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(54) **VESSEL WITH MAST HAVING SIDE PARTS SITUATED ON EACH SIDE OF THE VESSEL**

(57) The invention relates to shipbuilding, specifically to masts of floating transport means and may be used to create new and modernize existing ships with the installation of a new type of masts using four-sided or fore-and-aft sails on raising or stationary masts located on the sides of a ship.

The ship with the mast having lateral parts located on the sides of the ship includes at least one mast having a right lateral part of the mast and a left lateral part of the mast. The right lateral part of the mast and the left lateral part of the mast are installed on the right and left lateral parts of the ship, respectively, and are configured to install a sail or sails thereon and/or therebetween.

The technical result is providing for installing the sails both in the space between the right and left lateral parts of the mast and thereon, optimizing the height of the mast with a reduction in the mast weight and cost and the structure as a whole with the provided mast design, simplifying the design and manufacture, increasing reliability, providing for ease of operation and maintenance, providing for modernization of existing ships with fitting them out with the provided universal mast design, which generally provides for improving the functionality, maneuverability of the ship, energy saving when operated, reducing fuel consumption, and expanding the scope of use, including for transport ships.

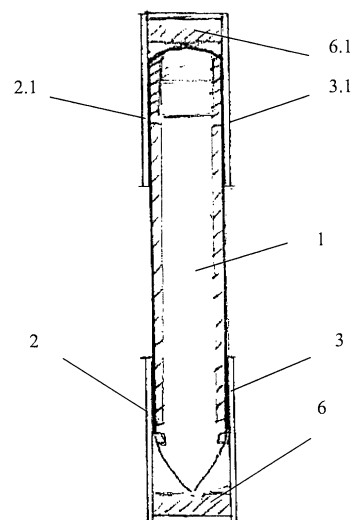


Fig. 1

EP 4 420 971 A1

Description

[0001] The invention relates to shipbuilding, specifically to masts of floating transport means and may be used to create new ships and modernize existing ones by installing a new type of masts using four-sided or fore-and-aft sails on raising or stationary masts located on the sides of the ship.

[0002] As of this date, ships with masts installed in the central part of the deck are known (<https://www.alamy.com/stock-photo/ship-mast.html>, <https://hsp.com.ua/ru/proekty-sudov>, <https://www.ship-modeling.ru/content/books/archive/NavalModeling-DOSAAB/Part2/index.htm>, <https://www.quora.com/How-was-the-mast-of-a-ship-physically-attached-in-the-age-of-sailing-How-would-the-sailors-repair-or-replace-a-broken-mast>). At the same time, the disadvantages of such designs include the complexity or impossibility of access to the holds for loading and unloading cargoes, the lack of free space on the deck. Also, if the masts are not adapted for lowering and raising, it is not possible for the ship to pass under some bridges, and maintenance and repair become more complicated, which reduces the operational properties of the ship and limits its scope of use. Sailing rigging on stationary masts prevents the use of the usable deck area and does not allow cargo handling mechanisms to have access to the holds from above. Folding masts located in the center plane of the ship (above the keel) also block access to the deck and hold hatches.

[0003] From the prior art, a sailing ship selected as the closest prior art is known, having pylons built into the sheathing at individual fastening points, wherein the individual fastening points are located in close proximity to the sides of a hull, and the space limited between a deck-bridge and a cover (the description for patent ES2259567 (B1) published on 11/01/2006). Said sailing ship includes a deck-covered hull and at least one mast built into said deck, including said mast, in the longitudinal plane of said hull, a spar, on which a leech of the sail is raised or sheathed. The lower part of said mast located above said deck is configured in the form of a bridge, which has a support head for said pylon and two pylons that extend symmetrically from each other and from said longitudinal plane and are embedded in said deck at two fastening points located near the board sides of said hull such that said mast is intersected with said deck not in said longitudinal plane, but between said deck-bridge and said deck, the free space not occupied by said mast is defined.

[0004] In the closest prior art, the problem of eliminating the restriction of the captain's view in the direction of the bow as well as the difficulty of the crew's movement on the deck is solved.

[0005] At the same time, the closest prior art has a number of disadvantages.

[0006] The disadvantages of the closest prior art include the cumbersomeness and complexity of the mast design, an increase in its height with the presence of the

supporting part of the mast and the location of the working part of the mast, namely the spar, above the supporting part, cluttering the space above the deck with the exception of the possibility of free and not complicated loading and unloading of products, materials or goods from the ship holds, the complexity of operation and maintenance, the exclusion of using the structure when it is necessary to pass under bridges, the exclusion of the possibility of modernization of many existing ships with fitting out them with sails to save fuel when sails can be used, which in turn limits the scope and functionality of the closest prior art.

[0007] At the same time, the well-known prior art, having a complex structure, includes many components, has an increased weight, an increased height, which results in unnecessary energy consumption and reduces the maneuverability of the ship. Known design features, manufacturing complexity determine its low reliability and high cost.

[0008] The invention is based on the task of developing a ship with a mast having side parts with a simplified design, improved performance properties, increased reliability, maneuverability and energy saving, providing for the expansion of functionality, and scope of use.

[0009] The set task is achieved in that in the ship with the mast having lateral parts located on the sides of the ship, including the ship and at least one mast having the right lateral part of the mast and the left lateral part of the mast, as provided herein, the right lateral part of the mast and the left lateral part of the mast are installed on the right and left lateral parts of the ship, respectively, and are configured to install a sail or sails thereon and/or in the space therebetween.

[0010] At the same time, as provided herein, the sail or sails are installed to be winded up on a barrel installed between the right lateral part of the mast and the left lateral part of the mast or on each thereof.

[0011] At the same time, as provided herein, the right and left lateral parts of the mast are installed to be raised and lowered parallel to the longitudinal axis of the ship.

[0012] At the same time, as provided herein, the right and left lateral parts of the mast are installed to be raised and lowered in the vertical plane along the ship.

[0013] At the same time, as provided herein, the right and left lateral parts of the mast are installed to be located at least partially outside the deck of the ship.

[0014] At the same time, as provided herein, the right and left lateral parts of the mast are installed to be lowered and raised and to be located at least partially outside the deck of the ship in their lowered position.

[0015] At the same time, as provided herein, the right and left lateral parts of the mast are installed for their at least outer lateral parts to be located outside the deck of the ship.

[0016] At the same time, as provided herein, the right and left lateral parts of the mast are installed, respectively, on the right and left lateral board sides of the ship outside the board sides.

[0017] At the same time, as provided herein, the right and left lateral parts of the mast are fixed on the deck in close proximity to or on the board sides of the ship.

[0018] In addition, as provided herein, the right and left lateral parts of the mast are configured straight.

[0019] In addition, as provided herein, the right lateral part of the mast and the left lateral part of the mast are installed to be located in parallel.

[0020] At the same time, as provided herein, the right and left lateral parts of the mast are installed symmetrically in relation to each other and the longitudinal central axis of the ship.

[0021] At the same time, as provided herein, the right and left lateral parts of the mast are connected at the end parts, and at least an upper and lower yards with a four-sided sail or sails are located in the space therebetween.

[0022] At the same time, as provided herein, the right and left lateral parts of the mast are connected at the end parts by a connecting module.

[0023] At the same time, as provided herein, the right and left lateral parts of the mast at the end parts are connected by the connecting module in the form of a cross bulkhead or a movable carriage.

[0024] In addition, as provided herein, the right and left lateral parts of the mast are connected by the connecting module in the form of an upper carriage, under which between the right and left lateral parts of the mast, the upper yard with a sail, connected to the upper carriage, and the lower yard connected to the lower carriage, connected to the rotating barrel with a sail fixed on it by its lower end part, are installed.

[0025] At the same time, as provided herein, four-sided and/or fore-and-aft sails are installed on the right and left lateral parts of the mast.

[0026] At the same time, as provided herein, the four-sided and/or fore-and-aft sails are installed on the right and left lateral parts of the mast for winding up thereon or folding or lowering them.

[0027] The listed features of the provided technical solution are essential features of the invention claimed, and the set thereof allows to obtain the expected technical result, i.e., providing for installing the sails both in the space between the right and left lateral parts of the mast and thereon, optimizing the height of the mast with a reduction in the mast weight and cost and the structure as a whole with the provided mast design, simplifying the design and manufacture, increasing reliability, providing for ease of operation and maintenance, providing for modernization of existing ships with fitting them out with the provided universal mast design, which generally provides for improving the functionality, maneuverability of the ship, energy saving when operated, reducing fuel consumption, and expanding the scope of use, including for transport ships.

[0028] The causal relationship of essential features of the provided solution with the technical result that is achieved is as follows.

[0029] Due to the fact that in the claimed ship with the

mast having lateral parts located on the sides of the ship, in the set of features, the right lateral part of the mast and the left lateral part of the mast are installed on the right and left sides of the ship, respectively, and are configured to install a sail or sails thereon and/or in space therebetween, thus eliminating the need to make a single part of the mast above them to install the sail or sails thereon, which makes it possible to simplify the design and optimize the height and weight of the mast with their reduction, provide for installation of the sails within the height of the right and left sides of the mast or with a slight excess if necessary, both thereon and therebetween in an embodiment, which, along with a decrease in the mast height, also increases the maneuverability of the ship, increases the embodiments and the scope of use. At the same time, with the decrease in the mast height and the simplification of the design, the weight is also reduced, the reliability and maneuverability of the ship with the mast of the claimed design is increased.

[0030] This also frees up space not only on the deck but also above it, which makes it possible to use the claimed technical solution for cargo ships as well, freely load cargo into the hold or holds as well as unload them without restriction.

[0031] In this case, it is possible to expand the embodiments of the mast both with locating the sails between the right and left lateral parts of the mast and on structural elements installed on the lateral parts of the mast. These embodiments may be used in combination with an embodiment including the installed right and left lateral parts of the mast with the possibility to raise/lower them, which provides for greater maneuverability, versatility, expended functionality, and the scope of use.

[0032] In an embodiment, when the right and left lateral parts of the mast are installed to be located at least partially outside the deck of the ship, there is a possibility to locate the mast both along the length and on the sides outside the ship, which provides for free access to the deck of the ship for loading holds and unloading from them, as well as free movement on the deck, which expands the functionality and scope of use of the solution claimed.

[0033] In an embodiment, when the right and left lateral parts of the mast are installed to be lowered and raised and to be located at least partially outside the deck of the ship in their lowered position, in addition to the above, there is a possibility to pass under the bridges and have easy access to the mast for maintenance and repair.

[0034] In an embodiment, when the right and left lateral parts of the mast are installed, respectively, on the right and left lateral parts of the ship outside the board sides, full freeing up of the space above the deck is provided, the need to mount the right and left sides of the mast on the deck or in/under it is eliminated, the scope of use of the claimed technical solutions for a variety of ships, including the modernization of existing ships to provide them with sails, is expanded.

[0035] In an embodiment, when the right and left lateral

parts of the mast are configured straight, the design is simplified, and it is possible to install the sails thereon.

[0036] When installing the right and left lateral parts of the mast symmetrically relative to each other and the longitudinal central axis of the ship, the displacement of the gravity center of the ship is excluded.

[0037] In an embodiment, when the right and left lateral parts of the mast are connected at the end parts, and at least the upper and lower yards with a sail or sails are located in the space therebetween, the need for installing the spar above the right and left lateral parts of the mast to install the sail or sails is excluded.

[0038] In an embodiment, when between the right and left lateral parts of the mast with fixing thereto, the upper and lower carriages are installed to move along them with a sail fixed thereto, located on the barrel located between the upper and lower carriages and configured rotating, the winding up of the sail on the barrel and freeing up the space between the right and left lateral parts of the mast, as well as the use of the ship without the sail in appropriate weather conditions or if necessary, are provided.

[0039] When installing four-sided and/or fore-and-aft sails on the right and left lateral parts of the mast, in an embodiment, with a possibility of winding up thereon or folding, or lowering them, there is provided the optimization of the height of the mast with a reduction in weight and cost of the mast and the design as a whole, simplifying the design and manufacture, increase in reliability, ease of operation and maintenance, freeing up the space above the deck, the possibility of modernization of existing ships with the provided universal mast design, which in general provides for an increase in the functionality, maneuverability of the ship, energy saving during operation, reduced fuel consumption, and expansion of the scope of use, including transport ships.

[0040] So, the provided design is universal, has a low manufacturing cost and is easy to operate and maintain. In various modifications, it may be used for operation in various conditions and on many ships, including existing ones.

[0041] The following essence of the invention is explained in the description below as a non-limiting embodiment with reference to the drawings, in which:

Fig. 1 is a top view of the ship with the masts folded, equipped with four-sided sails, with a shaded rigging placing area.

Fig. 2 is a top view of the ship with masts folded, equipped with fore-and-aft sails, with a shaded rigging placing area.

Fig. 3 is a side view of the ship with masts folded.

Fig. 4 is a side view of the ship with the service masts used with pulleys at the top for raising the main masts using winches.

Fig. 5 is a side view of the ship with masts raised, fixed with tension braces.

Fig. 6 is a side view of the ship with masts raised,

with four-sided sails.

Fig. 7 is a side view of the ship with masts raised, with fore-and-aft sails.

Fig. 8 is a side view of the ship with masts raised, with fore-and-aft sails.

Fig. 9 is a side view of a rigging of a ship with a four-sided sail.

Fig. 10 is a top view of the rigging of the ship with the four-sided sail.

Fig. 11 is a front view of the rigging of the ship with the four-sided sail.

Fig. 12 is a front view of the rigging of the ship with the four-sided sail.

Fig. 13 is a top view of the ship with masts folded, equipped with fore-and-aft sails.

Fig. 14 is a side view of the ship with masts folded, equipped with fore-and-aft sails.

Fig. 15 is a side view of the ship with masts partially raised, equipped with fore-and-aft sails.

Fig. 16 is a top view of the ship with masts partially raised, equipped with fore-and-aft sails.

Fig. 17 is a front view of the ship with masts partially raised, equipped with fore-and-aft sails.

[0042] The provided ship with a mast with side parts located on the sides of the ship, in an embodiment that is not the only possible one and does not exclude other possible embodiments, includes a ship 1 with a mast that has a right lateral part of the mast 2 and a left lateral part of the mast 3, which are installed on the right and left lateral parts of the ship, respectively, and are configured to install a fore-and-aft and/or four-sided sail or sails thereon and/or in the space therebetween.

[0043] The ship 1 may be configured as a sailing yacht, a ship, a cargo, or a passenger floating transport means, or other embodiments.

[0044] The right lateral part of the mast 2 and the left lateral part of the mast 3 are working sides of the mast, on which or between which fore-and-aft or four-sided sails may be installed.

[0045] The claimed mast may be configured with telescopic right and left lateral parts of the mast.

[0046] In the preferred embodiment, the right 2 and left 3 lateral parts of the mast are installed to be lowered and raised to be installed in the working position. lowering and raising of the right 2 and left 3 lateral parts of the mast are carried out using winches in the embodiment, with installation on tension braces in the working position. The right 2 and left 3 lateral parts of the mast are installed to be raised and lowered parallel to the longitudinal central axis of the ship.

[0047] In an embodiment, the possibility of installation in the space between the right lateral part of the mast 2 and the left lateral part of the mast 3 of the sail or sails is provided by connecting said right 2 and left 3 lateral parts of the mast with a connecting module in the form of an upper carriage 4, under which between the right and left lateral parts of the mast, an upper yard 5 with a

sail 6, connected to the upper carriage 4, and a lower yard 9 connected to a lower carriage 8, connected to a rotating barrel 10 with the sail 6 fixed on it by its lower end part, are installed, which ensures that the sail 6 is installed in the working position and rolling it onto the barrel when it is not in use. In an embodiment, the lower yard 9 is connected to cables 7 of winches 13 to control the sail 6. At the same time, the barrel 10 is connected to stopping devices 11 to fix the sail 6 in the desired position.

[0048] The ship may include the second mast with the right 2.1 and left 3.1 lateral parts of the mast, between which a sail 6.1 is installed.

[0049] The sails are controlled by means of the cables 7, 12 of the winches 13, 14 connected to the yards 5, 9 in an embodiment.

[0050] In another embodiment, which also does not limit all possible applications, the fore-and-aft sails 15 are installed on the right 2 and left 3 lateral parts of the mast to be wound up on the right 2 and left 3 lateral parts of the mast, respectively, or folded and/or lowered. The winding up of the sails 15 may be carried out in the embodiments by rotating the sails around the respective right 2 and left 3 lateral parts of the mast manually or using mechanisms or devices. In this case, the right 2 and left 3 lateral parts of the mast are connected by a connecting module in the form of a longitudinal bulkhead 16, which may also be used in the above embodiment. In one of possible embodiments, on the right 2 and left 3 lateral parts of the mast, rotating barrels 17 are installed with the fore-and-aft sails 15 wound thereon in an embodiment. Sheet winches 19 are connected by sheets via sheet carriages 18 with the sails 15 on the rotating barrels 17.

[0051] On the ship 1, in an embodiment, two masts having the right 2, 2.1, and left 3, 3.1 lateral parts of the mast, respectively, and the fore-and-aft sails 15, 15.1, respectively, may be installed.

[0052] At the same time, the masts in an embodiment may be installed outside the board sides of the ship 1, configured raising and such that the right 2 and left 3 lateral parts of the mast when lowered and in the working position being completely outside the ship.

[0053] In other embodiments, the right 2 and left 3 lateral parts of the mast may be installed on the deck in close proximity to the board sides of the ship 1 or on its board sides, such that in the horizontal (lowered) position, at least the upper sides of the right 2 and left 3 lateral parts of the mast are located outside the ship 1.

[0054] The right 2 and left 3 lateral parts of the mast are configured straight, installed to be located in parallel.

[0055] The right 2 and left 3 lateral parts of the mast are installed symmetrically relative to each other and the longitudinal central axis of the ship 1.

[0056] The entire rigging of the masts in the folded state is located along the board sides, without cluttering up the central part of the deck. Part of the rigging may be located outside the stern or the bow of the ship 1. In order to raise

the right 2 and left 3 lateral parts of the mast, winches, hydraulic lifts, and other devices may be used. After raising the mast, the tension cables are fixed with stopping devices. To provide for the rigidity of the structure, it is possible to use diagonal tension braces, provided that they do not interfere with the operation of the sails and, when the masts are lowered, they will be located in the areas specified in Fig. 1 and Fig. 2.

[0057] The claimed ship with the mast having lateral parts located on the sides of the ship is used as follows.

[0058] In an embodiment, on a newly created ship or as a result of modernization on a previously existing ship, at least one mast is installed, configured with the right 2 and left 3 lateral parts of the mast, between which the four-sided sails 6 are installed.

[0059] In the process of using said ship, when raising the four-sided sails 6, the following actions are performed:

- 1) A mast or masts are raised and the tension braces are fixed. When raising with the winch, a technological short mast with a pulley, which is removed after raising, may be used.
- 2) The upper 4 and lower 8 carriages are synchronously lowered down. It is possible to use a synchronization mechanism similar to that used on car service station lifts.
- 3) A single angle of the carriages 4, 8 is set in relation to the wind.
- 4) Tension braces of the lower fastening of the sail 6 and the lower yard 9 are fixed.
- 5) The upper carriage 4 is slowly raised. The stability of the angle to the wind of the upper fastening of the sail and the upper yard 5, and the tension of the sail 6 on the barrel 10 are controlled.
- 6) At the required height, the upper carriage 4 is stopped and fixed.
- 7) The sail twist is set.
- 8) Stretching the upper fastening of the sail 6 is fixed.

[0060] The sail 6 is ready for operation.

[0061] When lowering the four-sided sails 6, the following actions are performed:

- 1) The fixation of the upper yard 5 is removed.
- 2) The sail 6 is lowered. When lowering, the stability of the angle to the wind of the upper sail fastening (the upper yard 5) and the tension of the sail 6 on the barrel 10 are controlled.
- 3) Both yards 5, 9 are set perpendicular to the longitudinal axis of the ship.
- 4) The fixation of carriages 4, 8 is removed.
- 5) Both carriages 4, 8 synchronously raised to the upper point.
- 6) The fixation of the tension braces of the right 2 and left 3 lateral parts of the mast is removed.
- 9) The right 2 and left 3 lateral parts of the mast are slowly lowered to their stops. When lowering with

the winch, the technological short mast with the pulley may be used.

7) During lowering, the weakening tension braces are wound up onto the barrels.

8) The mast is fixed in the lowered position.

[0062] In an embodiment, when the fore-and-aft sails 15 are installed on the right 2 and left 3 lateral parts, in the process of using the claimed ship with the mast having lateral parts located on the sides of the ship, the following actions are performed.

[0063] When raising the fore-and-aft sails 15:

1) The right 2 and left 3 lateral parts of the mast are raised to the desired angle and the braces are fixed. When raising with the winch, it is possible to use the technological short mast 20 with the pulley.

2) The fixation of the barrel 17 of the sail 15 located on one of the lateral parts of the masts 2 or 3 is removed.

3) The cable (sheet) from the sail 15 is manually threaded through the carriage block 18 of the cable (sheet) on the opposite side of the ship and attached to the winch 19. It is also possible to mechanize this process.

4) The sheet carriage is set to the desired position to provide for the desired angle of the sail to the wind.

5) Using the winch, the sail 15 is pulled from the barrel 17 to the desired size. In this process, the tension of the sail 15 is controlled.

6) The barrel 17 of the sail is fixed as for rotation.

7) The sail 15 is adjusted by analogy with the stay sail on classic sailing yachts.

8) The sheet is fixed. The sail 15 is ready for operation.

[0064] When lowering the fore-and-aft sails 15:

1) The sheet fixation is removed.

2) The sail 15 is rolled onto the barrel 17. When rolling, the tension of the sail 15 on the barrel 17 is controlled.

3) The barrel 17 with the sail 15 is fixed as for rotation.

4) The fixation of the tension braces of the right 2 and left 3 lateral parts of the mast is removed.

5) The right 2 and left 3 lateral parts of the mast are slowly lowered to their stops. When lowering with the winch, the technological short mast 20 with the pulley may be used.

6) During lowering of the right 2 and left 3 lateral parts of the mast, weakening tension braces are wound up onto the barrels.

7) The mast is fixed, namely the right 2 and left 3 lateral parts of the mast, in the lowered position.

[0065] In changing tack when using the fore-and-aft sails 15:

1) The sail 15, on one side, for example, on one of the lateral parts of the mast, the right 2 lateral part, is rolled.

2) The ship's course is changed.

3) The sail 15, on the other side, on the left 3 lateral part of the mast, is unrolled.

[0066] When raising and lowering the four-sided or fore-and-aft sails in case of strong wind, for reducing the load on the mechanisms, the sail may be oriented to the wind such that the wind load thereon is minimal.

[0067] The claimed technical solution provides for the use of raising masts on the sides of the ship to accommodate sailing rigging from the four-sided or fore-and-aft sails, including on large-capacity ships.

[0068] Using the claimed technical solution provides for a reduction in fuel consumption by ships, a decrease in harmful emissions into the atmosphere, the ability to gain access from above to the central part of the deck, the ability, in case of cargo ships, of accessing by cargo handling mechanisms to the holds from above, the ability to reconstruct operated ships to reduce fuel consumption and the environment pollution level.

[0069] Thus, the scope of application of the claimed technical solution is ensured both on newly created ships and on existing ships that also have mechanical vehicles (engines), with the expansion of a number of types of floating vehicles for various purposes, including ships, which provides for:

- reducing operating costs due to saving fuel and resources of internal combustion engines of ships,
- reducing harmful emissions into the atmosphere,
- more abilities for useful use of the central part of the deck,
- ability, in case of cargo ships, of accessing by cargo handling mechanisms to the holds from above,
- ability to safely maintain and repair rigging on the lowered masts,
- ability to reconstruct already operated ships to reduce fuel consumption and the environment pollution level,
- ability to create new types of ships (e.g., a sailing ship with a platform for flight machinery),
- ability to pass under bridges with the masts folded,
- ability to adjust the sails to the wind, as on classic sailing yachts, including reefing and sail twist,
- ability of easy mechanization and automation of the sail control process.

[0070] At the same time, an advantage of the claimed ship with the mast having lateral parts located on the sides of the ship is also providing for small dimensions and weight, maneuverability, and reliability.

[0071] A comparative analysis of said technical solution with the closest prior art demonstrated that the implementation of the set of essential features characterizing the provided invention results in the occurrence of

qualitatively new technical properties specified above.

[0072] Since the set of these properties has not been previously established from the existing prior art, it can be concluded that the provided technical solution meets the criterion of "inventive step."

[0073] At the same time, in the known sources of patent and other scientific and technical information, a ship with a mast having lateral parts located on the sides of the ship, with the set of essential features specified in the provision, was not found, therefore, the provided technical solution is considered to meet the criterion of "novelty."

[0074] In addition, according to the results of the verification in practice, the provided ship with the mast having lateral parts located on the sides of the ship is suitable for industrial use, since it does not include any structural elements, materials or technological operations that could not be reproduced at the present stage of development of science and technology, and therefore this technical solution is considered to meet the criterion of "industrial applicability."

Claims

1. A ship with a mast having lateral parts located on sides of the ship, comprising the ship and at least one mast having a right lateral part of the mast and a left lateral part of the mast, **characterized in that** the right lateral part of the mast and the left lateral part of the mast are installed on the right and left lateral parts of the ship, respectively, and configured to install a sail or sails thereon and/or therebetween.
2. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the sail or the sails are installed to be winded on the barrel installed between the right lateral part of the mast and the left lateral part of the mast or on each thereof.
3. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed to be raised and lowered.
4. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed to be raised and lowered in a vertical plane along the ship.
5. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed to be located at least partially outside a deck of the ship.
6. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right

and the left lateral parts of the mast are installed to be lowered and raised, and to be located at least partially outside the deck of the ship in their lowered position.

7. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed for at least their outer lateral parts to be installed outside the deck of the ship.
8. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed, respectively, on the right and the left board sides of the ship outside the board sides.
9. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are fixed on the deck in close proximity to or on the board sides of the ship.
10. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are configured straight.
11. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right lateral part of the mast and the left lateral part of the mast are installed to be located in parallel.
12. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed symmetrically in relation to each other and the longitudinal central axis of the ship.
13. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are connected at end parts, and at least the upper and the lower yards with the four-sided sail are located in a space therebetween.
14. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are connected at the end parts by a connecting module.
15. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are connected at the end parts by the connecting module in the form of a bulkhead or a carriage.
16. The ship with the mast having the lateral parts ac-

cording to claim 1, **characterized in that** the right and the left lateral parts of the mast are connected by the connecting module in the form of an upper carriage, under which between the right and the left lateral parts of the mast, the upper yard with a sail, connected to the upper carriage, and the lower yard connected to the lower carriage, connected to the rotating barrel with a sail fixed on it by its lower end part, are installed.

17. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the four-sided and/or the fore-and-aft sails are installed on the right and the left lateral parts of the mast.
18. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the four-sided and/or the fore-and-aft sails are installed on the right and the left lateral parts of the mast for winding up thereon or folding or lowering thereof.

Amended claims under Art. 19.1 PCT

1. A ship with a mast having lateral parts located on sides of the ship, comprising at least one mast having a right lateral part of the mast and a left lateral part of the mast, **characterized in that** the right lateral part of the mast and the left lateral part of the mast are installed on the right and left lateral parts of the ship, respectively, configured to be raised and lowered, and configured to install a sail or sails thereon and/or therebetween, the right and left lateral parts of the mast connected by a connecting module in the form of an upper carriage, under which between the right and left lateral parts of the mast, an upper yard with a sail, connected to the upper carriage, and a lower yard connected to a lower carriage, connected to a rotating barrel with the sail fixed on it by its lower end part, are installed, and/or on the right and left lateral parts of the mast, four-sided and/or fore-and-aft sails are installed to be winded on the rotating barrel installed on each thereof, or folded, or lowered.
2. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the sail or the sails are installed to be winded on the barrel installed between the right lateral part of the mast and the left lateral part of the mast or on each thereof.
3. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the four-sided and/or the fore-and-aft sails are installed on the right and the left lateral parts of the mast to be winded on the rotating barrel installed on each thereof, sheet winches are connected by sheets through sheet carriages with the sails on the rotating barrels.

4. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed to be raised and lowered in a vertical plane along the ship.
5. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed to be located at least partially outside a deck of the ship.
6. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed to be lowered and raised, and to be located at least partially outside the deck of the ship in their lowered position.
7. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed for at least their outer lateral parts to be installed outside the deck of the ship.

8. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed, respectively, on the right and the left lateral parts of the ship outside board sides.
9. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are fixed on the deck in close proximity to or on the board sides of the ship.
10. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are configured straight.
11. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right lateral part of the mast and the left lateral part of the mast are installed to be located in parallel.
12. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are installed symmetrically in relation to each other and the longitudinal central axis of the ship.
13. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are connected at end parts, and at least the upper and the lower yards with the four-sided sail are located in a space therebetween.

14. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are connected at the end parts by a connecting module.

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15. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the right and the left lateral parts of the mast are connected at the end parts by the connecting module in the form of a bulkhead or a carriage.

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16. The ship with the mast having the lateral parts according to claim 1, **characterized in that** the four-sided and/or the fore-and-aft sails are installed on the right and the left lateral parts of the mast.

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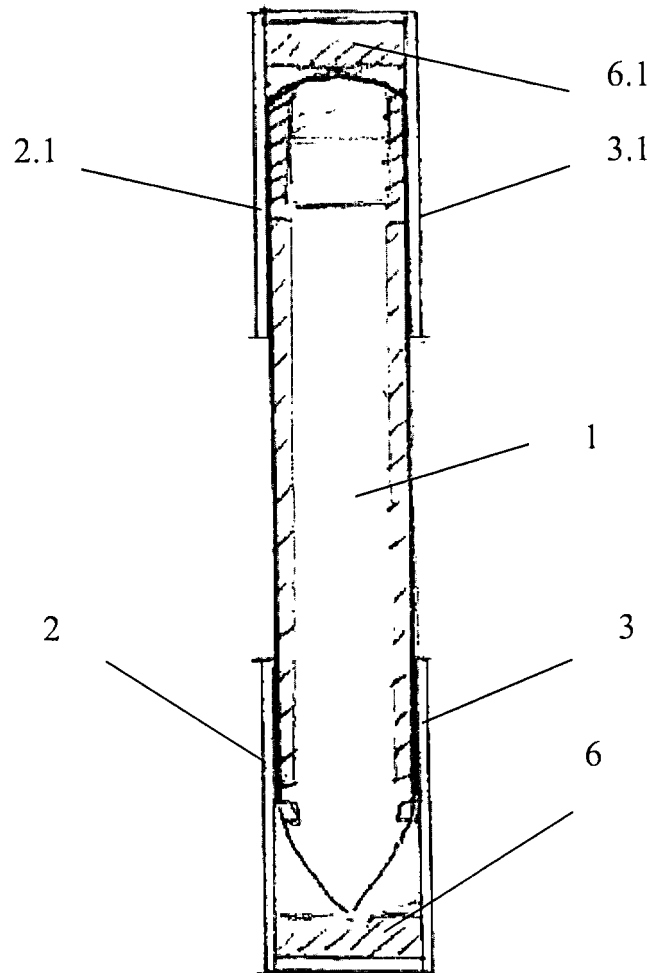


Fig. 1

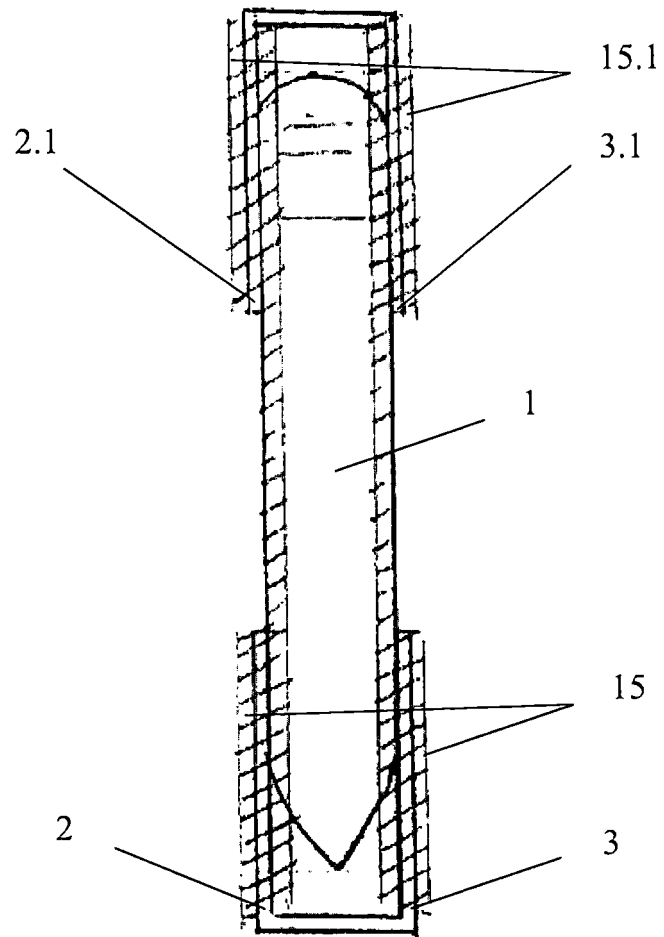


Fig. 2

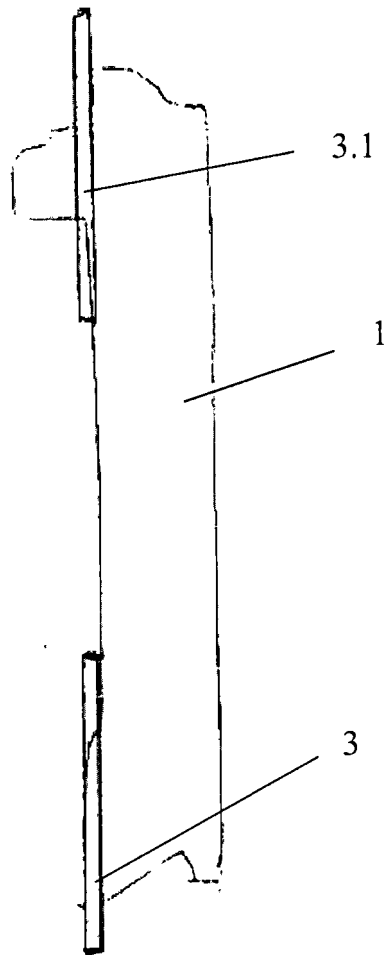


Fig. 3

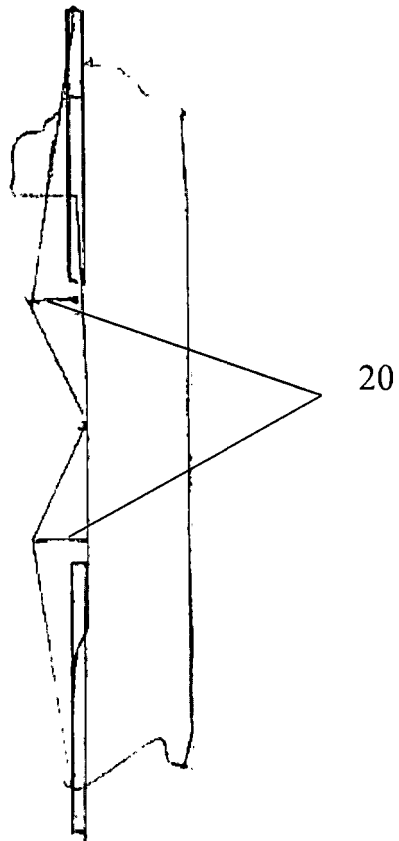


Fig 4

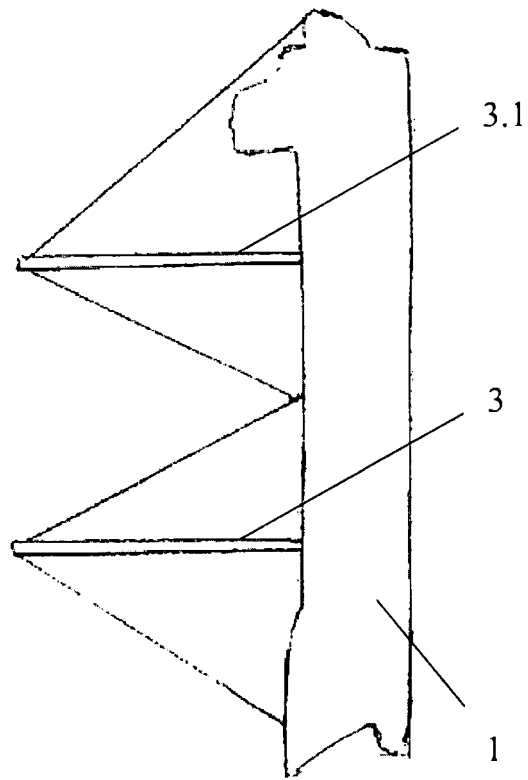


Fig. 5

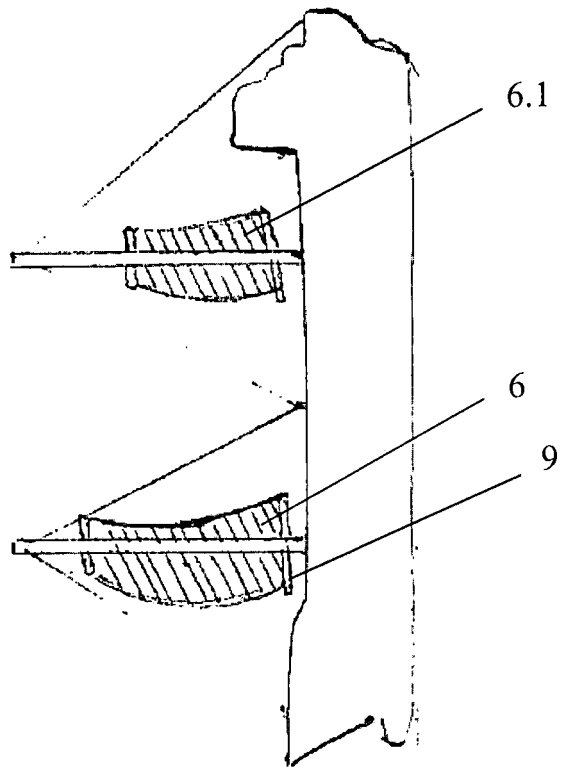


Fig. 6

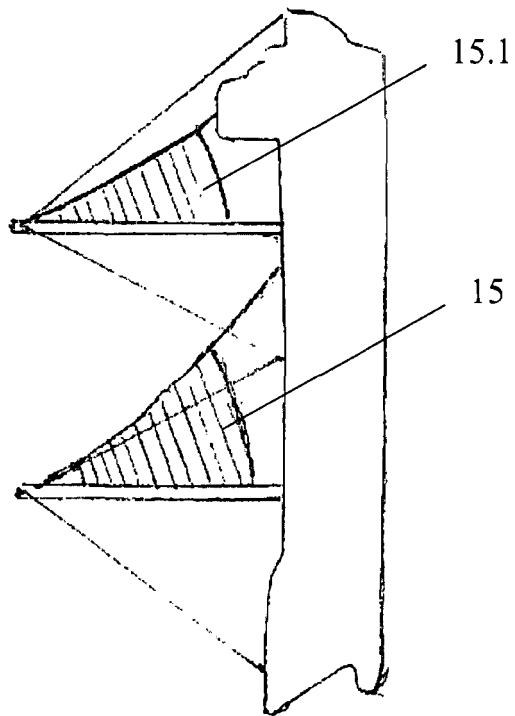


Fig. 7

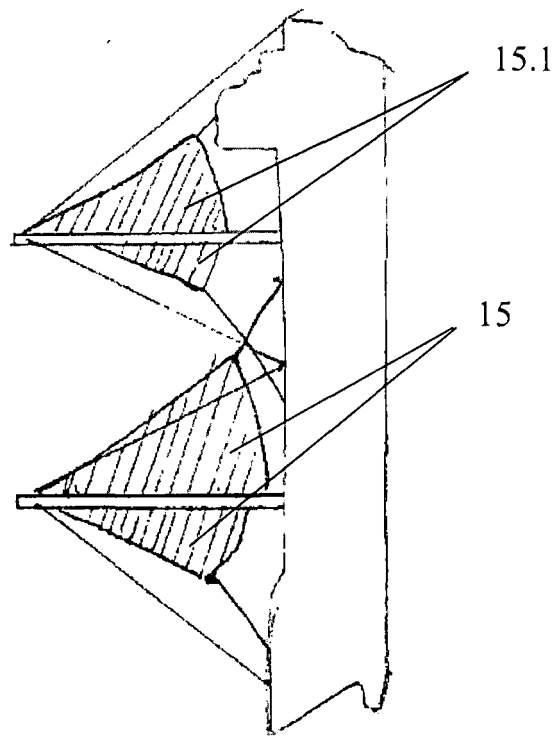


Fig. 8

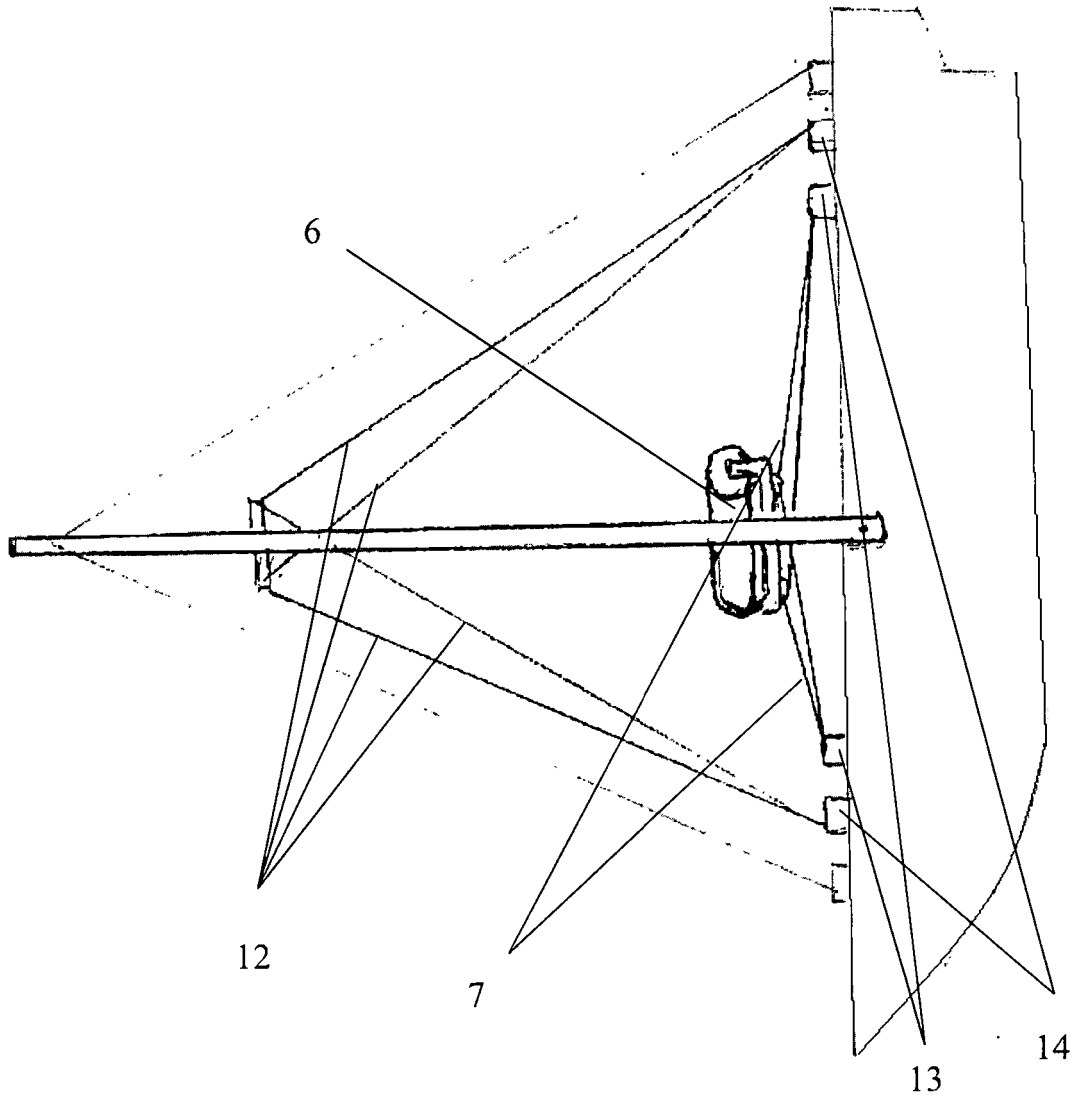


Fig. 9

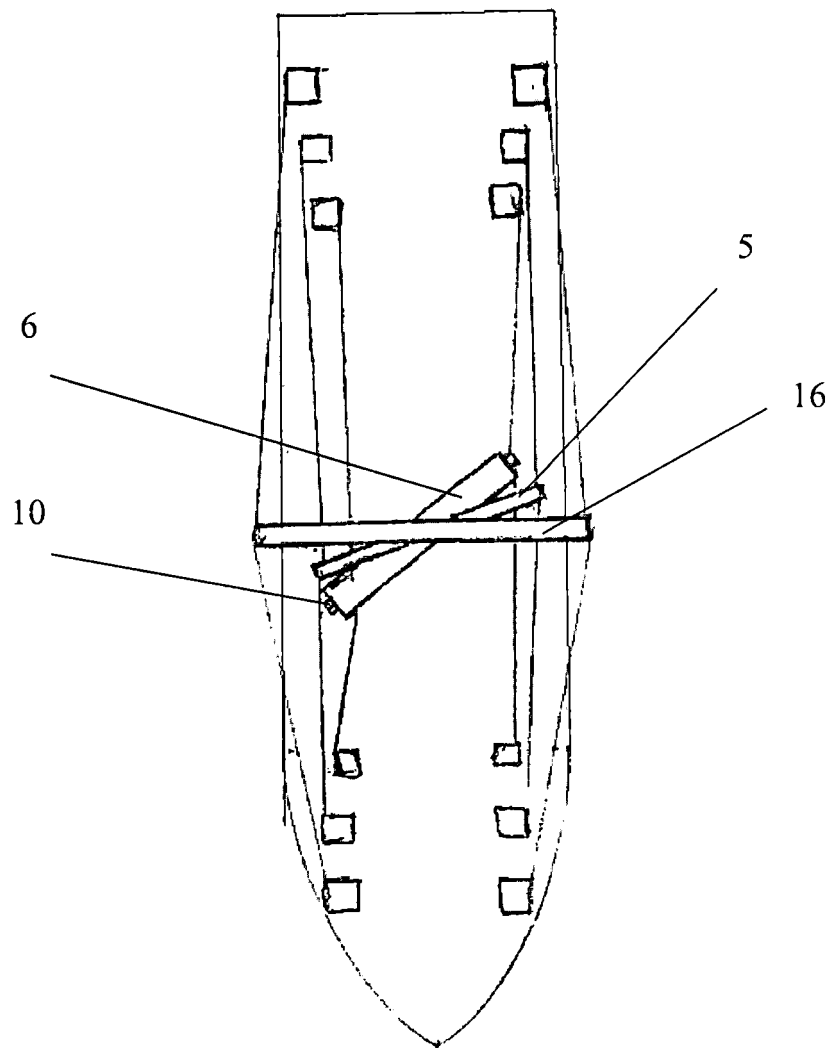


Fig. 10

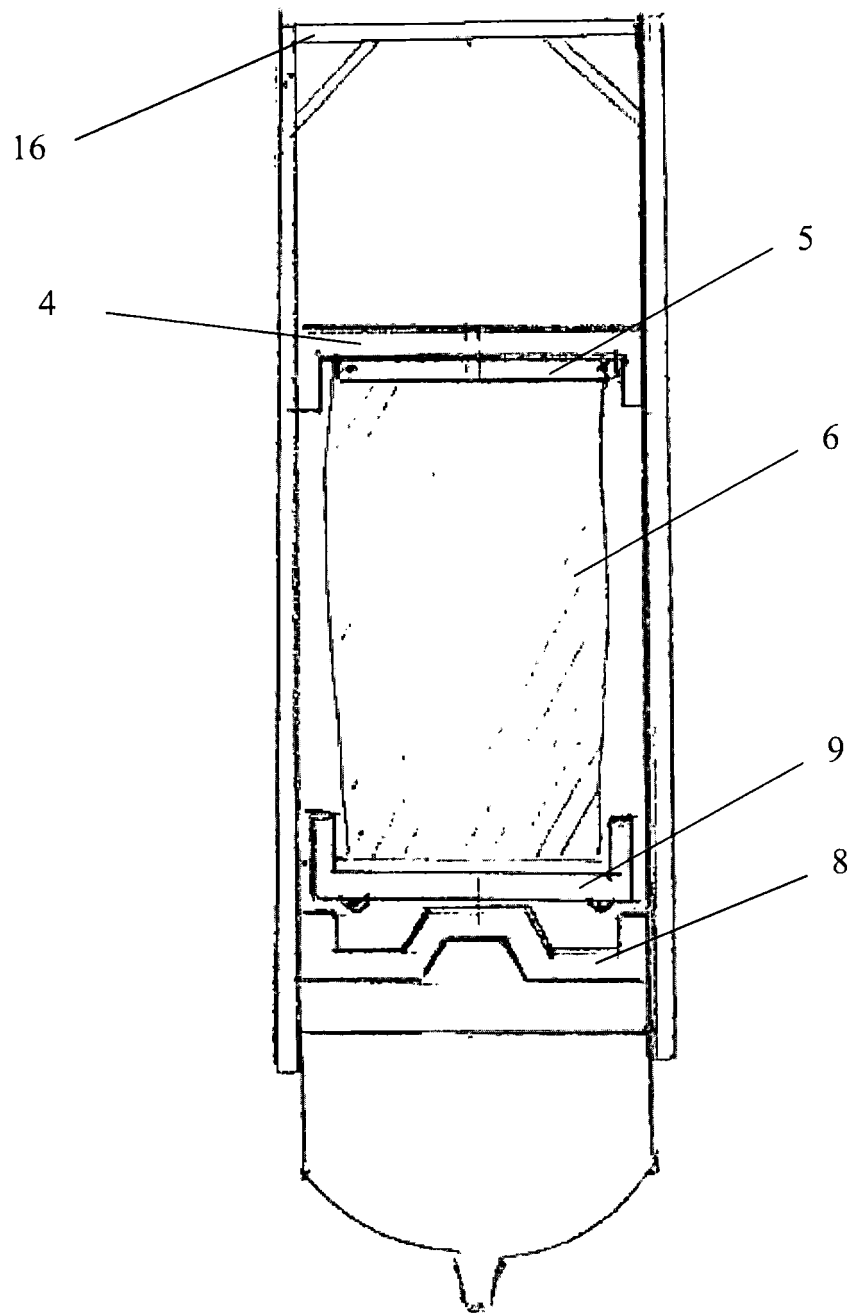


Fig. 11

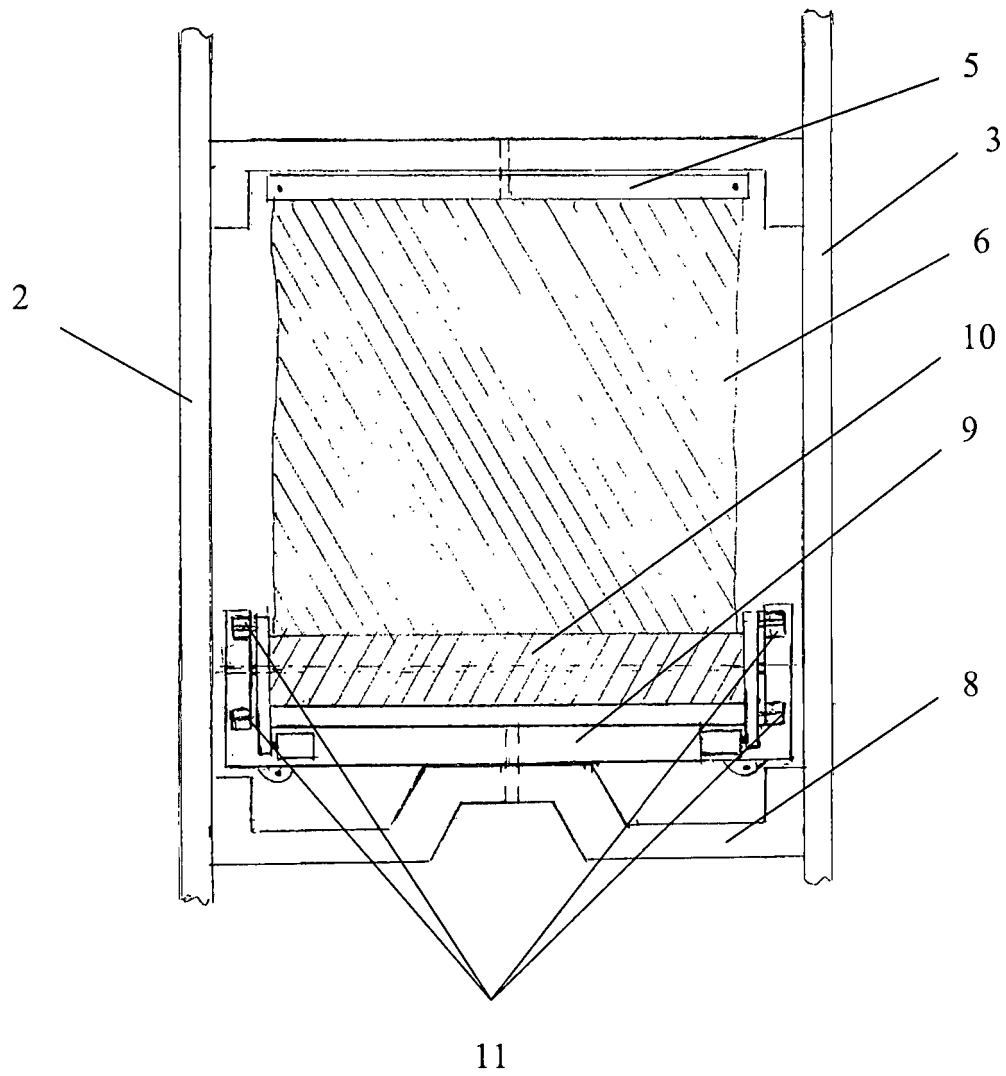


Fig. 12

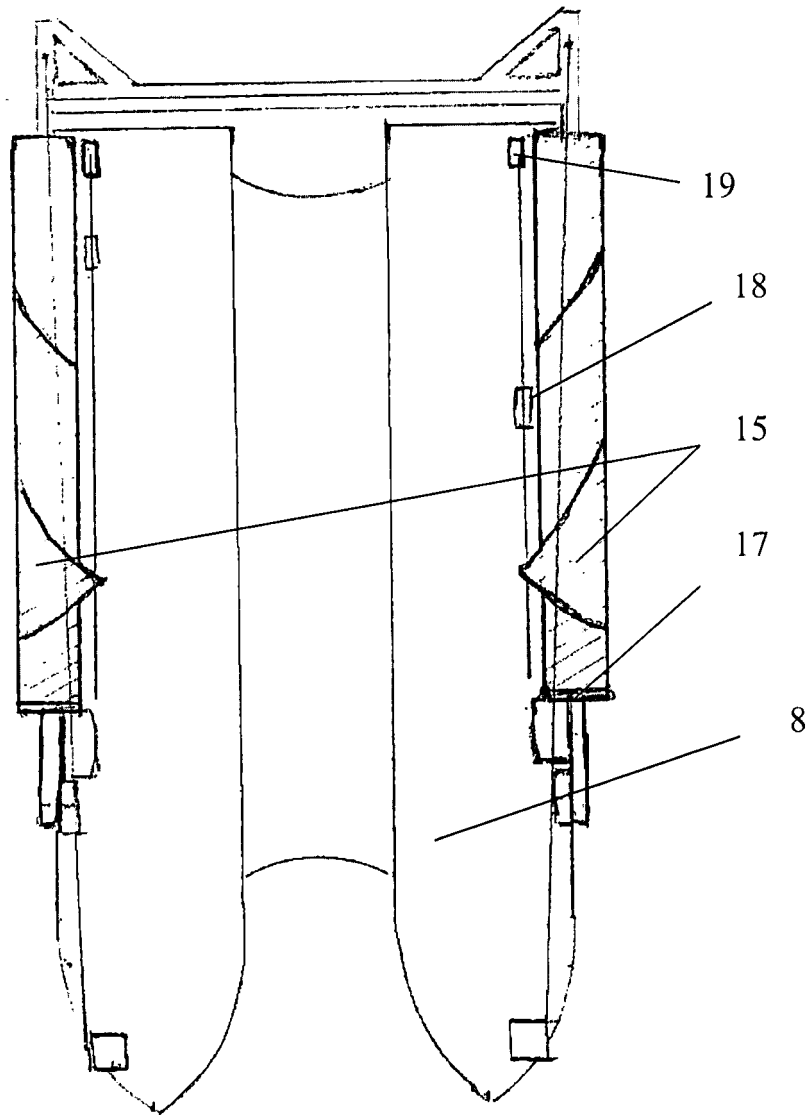


Fig. 13

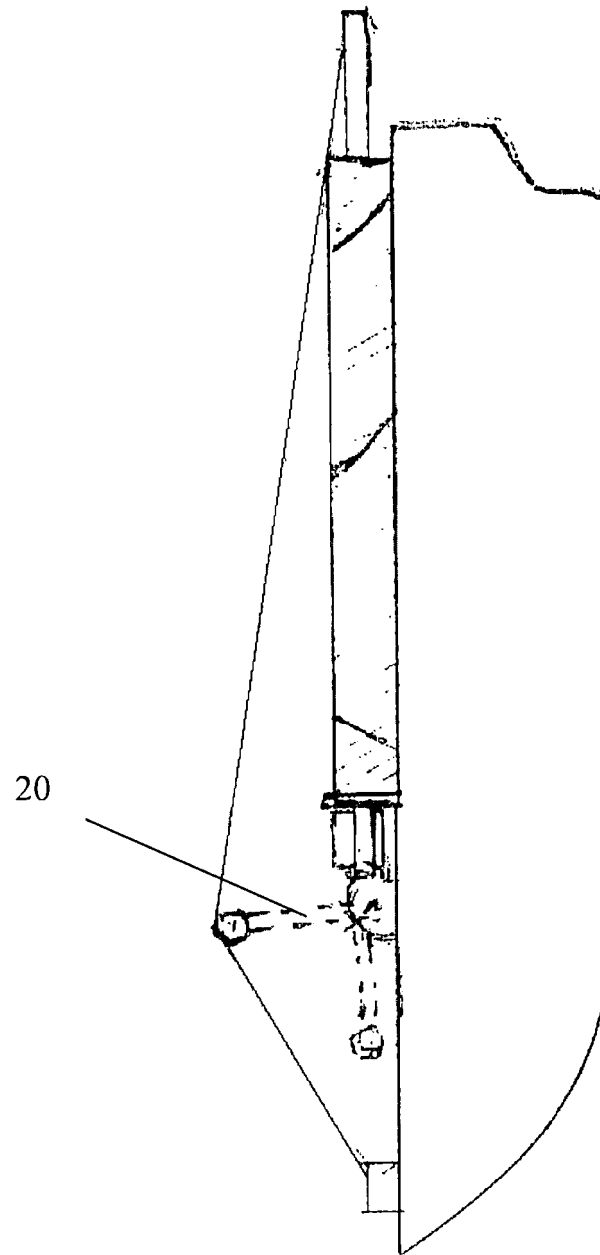


Fig. 14

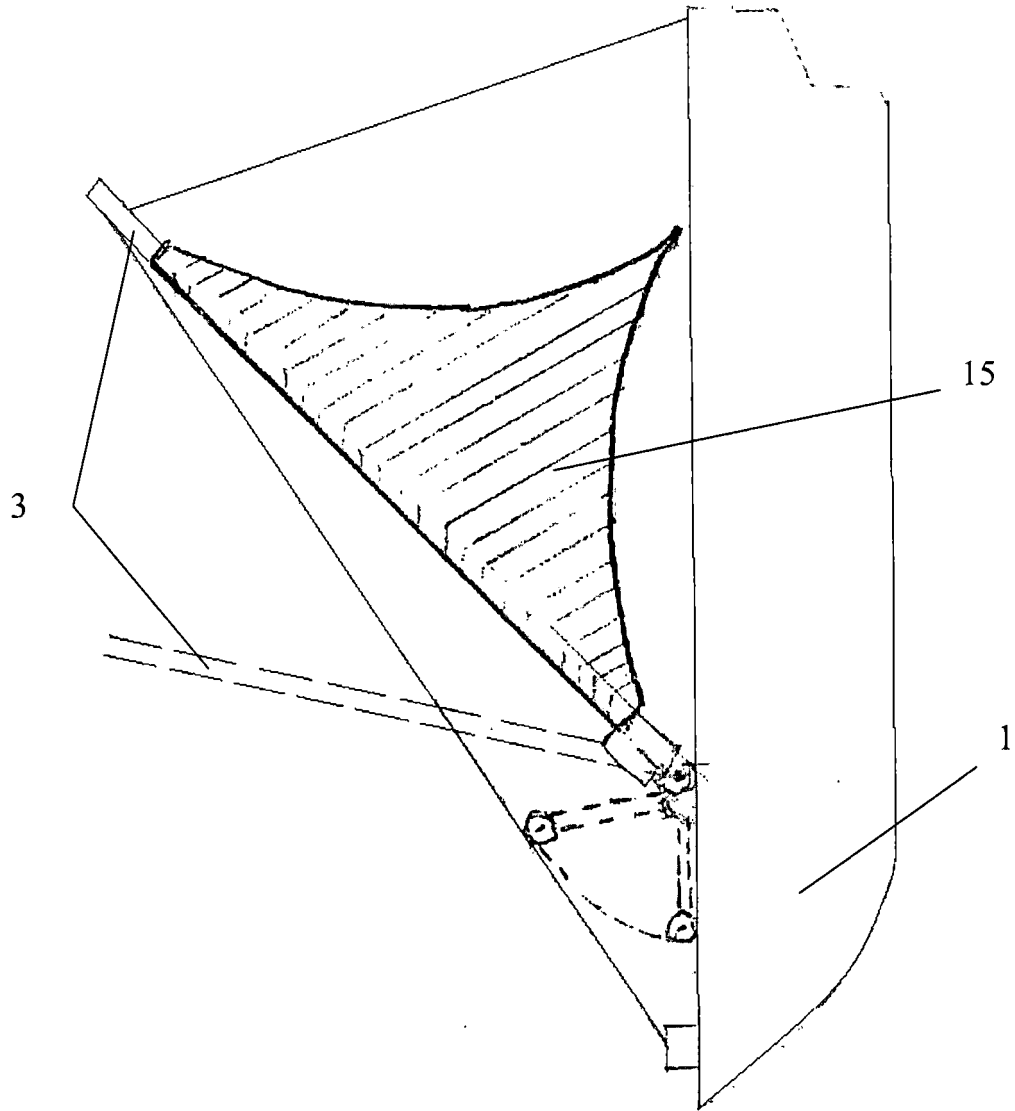


Fig. 15

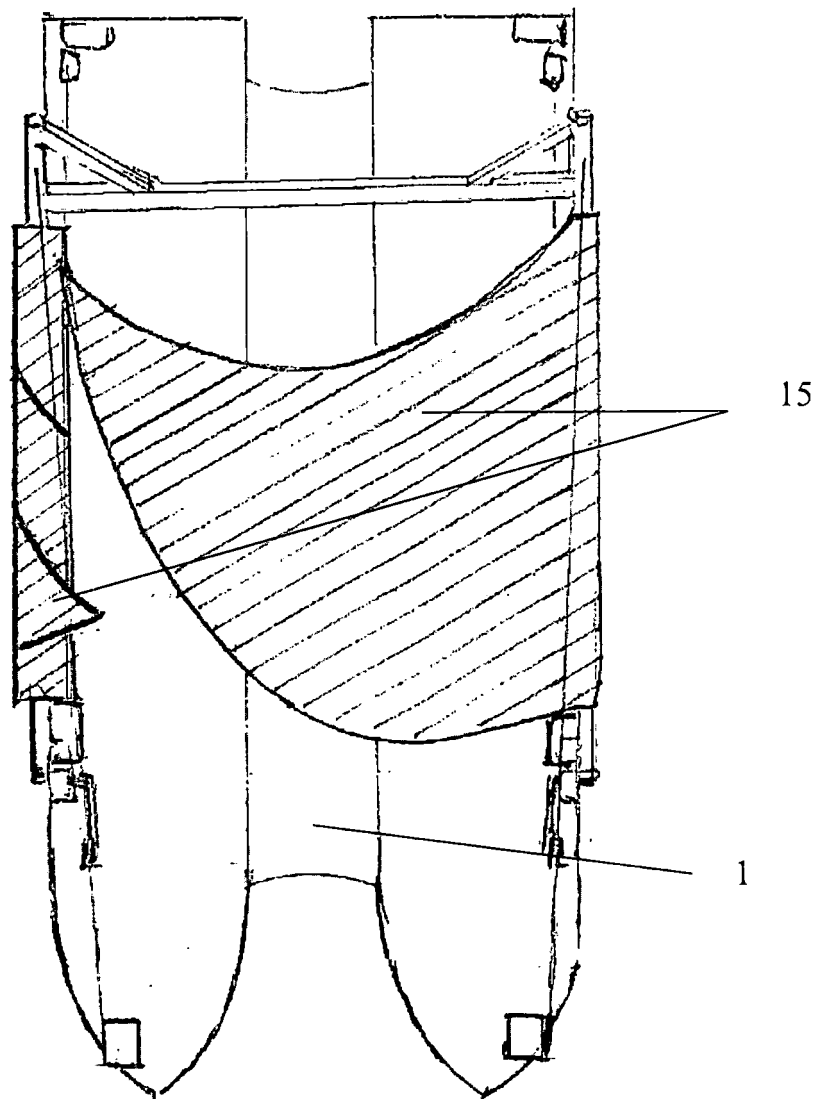


Fig. 16

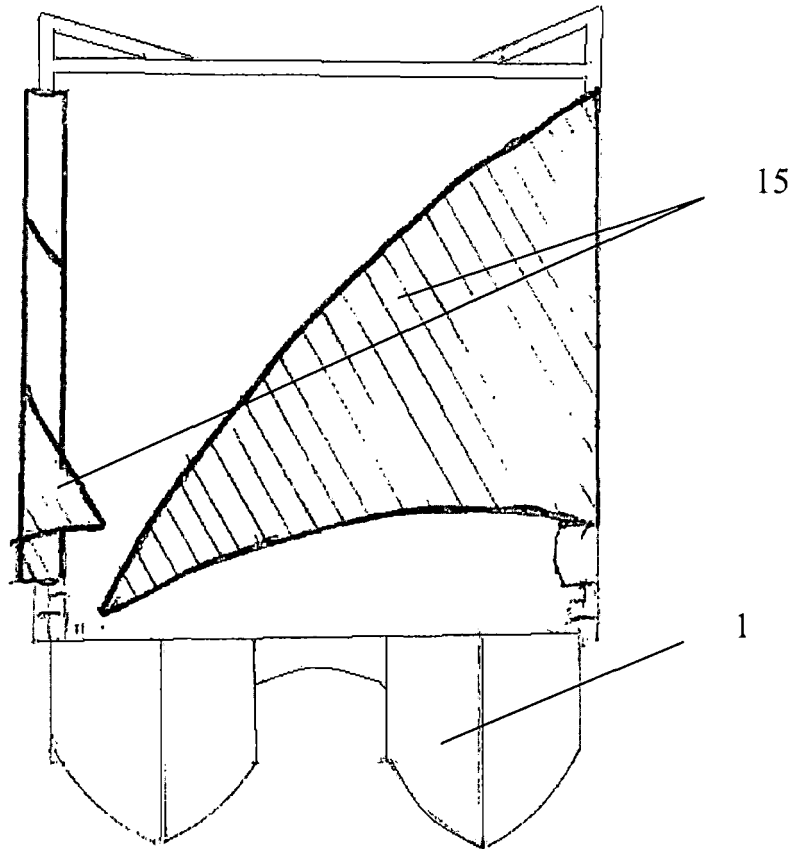


Fig. 17

INTERNATIONAL SEARCH REPORT

International application No.
PCT/UA2022/000017

A. CLASSIFICATION OF SUBJECT MATTER B63H 9/06, B63B 15/02, B63B 15/00 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC: B63H, B63B Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Espacenet		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CA 2793016 A1 (NEVEU ALAIN [CA]) 18 April 2014 (18.04.2014), fig. 1-6, the abstract	1, 3-15, 17, 18
X	GB 2385563 A (TEARE THOMAS DENYS GORDON [GB]) 27 August 2003 (27.08.2003), fig. 1, the abstract	1, 2, 9-12, 18
X	US 2020262530 A1 (HIGGINSON TIMOTHY V [US]) 20 August 2020 (20.08.2020), fig. 1, the abstract	1,9-12,14,15,17
X	US 11208187 B1 (CROSS WING TECH HOLDINGS LLC [US]) 28 December 2021 (28.12.2021), fig. 1, 3a, the abstract	1,3-6,8-15,17,18
A	JP S5718597 A (SENPAKU GIJUTSU KAIHATSU KK [JP]; HANSHIN DIESEL WORKS [JP]) 30 January 1982 (30.01.1982), fig. 1-4, the abstract	2, 16, 18
A	WO 0212058 A2 (DOYLE SAILMAKERS INC [US]) 14 February 2002 (14.02.2002), fig. 1, 2, the abstract	2, 16, 18
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 07 November 2022 (07.11.2022)		Date of mailing of the international search report 07 November 2022 (07.11.2022)
Name and mailing address of the ISA/ UA		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT
Information on patent family membersInternational application No.
PCT/UA2022/000017

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REFERENCES CITED IN THE DESCRIPTION

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