according to the invention will now be described.

[0085] First of all, the inflatable base and the lateral tubes are inflated by means of an inflator connected to the inflation valves. The end portions **30**, **32**, **30'**, **32'** are folded around their respective fold lines **34**, **36**, **34'**, **36'** to form the first and second bows **16**, **18**.

[0086] The inflatable base and the lateral tubes are then placed together so that the lateral tubes extend on either side of the lateral sides of the floor portion. The end portions forming the first and second bows **16**, **18** are then arranged so as to extend below the longitudinal ends **20a**, **22a**, **20b**, **22b** of the inflatable lateral tubes **20**, **22**. This arrangement is beneficial due to the fact that, as mentioned previously, the lateral tubes **20**, **22**, have a curved form, a sort of “banana” form. It is therefore understood that the first bow **16** is arranged under the longitudinal ends of the lateral tubes **20**, **22**.

[0087] FIG. 8, which represents the bow **16** viewed in transversal section, illustrates the fact that the tubes **20**, **22** rest on the end portions **30**, **32**. This FIG. 8 shows that the transversal section of the bow **16** has a hydrodynamic profile favouring sliding. This FIG. 8 also illustrates the waterline E.

[0088] In this example, the boat **10** comprises an external envelope **50** in which the lateral tubes **20**, **22** and the inflatable base are housed. To improve the holding of the inflatable base

24, the cover 40 is preferably fixed to the external envelope 50. In this example, the external envelope 50 extends over the entire length of the boat 10. Optionally, the inflatable base can be welded to the lateral tubes 20, 22 to further improve the robustness of the boat 10.

1. A boat having a longitudinal direction, and comprising: a first bow;
two inflatable lateral tubes extending according to the longitudinal direction of the boat;
an inflatable base arranged between the two inflatable lateral tubes;
wherein the inflatable base comprises a floor portion, and at least one first pair of end portions extending from one of the two longitudinal ends of the floor portion, wherein a fold line is formed between the floor portion and each of the end portions of the first pair, and wherein when the inflatable base is in its inflated state each end portion is in a position folded around the corresponding fold line to form the first bow of the boat.
2. The boat according to claim 1, wherein the fold lines extend by forming a "V" at one of the longitudinal ends of the floor portion, the point of the "V" being directed in a direction opposite the other longitudinal end of the floor portion.
3. The boat according to claim 1, wherein each of the end portions has a first edge, and wherein the first edges of the two end portions are fixed to each other, at least when the inflatable base is inflated.
4. The boat according to claim 1, wherein the inflatable lateral tubes have a curved form such that when the inflatable lateral tubes and the inflatable base are inflated, the end portions forming the bow extend below the longitudinal ends of the inflatable lateral tubes.
5. The boat according to claim 4, wherein, when the inflatable lateral tubes and the inflatable base are inflated the inflatable lateral tubes rest on the end portions.

6. The boat according to claim 1, wherein the end portions comprise discontinuous weld lines delimiting a plurality of tubes.

7. The boat according to claim 1, wherein said fold line is a discontinuous weld.

8. The boat according to claim 1, wherein the inflatable base comprises at least one inflation valve arranged at one of the longitudinal ends of the floor portion.

9. The boat according to claim 1, wherein it further comprises an external envelope in which the inflatable lateral tubes and the inflatable base are housed.

10. The boat according to claim 9, wherein the external envelope extends over all or part of the length of the boat.

11. The boat according to claim 10, wherein the floor portion is engaged in a cover designed to be fixed to the external envelope.

12. The boat according to claim 1, wherein the inflatable base and/or the inflatable lateral tubes are constituted by a layer of PVC covered by a textile layer.

13. The boat according to claim 1, wherein the inflatable base and/or the inflatable lateral tubes are made of coated material.

14. The boat according to claim 1, wherein the inflatable base is welded to the inflatable lateral tubes.

15. The boat according to claim 1, the inflatable base further comprises a second pair of end portions extending from the other longitudinal end of the floor portion, and wherein the end portions of the second pair are arranged so as to be folded relative to the floor portion to form a second bow of the boat, opposite the first bow, when the inflatable lateral tubes and the inflatable base are in their inflated state.

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