ELECTRIC SHIP CAPABLE OF FIRE PREVENTION AND SUPPRESSION

[Technical Field]

[0001] The present disclosure relates to an electric ship using a battery as a power source for a motor or the like.

[Background Art]

[0002] Recently, as electric vehicles have been receiving attention due to environmental issues and advances in battery technologies, there has also been an increasing demand for electric ships using batteries as power sources for motors or the like in the shipbuilding industry.

[0003] However, as is well known from fire accidents involving electric vehicles, an electric ship has a problem in that fire suppression is considerably difficult in case that a fire occurs due to thermal runaway or the like of a battery mounted in the electric ship, resulting in significant casualties.

[0004] For reference, in case of a fire accident involving an electric vehicle, a method of suppressing a fire by providing an immersion tank and immersing a battery of the electric vehicle in the immersion tank for a predetermined period of time or longer is generally used.

[0005] Therefore, there is an urgent need to perform research and development on an electric ship having a structure and a function capable of preventing a fire caused by a battery and quickly suppressing the fire even in case that the fire occurs.

[0006] As relevant documents of related art, there are Korean Patent No. 10-1517017 (entitled "BATTERY COOLING SYSTEM AND ELECTRIC BOAT USING THE SAME" and published on May 6, 2015), Korean Patent No. 10-1672261 (entitled "SHIP INCLUDING BATTERY" and published on November 3, 2016), and Korean Patent No. 10-2289709 (entitled "FIRE SUPPRESSION SYSTEM FOR BATTERY COMPARTMENT OF ELECTRIC PROPULSION SHIP" and published on August 13, 2021).

[Disclosure]

[Technical Problem]

[0007] An object of the present disclosure is to provide an electric ship capable of fire prevention and suppression, the electric ship being configured to use a battery as a power source for a motor or the like, prevent a fire caused by thermal runaway or the like of the battery, and quickly suppress the fire even in case that the fire occurs.

[Technical Solution]

[0008] The above-mentioned object is achieved by an electric ship capable of fire prevention and suppression according to one embodiment of the present disclosure, which uses a battery as a power source, the electric ship including: a hull left part; a hull right part disposed to be spaced apart from the hull left part; a hull bottom part configured to connect a lower portion of the hull left part and a lower portion of the hull right part; and a battery pack mounted in the electric ship, in which the battery pack is cooled by water introduced from the outside of the electric ship.

[0009] In particular, the electric ship may further include: a water inflow space formed by the hull bottom part between the hull left part and the hull right part and open rearward on a stern side so that water is introduced from the outside of the electric ship, in which the battery pack is disposed in the water inflow space.

[0010] In particular, the water inflow space may be filled with water introduced from the outside in a stopped state of the electric ship, and the water filled in the water inflow space may be discharged to the outside in a traveling state of the electric ship.

[0011] In particular, the water inflow space may serve as an immersion tank for suppressing a fire of the battery pack when a fire caused by the battery pack occurs.

[0012] In particular, the electric ship may further include: an inlet port formed through the hull bottom part so that water is introduced from the outside of the electric ship into a space in which

the battery pack is positioned while the electric ship travels.

[0013] In particular, the electric ship may further include: a cooling casing in which the battery pack is accommodated and into which water is introduced from the outside of the electric ship through the inlet port; and a drain port formed in the cooling casing on a side opposite to the inlet port so that water present in the cooling casing is discharged to the outside of the cooling casing.

[0014] In particular, the battery pack may be provided as a waterproof structure.

[0015] In particular, the hull left part and the hull right part may each be provided as a buoyancy unit including a tube member in an internal space thereof.

[Advantageous Effects]

[0016] The electric ship capable of fire prevention and suppression according to the embodiment of the present disclosure efficiently cools the battery pack by using water introduced from the outside of the electric ship, thereby exhibiting an effect of preventing a fire caused by the battery pack and quickly suppressing the fire even in case that the fire occurs.

[0017] In addition, according to the electric ship capable of fire prevention and suppression according to the embodiment of the present disclosure, the water inflow space, which is open rearward on the stern side so that water is introduced from the outside of the electric ship, is formed between the hull left part and the hull right part, and the battery pack is disposed in the water inflow space, such that the electric ship capable of fire prevention and suppression exhibits an effect of preventing a fire caused by the battery pack and more quickly suppressing the fire even in case that the fire occurs because the water inflow space filled with water serves as an immersion tank for suppressing a fire of the battery pack.

[Description of Drawings]

[0018] FIG. 1 is a perspective view illustrating an electric ship capable of fire prevention and suppression according to an embodiment of the present disclosure.

[0019] FIG. 2 is a front view illustrating the electric ship capable of fire prevention and suppression in FIG. 1 when viewed from a stern side.

[0020] FIG. 3 is a schematic view for explaining a cooling system of a battery pack applied to the electric ship capable of fire prevention and suppression according to the embodiment of the present disclosure.

[Best Mode]

[0021] In order to sufficiently understand the present disclosure, advantages in operation of the present disclosure, and the object to be achieved by carrying out the present disclosure, reference needs to be made to the accompanying drawings for illustrating exemplary embodiments of the present disclosure and contents disclosed in the accompanying drawings.

[0022] Hereinafter, the present disclosure will be described in detail by describing the exemplary embodiments of the present disclosure with reference to the accompanying drawings. However, in the description of the present disclosure, a description of a function or configuration already publicly known will be omitted in order to clarify the subject matter of the present disclosure.

[0023] FIG. 1 is a perspective view illustrating an electric ship capable of fire prevention and suppression according to an embodiment of the present disclosure, and FIG. 2 is a front view illustrating the electric ship capable of fire prevention and suppression in FIG. 1 when viewed from a stern side.

[0024] With reference to FIGS. 1 and 2, the electric ship capable of fire prevention and suppression according to the embodiment of the present disclosure (hereinafter, referred to as an "electric ship") includes a hull left part 110, a hull right part 120, a hull bottom part 130, a hull bow part 140, a transom 150, a water inflow space 160, and a battery pack 170. Meanwhile, in the present specification, the term "ship" is used to include various boats or ships, such as boats, fishing boats, and merchant ships.

[0025] As illustrated in FIGS. 1 and 2, the hull left part 110 and the hull right part 120 extend to be elongated from a bow side toward a stern side and are disposed in parallel with each other in a state in which the hull left part 110 and the hull right part 120 are spaced apart from each other. The hull left part 110 and the hull right part 120 have substantially the same configuration except that the hull left part 110 and the hull right part 120 are respectively disposed on the left and right sides and symmetric vertically. For reference, in the present specification, the terms "left" and "right" are defined based on a view from the stern side toward the bow side of the electric ship.

[0026] In this case, the hull left part 110 and the hull right part 120 may be manufactured from a board made of synthetic resin (plastic), such as high-density polyethylene (HDPE), or a board made of metal. Specifically, the hull left part 110 and the hull right part 120 may be manufactured by preparing respective components, through a process of CNC cutting a board made of synthetic resin or metal based on a CAD design drawing and bending the board, and then assembling the components through a bolting process. In particular, the hull left part 110 and the hull right part 120 may be manufactured from a board made of high-density polyethylene (HDPE) that is lightweight and has excellent strength and elasticity and thus may be resistant to external impacts and ensure durability even in cold weather.

[0027] Furthermore, the hull bottom part 130, the hull bow part 140, and the like, which will be described below and constitute the exterior of the electric ship according to the present disclosure, together with the hull left part 110 and the hull right part 120, may also be manufactured through the processes described above, and assembly among the hull left part 110, the hull right part 120, the hull bottom part 130, and the hull bow part 140 may also be performed by a bolting process.

[0028] Therefore, because the electric ship according to the present disclosure may be entirely assembled through a simple bolting process, a welding process requiring a skilled worker or a hull mold required for manufacturing an FRP boat is not needed, and as a result, the electric ship has

advantages in that an unskilled worker may be employed, labor costs may be reduced, and furthermore, the electric ship is suitable for establishment of an automated production line, thereby improving productivity and facilitating standardization and maintenance. In addition, because the electric ship according to the present disclosure may significantly reduce noise, dust, odors, and waste generated during a production process thereof in comparison with boats in the related art, the electric ship has advantages in that the electric ship is environmentally friendly, a factory may be operated even in a large city or a residential area, and manpower required for production thereof may be smoothly supplied.

[0029] Meanwhile, the hull left part 110 and the hull right part 120 may each be provided as a buoyancy unit, and specifically, as illustrated in FIG. 2, at least one tube member (not illustrated) may be accommodated in an internal space thereof. As a gas is injected into the tube member, the tube member presses inner surfaces of boards constituting the hull left part 110 and the hull right part 120, and as a result, the boards may expand together with the tube member and be formed to be convex outward.

[0030] The hull left part 110 and the hull right part 120, having such a structure, may ensure sufficient and stable buoyancy by the tube member accommodated in the internal space thereof, and the soft tube member may be protected from external impacts by the hard boards constituting the hull left part 110 and the hull right part 120. Therefore, even when the hull is partially damaged, the electric ship according to the present disclosure may maintain buoyancy and thus may not sink.

[0031] As illustrated in FIG. 2, the hull bottom part 130 connects a lower portion of the hull left part 110 and a lower portion of the hull right part 120. Specifically, a left end of the hull bottom part 130 is coupled to the hull left part 110 by bolting, and a right end of the hull bottom part 130 is coupled to the hull right part 120 by bolting, such that the hull bottom part 130 may connect the

lower portion of the hull left part 110 and the lower portion of the hull right part 120. Meanwhile, the hull bottom part 130 may be provided to cover only a part of the lower portion of the hull left part 110 and a part of the lower portion of the hull right part 120 or provided to cover the entire lower portion of the hull left part 110 and the entire lower portion of the hull right part 120.

[0032] The hull bottom part 130 forms a bottom portion of the electric ship according to the present disclosure together with the lower portion of the hull left part 110 and the lower portion of the hull right part 120, thereby enabling stable planing while the electric ship travels. To this end, as illustrated in FIG. 2, the hull bottom part 130 may have a structure inclined downward from two opposite sides thereof toward a central portion thereof. For example, the hull bottom part 130 may have an approximately 'V' cross-sectional shape, as a whole.

[0033] In particular, as described above, the hull bottom part 130 may be manufactured by preparing respective components, through a process of CNC cutting a board made of high-density polyethylene (HDPE) based on a CAD design drawing and bending the board, and then assembling the components through a bolting process. Further, the hull bottom part 130 may be coupled to the hull left part 110 and the hull right part 120 by a bolting process and connect the lower portion of the hull left part 110 and the lower portion of the hull right part 120. However, the present disclosure is not limited thereto. The hull bottom part 130 may be formed integrally with the hull left part 110 and the hull right part 120. Furthermore, the shape and structure of the hull bottom part 130 may, of course, be appropriately modified as necessary without being limited to those illustrated in the accompanying drawings.

[0034] Meanwhile, the hull bottom part 130 is additionally coupled to the hull left part 110 and the hull right part 120 by a first reinforcement frame 131 and a second reinforcement frame 132 disposed to be elongated from the stern side toward the bow side, as illustrated in FIGS. 1 and 2, in order to improve structural strength or rigidity. In a state in which the first reinforcement frame

131 is disposed in a space between the hull left part 110 and the hull bottom part 130, an upper end of the first reinforcement frame 131 is coupled to the hull left part 110 by bolting, and a lower end of the first reinforcement frame 131 is coupled to the hull bottom part 130 by bolting. Further, in a state in which the second reinforcement frame 132 is disposed in a space between the hull right part 120 and the hull bottom part 130, an upper end of the second reinforcement frame 132 is coupled to the hull right part 120 by bolting, and a lower end of the second reinforcement frame 132 is coupled to the hull bottom part 130 by bolting.

[0035] The hull bow part 140, as its designation indicates, provides a bow of the electric ship according to the present disclosure, and functions to cut through water during the operation of the electric ship. In addition, the hull bow part 140 is coupled to the hull left part 110 and the hull right part 120 on the bow side of the electric ship. Specifically, as illustrated in FIGS. 1 and 2, a left end of the hull bow part 140 may be coupled to the hull left part 110 by bolting, and a right end of the hull bow part 140 may be coupled to the hull right part 120 by bolting.

[0036] In particular, as described above, the hull bow part 140 may be manufactured by preparing respective components, through a process of CNC cutting a board made of high-density polyethylene (HDPE) based on a CAD design drawing and bending the board, and then assembling the components through a bolting process. Further, the hull bow part 140 may be coupled to the hull left part 110 and the hull right part 120 through a bolting process and connect the hull left part 110 and the hull right part 120 on the bow side of the electric ship. However, the present disclosure is not limited thereto. The hull bow part 140 may be formed integrally with the hull left part 110 and the hull right part 120. Furthermore, the shape and structure of the hull bow part 140 may, of course, be appropriately modified as necessary without being limited to those illustrated in the accompanying drawings.

[0037] The transom 150 is a means on which a driving motor or an outboard motor is mounted.

As illustrated in FIGS. 1 and 2, the transom 150 is installed on the stern side of the electric ship so as to extend in a transverse direction over an upper portion of the hull left part 110 and an upper portion of the hull right part 120. In this case, in order to reinforce weak rigidity due to the space between the hull left part 110 and the hull right part 120, i.e., the water inflow space 160, the transom 150 may include a reinforcement frame (not illustrated) that, although not illustrated in the accompanying drawings, extends from a central portion to the hull bottom part 130 and is coupled to the hull bottom part 130. However, the electric ship according to the present disclosure is not limited to the structure and shape of the transom 150 illustrated in the accompanying drawings, and may be appropriately modified to have a transom having various other structures and shapes.

[0038] As illustrated in FIG. 2, the water inflow space 160 is formed by the hull bottom part 130 between the hull left part 110 and the hull right part 120 and is open rearward on the stern side of the electric ship so that water is introduced from the outside of the electric ship. That is, the water inflow space 160 is provided as a space defined by the hull left part 110 and the hull right part 120, which are disposed to be spaced apart from each other, and the hull bottom part 130, and the water inflow space 160 has a structure open rearward so that water is introduced from the outside of the electric ship. For reference, in the present specification, the term "water" means seawater in case that the electric ship operates at sea, and means river water or lake water in case that the electric ship operates in a river or a lake.

[0039] In this case, in a stopped state of the electric ship, the water inflow space 160 is filled with water introduced from the outside of the electric ship, and in a traveling state of the electric ship, the water filled in the water inflow space 160 is discharged to the outside of the electric ship.

[0040] As described above, in the electric ship according to the present disclosure, the lower portion of the hull left part 110 and the lower portion of the hull right part 120 disposed to be

spaced apart from each other are connected to each other by the hull bottom part 130, and the water inflow space 160 is formed by the hull bottom part 130 between the hull left part 110 and the hull right part 120, such that, in the stopped state of the electric ship, the water inflow space 160 is filled with water introduced from the outside of the electric ship, thereby exhibiting characteristics of a catamaran (twin-hull ship), thereby stabilizing a center of buoyancy and reducing risks of rolling and capsizing. Further, because water introduced into the inside of the hull is spontaneously discharged (drained) to the outside of the electric ship like a raft, a bilge pump is not needed, and internal water cleaning is easy. In the traveling state of the electric ship, as the water filled in the water inflow space 160 is discharged to the outside of the electric ship, characteristics of a monohull are exhibited, thereby increasing an area in contact with water and improving planing performance and fuel efficiency (electric power efficiency).

[0041] In addition, because the electric ship according to the present disclosure may implement the hull, which is lightweight and has excellent strength and rigidity, by the hull left part 110, the hull right part 120, the hull bottom part 130, and the hull bow part 140 having the structures as described above, the electric ship may be considered very suitable for the electric ship on which the heavy battery pack 170 is mounted.

[0042] The battery pack 170 is mounted in the electric ship as a power source that supplies electric power required for a motor (or an outboard motor) or the like for driving the electric ship according to the present disclosure. As illustrated in FIGS. 1 and 2, the battery pack 170 may be disposed in the water inflow space 160. That is, the battery pack 170 is disposed in a state in which the battery pack 170 is accommodated in the water inflow space 160 provided as the space defined by the hull left part 110, the hull right part 120, and the hull bottom part 130 spaced apart from one another as described above. In this case, as illustrated in FIGS. 1 and 2, the battery pack 170 may be mounted in a state in which the battery pack 170 is securely fixed onto a battery support frame

175 installed in the water inflow space 160. For reference, the battery pack 170 may be any one of various battery products, representatively including a lithium-ion battery, and may be provided in a packaged structure in which a plurality of battery cells or battery modules are arranged, and various components for control are mounted.

[0043] In this case, the water filled in the water inflow space 160 serves as a coolant for cooling the battery pack 170, thereby preventing a fire caused by thermal runaway or the like of the battery pack 170. Further, the water inflow space 160 serves as an immersion tank for suppressing a fire of the battery pack 170 in case that a fire occurs due to thermal runaway or the like of the battery pack 170. Specifically, in case that a fire caused by the battery pack 170 occurs while the electric ship is moored in the stopped state or while the battery is being charged, the water inflow space 160 may serve, in a state filled with water, as an immersion tank for suppressing the fire of the battery pack 170. Further, in case that a fire caused by the battery pack 170 occurs while the electric ship is in the traveling state, the operation of the motor stops, and the electric ship stops, such that the water inflow space 160 may be filled with water introduced from the outside of the electric ship and serve as an immersion tank for suppressing the fire of the battery pack 170.

[0044] Meanwhile, the battery pack 170 may be provided with a waterproof structure because the battery pack 170 is mounted in the water inflow space 160 and immersed in the water filled in the water inflow space 160. For example, the battery pack 170 may be provided with a structure in which the battery pack 170 is waterproof-coated or accommodated in a waterproof casing.

[0045] As described above, in the electric ship according to the present disclosure, the battery pack 170 is disposed in the water inflow space 160, such that, even in case that a fire caused by the battery pack 170 occurs, the water inflow space 160 filled with water serves as an immersion tank for the battery pack 170, thereby quickly suppressing the fire. Further, the water filled in the water inflow space 160 serves as a coolant to prevent in advance the battery pack 170 from

overheating, thereby preventing a fire caused by the battery pack 170.

[0046] FIG. 3 is a schematic view for explaining a cooling system of the battery pack applied to the electric ship capable of fire prevention and suppression according to the embodiment of the present disclosure.

[0047] With reference to FIGS. 1 to 3, the electric ship capable of fire prevention and suppression according to the embodiment of the present disclosure (hereinafter, referred to as the "electric ship") includes the hull left part 110, the hull right part 120, the hull bottom part 130, the hull bow part 140, the transom 150, the water inflow space 160, and the battery pack 170 described above and further includes an inlet port 181, a cooling casing 185, and a drain port 187 as a system for cooling the battery pack 170 by using water introduced from the outside of the electric ship even in case that the electric ship is in the traveling state in which there is no water filled in the water inflow space 160 or furthermore, in case of the electric ship having no water inflow space 160. In this case, water introduced from the outside of the electric ship cools the battery pack 170, which is mounted in the electric ship, and then is discharged to the outside of the electric ship.

[0048] The inlet port 181 is formed through the hull bottom part 130, which comes into contact with seawater or river water, such that water is introduced from the outside of the electric ship into a space in which the battery pack 170 is positioned while the electric ship travels. In the present embodiment, the "space in which the battery pack is positioned" refers to an internal space of the cooling casing 185 in which the battery pack 170 is accommodated. However, the present disclosure is not limited thereto, and the "space in which the battery pack is positioned" may be the water inflow space 160 or the like in an embodiment in which the cooling casing 185 is not provided.

[0049] In this case, as illustrated in FIG. 3, the inlet port 181 may be formed through a V-hull bottom of the hull bottom part 130 so that water is smoothly introduced from the outside of the

electric ship while the electric ship travels. Further, the inlet port 181 may be formed to be directed toward the bow side (front side) of the electric ship in consideration of forward traveling of the electric ship.

[0050] As illustrated in FIG. 3, the cooling casing 185 defines an internal space in which the battery pack 170 is accommodated. That is, the battery pack 170 is structured to be accommodated in the cooling casing 185 and disposed in the water inflow space 160. In this case, the battery pack 170 is accommodated in the cooling casing 185 after being waterproofed with a waterproof coating or a waterproof casing. For reference, the replacement of the battery pack 170 may be performed in a manner of replacing the entire cooling casing 185 in which the battery pack 170 is accommodated. The cooling casing 185 may be made of an aluminum material having excellent thermal conductivity and corrosion resistance.

[0051] Further, water is introduced into the internal space of the cooling casing 185 from the outside of the electric ship through the inlet port 181. In this case, as illustrated in FIG. 3, the inlet port 181 is connected to the inside of the cooling casing 185 through an inlet pipe 183, such that water outside the electric ship is introduced into the electric ship through the inlet port 181 and introduced into the cooling casing 185 through the inlet pipe 183. In this case, the inlet pipe 183 is provided with a structure and a shape that do not restrict a flow of water introduced through the inlet port 181. The present disclosure is not limited to the structure and shape illustrated in FIG. 3, and the structure and shape may be appropriately modified, as necessary.

[0052] Meanwhile, although not illustrated in the accompanying drawings, an inlet valve (not illustrated) may be installed in the inlet pipe 183, and the inlet valve adjusts the amount of water introduced into the cooling casing 185 through the inlet port 181. In this case, an opening amount of the inlet valve may be controlled to adjust the amount of water introduced into the cooling casing 185 in accordance with a temperature of the battery pack 170. Specifically, the opening

amount of the inlet valve may be controlled such that the amount of water introduced into the cooling casing 185 increases when the temperature of the battery pack 170 increases, and the opening amount thereof may be controlled such that the amount of water introduced into the cooling casing 185 decreases when the temperature of the battery pack 170 decreases. Meanwhile, the inlet valve may completely block the inlet port 181 as needed so that water is not introduced into the cooling casing 185.

[0053] As illustrated in FIG. 3, the drain port 187 is formed in the shape of a pipe in the cooling casing 185 on a side opposite to the inlet port, i.e., on the stern side of the electric ship, and the water, which is introduced through the inlet port 181 and is present in the cooling casing 185, is discharged to the outside of the cooling casing 185 through the drain port 187. In this case, the water discharged to the outside of the cooling casing 185 through the drain port 187 may be discharged to the outside of the electric ship through an open rear side of the water inflow space 160. However, in case of an electric ship without the water inflow space 160, the drain port 187 may be elongated to the outside of the electric ship so that water inside the cooling casing 185 is directly discharged to the outside of the electric ship.

[0054] The electric ship according to the embodiment of the present disclosure to which the above-mentioned cooling system is applied may prevent a risk caused by an increase in the temperature of the battery pack 170 and prevent a fire caused by thermal runaway of the battery pack 170, by allowing water introduced from the outside of the electric ship through the inlet port 181 during travel to flow into the cooling casing 185 and cool the battery pack 170 accommodated in the cooling casing 185. In a thermal runaway situation in which the temperature of the battery pack 170 consistently increases despite the cooling system, the electric ship according to an embodiment of the present disclosure may stop the operation of the motor to stop the electric ship, thereby allowing water to immediately flow into the water inflow space 160 from the outside of

the electric ship, preparing for an explosion of the battery pack 170, and quickly suppressing a fire even in case that the fire occurs. Further, even in case that the battery pack 170 explodes, the electric ship according to the embodiment of the present disclosure may minimize casualties because a significant amount of water filled in the cooling casing 185 and the water inflow space 160 provides a cushioning action.

[0055] While the present disclosure has been described above in detail with reference to the exemplary embodiments of the present disclosure, it will be apparent to those skilled in the art that the present disclosure is not limited to the above-mentioned exemplary embodiments, and the present disclosure may be variously altered and modified without departing from the spirit and scope of the present disclosure. The changed and modified examples belong to the claims of the present disclosure.

[Industrial Applicability]

[0056] The present disclosure may be widely used in the field of manufacturing various electric ships using batteries as power sources for motors or the like.

CLAIMS

1. An electric ship capable of fire prevention and suppression, which uses a battery as a power source, the electric ship comprising:

a hull left part;

a hull right part disposed to be spaced apart from the hull left part;

a hull bottom part configured to connect a lower portion of the hull left part and a lower portion of the hull right part; and

a battery pack mounted in the electric ship,

wherein the battery pack is cooled by water introduced from the outside of the electric ship.

2. The electric ship of claim 1, further comprising:

a water inflow space formed by the hull bottom part between the hull left part and the hull right part and open rearward on a stern side so that water is introduced from the outside of the electric ship,

wherein the battery pack is disposed in the water inflow space.

3. The electric ship of claim 2, wherein the water inflow space is filled with water introduced from the outside in a stopped state of the electric ship, and the water filled in the water inflow space is discharged to the outside in a traveling state of the electric ship.

4. The electric ship of claim 3, wherein the water inflow space serves as an immersion tank for suppressing a fire of the battery pack when a fire caused by the battery pack occurs.

5. The electric ship of claim 1, further comprising:

an inlet port formed through the hull bottom part so that water is introduced from the outside of the electric ship into a space in which the battery pack is positioned while the electric ship travels.

6. The electric ship of claim 5, further comprising:

a cooling casing in which the battery pack is accommodated and into which water is introduced from the outside of the electric ship through the inlet port; and

a drain port formed in the cooling casing on a side opposite to the inlet port so that water present in the cooling casing is discharged to the outside of the cooling casing.

7. The electric ship of claim 1, wherein the battery pack is provided as a waterproof structure.

8. The electric ship of claim 1, wherein the hull left part and the hull right part are each provided as a buoyancy unit comprising a tube member in an internal space thereof.