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(54) **PUSHBUTTON PANEL FOR A NAUTICAL ELECTRO-MECHANISM**

(57) The invention relates to a pushbutton panel (100) for controlling a nautical electro-mechanism comprising a housing (20), an electronic control unit (50), for electrical connection to the nautical electro-mechanism to be controlled, and means (30) for operating the nautical electro-mechanism positioned within the housing (20) and in electrical communication with the electronic con-

trol unit (50). The operating means (30) comprise a first (31) and a second push button switch (32), each configured to operate the nautical electro-mechanism according to a respective direction of rotation and the housing (20) comprises a base (21), from which a partition (28), for separating the first (31) and the second push button switch (32) rises.

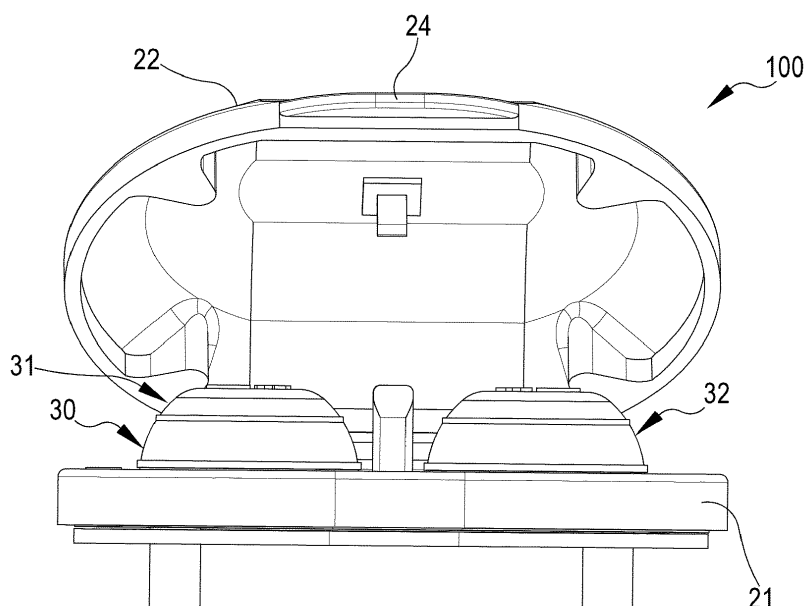


FIG.2

Description

Technical field of the invention

[0001] The present invention relates in general to the technical field of nautical equipment. More in particular, the invention relates to a pushbutton panel with a double control switch for a nautical electro-mechanism.

Background art of the invention

[0002] Various electro-mechanisms, used to effortlessly perform operations for tensioning ropes or lines, are installed on pleasure craft, yachts, ships and the like.

[0003] For example, motorized electro-mechanisms that require, for their operation, a power supply and an operating push button controllable by the crew are available. This category includes motorized winches, motorized capstans, motorized windlasses and motorized cleats, i.e., devices that are operated by a motor, typically positioned below deck, to wind the rope or line in order to take it to desired tension.

[0004] The operating push button of the aforesaid electro-mechanisms is typically a pedal push button, i.e. of the type suitable to be operated with the foot, and is typically provided with a fixed structure in which the circuitry is housed, permanently constrained to the craft or to the related electro-mechanism to be controlled, and a corresponding movable structure, which can be translated or deformed by the user, comprising the electrical switch that closes/opens the electrical circuit. The pedal push button is also sealed to prevent the infiltration of water or moisture that would oxidize the circuitry.

[0005] However, the pedal push buttons conventionally used in the nautical field have some problems. In the circuitry conventionally installed on a known pedal push button, the push button manages only one direction of rotation. In fact, this is an on/off type device, in the sense that, when the push button is pressed with the foot, the motor of the motorized electro-mechanism rotates so as to tension the rope or line and, once the desired tension is reached, rotation of the motor is interrupted by lifting the foot off the pedal.

[0006] Consequently, with pedal push buttons of known type it is not possible to control the two directions of rotation of the operating motor of a nautical electro-mechanism, such as a motorized winch. Therefore, if the motorized winch is required to rotate in the opposite direction to the direction for tensioning the rope or line, i.e., to loosen or slacken the rope or line, a second pedal push button must be provided, typically positioned in close proximity to the tensioning push button.

[0007] Naturally, this is inconvenient, as it lengthens and complicates the installation times of motorized electro-mechanisms on the craft.

Summary of the invention

[0008] Therefore, the main object of the present invention is to provide a pushbutton panel for applications in the nautical field, i.e., a pushbutton panel for controlling motorized or in any case electrically powered nautical electro-mechanisms, which simply and effectively solves the drawback of conventional push buttons.

[0009] More in particular, the main object of the present invention is to provide a pushbutton panel for controlling a nautical electro-mechanism configured to allow the user to rotate the electro-mechanism in both directions of rotation according to necessity.

[0010] Yet another object of the present invention is to provide a pushbutton panel for controlling a nautical electro-mechanism configured to receive in input the lowest possible voltage, regardless of the power supply voltage.

[0011] Yet another object of the present invention is to provide a pushbutton panel for controlling a nautical electro-mechanism configured to prevent a possible short-circuit in the presence of faults, of incorrect use of the pushbutton panel and/or of infiltration of water into the motor for operating the nautical electro-mechanism to be controlled.

[0012] Not least object of the present invention is to provide a pushbutton panel for controlling a nautical electro-mechanism, which can be produced in less time and at lower costs with respect to those required to produce conventional pedal push buttons.

[0013] These and other objects, which will be more apparent in the following of the present description, are achieved by a pushbutton panel for controlling a nautical electro-mechanism according to the independent claim 1. Preferred features of the pushbutton panel for controlling a nautical electro-mechanism are set forth in the dependent claims 2 to 10.

[0014] The invention therefore relates to a pushbutton panel for controlling a nautical electro-mechanism comprising a housing, an electronic control unit, for electrical connection of the pushbutton panel to the nautical electro-mechanism to be controlled, and means for operating the nautical electro-mechanism positioned within the housing and in electrical communication with the electronic control unit.

[0015] The pushbutton panel is characterized in that the operating means comprise a first and a second push button switch, each configured to operate the nautical electro-mechanism according to a respective direction of rotation, and in that the housing comprises a base from which a partition, for separating the first and the second push button switches, rises.

[0016] Due to this combination of features, and in particular due to the fact of providing two push button switches suitably separated from each other, it is possible to obtain a pushbutton panel with integrated double control, i.e., capable of allowing the user to rotate, in a reliable manner and without the possibility of error, the electro-mechanism in both directions of rotation according to ne-

cessity. In particular, the presence of a partition, for separating the first and the second push button switches advantageously facilitates the user in operation of the desired push button switch, depending on the direction of rotation to be imparted to the nautical electro-mechanism to be controlled.

Brief description of the drawings

[0017] Further features and advantages of the present invention will be more apparent from the following detailed description of some preferred embodiments thereof, provided below by way of non-limiting example, with reference to the accompanying drawings. In the drawings:

- Figure 1 is a perspective view of a pushbutton panel for controlling a nautical electro-mechanism according to a preferred embodiment of the present invention, with the housing in closed configuration;
- Figure 2 is a front view of the pushbutton panel of Figure 1, with the housing in open configuration or for access to the push button switches for operating the nautical electro-mechanism to be controlled;
- Figure 3 is a side view of the pushbutton panel of Figure 1;
- Figure 4 is a sectional view of the pushbutton panel of Figure 1;
- Figure 5 is a further sectional view of the pushbutton panel of Figure 1; and
- Figure 6 is a side view of a pushbutton panel for controlling a nautical electro-mechanism according to an alternative embodiment of the present invention, with the housing in open configuration or for access to the push button switches for operating the nautical electro-mechanism to be controlled; and
- Figure 7 shows a circuit diagram of the electronic control unit of the pushbutton panel according to the invention.

Detailed description of preferred embodiments of the invention

[0018] With reference to Figures 1 to 4, these illustrate a pushbutton panel for controlling a nautical electro-mechanism according to a preferred embodiment of the present invention.

[0019] The pushbutton panel, indicated in general with the reference number 100, comprises a housing 20 and electrical operating means 30 of a nautical electro-mechanism that the pushbutton panel 100 is destined to control, the electrical operating means 30 being positioned within the housing 20.

[0020] The housing 20 comprises a base 21, constrainable, permanently or removably, to an external structure, typically the bridge of a craft, and a cover 22 coupled on top of the base 21 and movable with respect to the base 21 between a closed condition of the housing 20 (see

Figure 1), in which access to the electrical operating means 30 is prevented, and an open condition of the housing 20 (see Figure 2), in which a user has access to the electrical operating means 30 positioned within the housing 20.

[0021] In the embodiment illustrated in Figures 1 to 4, the cover 22 is pivoted to the base 21 by means of a hinge 23. Naturally, alternative coupling means can be provided between base 21 and cover 22, such as interlocking coupling means, for example by providing the cover 22 with elastic flaps that engage in corresponding seats formed in the base 21.

[0022] The cover 22 preferably has a tab 24, projecting frontally therefrom and which, when grasped by the user, facilitates opening and closing of the housing 20.

[0023] Preferably the base 21 and the cover 22 of the housing 20 are made of stainless steel.

[0024] The electrical operating means 30 comprise a first push button switch 31 and a second push button switch 32, preferably of pedal type.

[0025] Each push button switch 31 and 32 is configured to operate the nautical electro-mechanism according to a respective direction of rotation. By way of an example, and assuming that the nautical electro-mechanism is a motorized winch, the first push button switch 31 of the pushbutton panel 100 is configured to rotate the motorized winch according to a first direction of rotation, so as to obtain tensioning of a rope or line, while the second push button switch 32 is configured to rotate the motorized winch in conformity with a second direction of rotation, opposite to the first, thus obtaining slackening of the rope or line. Naturally, and in a completely equivalent way, the first push button switch can be operated to slacken the rope or line and the second push button switch can be operated to tension the rope or line.

[0026] As shown in more detail in Figure 4, each push button switch 31 and 32 comprises a respective pair of electrical contacts 33 and 34, each pair being fixed on a flat element 25 thereby upwardly projecting therefrom. The electrical contacts 33 and 34 are preferably made of copper and the flat element 25, preferably made of elastic material, is coupled to the base 21 of the housing 20. Holes 26 are also formed in the base 21, preferably at each pair of electrical contacts 33 and 34, for the passage of a respective duct 27 for housing electrical wires (not shown) for connecting each pair of electrical contacts 33 and 34 to an electronic control unit 50 (see Figure 7), preferably positioned below deck, for electrical connection of the pushbutton panel 100 to a motor M (see Figure 7) for operating the nautical electro-mechanism to be controlled with the pushbutton panel 100. The electronic control unit 50 will be described in more detail below with reference to Figure 7.

[0027] The ducts 27 for the passage of the electrical wires of the push button switches 31 and 32 below deck extend from the flat element 25, on the opposite side from the side to which the pairs of electrical contacts 33 and 34 are fixed.

[0028] Each push button switch 31 and 32 further comprises a respective dome 35 and 36, made of water-resistant plastic material, for example rubber or silicone, arranged over the respective pair of electrical contacts 33 and 34. The domes 35 and 36 represent the collapsible part of each push button switch 31 and 32.

[0029] A respective closing/opening element of the electrical contacts 33 and 34 is provided inside each dome 35 and 36. In the embodiment illustrated in Figures 1 to 4, the closing/opening elements of the electrical contacts consist of metal washers 37 and 38, each fixed, for example fitted, at an upper inner surface of the respective dome 35 and 36. Each washer 37 and 38 thus has a free or uncovered surface 37a and 38a facing the respective electrical contacts 33 and 34 and suitably spaced therefrom by the dome shape of the respective dome 35 and 36. The distance between the free or uncovered surface 37a and 38a of the washer 37 and 38 and the respective electrical contacts 33 and 34 is further guaranteed by a return spring 39 and 40, which is interposed between the electrical contacts 33 and 34 and the respective washer 37 and 38. In particular, each return spring 37 and 38 contributes to ensuring that, in a rest or idle condition of the push button switches 31 and 32, the uncovered surface 37a and 38a of the washers is suitably spaced from the respective electrical contacts 33 and 34, so as to prevent unintentional operation of the respective push button switch 31 and 32.

[0030] The base 21 of the housing 20 is further provided with a partition 28, for separating the push button switches 31 and 32, which rises from the base 21, between the two push button switches. In particular, the partition 28 rises from a flat support 29, which is preferably arranged in the base 21, below the flat element 25 for supporting the electrical contacts 33 and 34, and extends between the two ducts 27 for housing electrical wires exiting from the electrical contacts 33 and 34. The partition 28 between the two push button switches 31 and 32 advantageously facilitates the user in operation of the desired push button switch. Preferably, the partition 28 is covered by a layer 41 of water-resistant plastic material, the same as the material of which the domes 35 and 36 are made, the layer 41 being connected to the domes at the flat element 25 for supporting the electrical contacts 33 and 34 of the push button switches 31 and 32. Preferably, the domes 35 and 36 and the covering layer 41 of the partition 28 of the push button switches 31 and 32 are integral, thereby acting as a water- and moisture-resistant sealing element for the respective electrical contacts 33 and 34.

[0031] A seat 42 is formed on top of the partition 28, in particular at the covering layer 41, if this is present, for snap fitting a tooth 22a projecting from an upper inner surface of the cover 22 of the housing 20. The snap fitting between the tooth 22a and the respective seat 42 advantageously allows the cover 22 to remain coupled to the base 21, in the closed condition of the housing 20.

[0032] With reference to Figures 5 and 6, these illus-

trate a pushbutton panel for controlling a nautical electro-mechanism according to an alternative embodiment of the present invention.

[0033] The pushbutton panel, indicated in general with the reference number 1100, differs from the pushbutton panel 100, described above and illustrated in Figures 1 to 4, in the different configuration of the push button switches, more particularly in the different positioning of the electrical contacts and of the respective washer for operating or closing the push button switch. The pushbutton panel 1100 therefore comprises a housing 120 and means 130 for electrically operating a nautical electro-mechanism, positioned within the housing 120.

[0034] The housing 120 comprises a base 121 and a cover 122 coupled on top of the base 121, preferably pivoted to the base by means of a hinge 123, and movable, with respect to the base 121, between a closed position of the housing 120 and an open position of the housing 120. The cover 122 preferably has a tab 124, projecting frontally from the cover 122, and which, when grasped by the user, facilitates opening and closing of the housing 120.

[0035] Preferably, the base 121 and the cover 122 of the housing 120 are made of stainless steel. The electrical operating means 130 comprise a first push button switch 131 and a second push button switch 132, each configured to operate the nautical electro-mechanism according to a respective direction of rotation.

[0036] Each push button switch 131 and 132 comprises a respective magnetic attraction electrical contact 133 and 134, which, instead of projecting upward from a flat element coupled to the base of the housing, as in the case of the pushbutton panel 100, is embedded into the flat element 125. In particular, each magnetic attraction electrical contact 133 and 134 consists of a pair of blades made of magnetic material.

[0037] Respective ducts 127 extend from the base 121, preferably at each magnetic attraction electrical contact 133 and 134, said ducts projecting downward from the flat element 125 and having the same function as the ducts 27 described previously with reference to the pushbutton panel 100. Each push button switch 131 and 132 further comprises a respective dome 135 and 136, made of water-resistant plastic material, for example rubber or silicone, arranged over the respective pair of magnetic attraction electrical contacts 133 and 134.

[0038] Moreover, a partition of the push button switches 131 and 132 is also provided in the base 121 of the housing 120, said partition being identical to the one described with reference to the pushbutton panel 100 described above with reference to Figures 1 to 4 and therefore it will not be further described.

[0039] A seat is formed on the top of the partition, for snap fitting a tooth 122a projecting from an upper inner surface of the cover 122 of the housing 120. Snap fitting between the tooth 122a and the respective seat advantageously allows the cover 122 to remain coupled to the base 121, in the closed condition of the housing 120.

[0040] A respective closing/opening element of the magnetic attraction electrical contact 133 and 134 is provided inside each dome 135 and 136. In the embodiment illustrated in Figures 5 and 6, the closing/opening elements of the magnetic attraction electrical contacts 133 and 134 consist of magnetic washers 137 and 138, in the form of permanent magnets. Each magnetic washer 137 and 138, instead of having a free or uncovered surface facing the respective electrical contacts, as in the case of the washers 37 and 38 of the pushbutton panel 100, is embedded into the respective dome 135 and 136.

[0041] Also in this embodiment, the distance between each magnetic washer 137 and 138, embedded into the respective dome 135 and 136, and the respective magnetic attraction electrical contacts 133 and 134, embedded into the flat element 125, is determined, besides by the dome shape of the dome, by a respective return spring 139 and 140, interposed between the respective magnetic attraction electrical contact 133 and 134 and the respective magnetic washer 137 and 138.

[0042] In particular, and as will be described in detail below, after the push button switch 131 and 132 is pressed, each magnetic washer 137 and 138 is moved in proximity to the respective magnetic attraction electrical contact 133 and 134, which is subjected to a magnetic field. Through the effect of the magnetic field, opposite polarities are generated in the blades of the contacts 133 and 134, thereby causing an attractive force that closes the blades against each other, thereby creating an electrical contact. When the influence of the external magnetic field ceases, i.e., when the magnetic washers 135 and 136 move away from the respective contact due to the effect of the return spring 139 and 140, the blades separate with consequent opening of the contact and return to the initial situation (at rest).

[0043] As the electrical contacts and the washers have no exposed surfaces, but are embedded into the domes and into the flat element, respectively, they are advantageously further protected from corrosion or oxidation that can occur, especially in a marine environment, and which could compromise the duration and the functionality of the push button switches.

[0044] With reference to Figure 7, this shows in detail the circuit diagram of the electronic control unit 50 of the pushbutton panel 100, 1100 according to the invention.

[0045] The electronic control unit 50 comprises a DC-DC converter 55, connected between an electrical power source 54 and the input of the first 31, 131 and of the second push button switches 32, 132. The DC-DC converter 55 allows the lowest voltage possible, preferably 12V DC, to be supplied in input to the pushbutton panel 100, 1100, regardless of the power supply voltage, which can vary from 10V to 48V DC. Advantageously, this avoids the presence of high currents in the electrical wires, thereby reducing the risk of fire in the event of a short circuit and simultaneously allowing the use of electrical wires with a small cross section, with evident savings both in terms of space and cost.

[0046] The output of the first push button switch 31, 131 is connected to the input of a first relay 51 and the output of the second push button switch 32, 132 is connected to the input of a second relay 52. Each relay 51 and 52 is connected to the electrical power source 54 and to the motor M for operating the nautical electro-mechanism to be controlled with the pushbutton panel 100, 1100.

[0047] More in particular, the first and second relays 51 and 52 comprise a respective electromagnet 56 and 57, consisting of a coil of conductive wire, generally made of copper, wound around a ferromagnetic core, and a movable contact 58 and 59 operated by the electromagnet 56 and 57. The first and second relays 51 and 52 are electrically connected to each other so that no short circuit is generated in the case in which the user unintentionally presses both push button switches 31, 131 and 32, 132 or owing to a fault in the pushbutton panel. The relays 51 and 52 are also electrically connected to each other and so that, in rest conditions, the electromagnets 56 and 57 and the motor M are at the lowest electric potential. This is in order to reduce as much as possible the effects of corrosion due to galvanic currents that can generate in a humid or saline environment such as the marine environment. Moreover, as the motor M is at the lowest electric potential, in the event of the nautical electro-mechanism remaining unused at length, any infiltration of water into the motor M would not cause a short circuit.

[0048] It will now be described the operation of the pushbutton panel according to the present invention.

[0049] Let us assume, by way of an example, that a user wishes to use the pushbutton panel 100, 1100 described above to control a motorized winch installed on a craft in order to tension a rope or line.

[0050] Firstly, the user lifts the closing cover 22, 122 in order to access the push button switches 31, 131 and 32, 132 and presses the first push button switch 31, 131 with the foot, so as to rotate the motorized winch in a first direction of rotation.

[0051] After pressure is exerted, and with particular reference to the pushbutton panel 100, the silicone dome 35 of the first push button switch 31 collapses and the return spring 39 is compressed until the uncovered surface 37a of the metallic washer 37 fixed in the dome abuts against the electrical contacts 33 projecting from the flat element 25, closing the switch.

[0052] Instead, in the case of the pushbutton panel 1100, after pressure is exerted, the silicone dome 135 of the first push button switch 131 collapses and the return spring 139 is compressed until the magnetic washer 137 embedded into the dome is moved in proximity to the magnetic attraction electrical contact 133 embedded into the flat element 125, thus causing attraction of the blades and consequent closing of the switch.

[0053] In particular, when each magnetic washer 137 and 138 is in proximity to the respective magnetic attraction electrical contact 133 and 134, the latter is subjected

to a magnetic field. Due to the effect of the magnetic field, opposite polarities are generated in the blades of the contacts 133 and 134, thus causing an attractive force that closes the blades against each other, thereby creating the electrical contact. When the influence of the external magnetic field ceases, i.e., when the magnetic washers 135 and 136 move away from the respective contact due to the effect of the return spring 139 and 140, the blades separate with consequent opening of the contact, thus restoring the initial situation (rest condition).

[0054] Closing of the first push button switch 31, 131 causes the passage of electric current inside the coil of the electromagnet 56 and consequent closing of the movable contact 58. Closing of the movable contact 58 of the first relay 51 in turn causes power to be supplied to the motor M, with consequent rotation of the winch in the first direction of rotation, for tensioning the rope or line.

[0055] When the user lifts the foot off the first push button switch 31, 131, due to the effect of the return action of the spring 39, the washer 37 separates from the electrical contacts 33, and the magnetic washer 137 moves away from the magnetic contact 133, consequently causing the magnetic field to cease and the blades to separate. The switch opens, thereby interrupting rotation of the motorized winch in the first direction of rotation.

[0056] Let us assume now that the user, again using the pushbutton panel 100, 1100, wishes to operate the motorized winch in order to slacken the rope or line.

[0057] Also in this case, the user lifts the closing cover 22, 122 in order to access the push button switches 31, 131 and 32, 132 and presses the second push button switch 32, 132 with the foot, so as to rotate the motorized winch in a second direction of rotation, opposite to the first.

[0058] After pressure is exerted, and with particular reference to the pushbutton panel 100, the silicone dome 36 of the second push button switch 32 collapses and the return spring 40 is compressed until the uncovered surface 38a of the metallic washer 38 fixed in the dome abuts against the electrical contacts 34 projecting from the flat element 25, closing the switch.

[0059] Instead, in the case of the pushbutton panel 1100, after pressure is exerted, the silicone dome 136 of the second push button switch 132 collapses and the return spring 140 is compressed until the magnetic washer 138 embedded into the dome is moved in proximity to the magnetic attraction electrical contact 134 embedded into the flat element 125, causing mutual attraction of the blades due to the effect of the magnetic field generated, thereby closing the switch. Closing of the second push button switch 32, 132 causes the passage of electrical current inside the coil of the electromagnet 57 and consequent closing of the movable contact 59. Closing of the movable contact 59 of the second relay 52 in turn causes power to be supplied to the motor M, with consequent rotation of the winch in the second direction of rotation and slackening of the rope or line.

[0060] When the user lifts the foot off second push but-

ton switch 32, 132, due to the effect of the return action of the spring 40, the washer 38 separates from the electrical contacts 34 - in the case of the pushbutton panel 100 - and the magnetic washer 138 moves away from the magnetic contact 134 - in the case of the pushbutton panel 1100 - opening the push button switch and thereby interrupting rotation of the motorized winch in the second direction of rotation.

[0061] If the user unintentionally presses both the push button switches 31, 131 and 32, 132 simultaneously, the power supply to the relays 51 and 52 is interrupted, preventing a short circuit. The pushbutton panel thus obtained is consequently provided with intrinsic self-protection. In particular, the simultaneous activation of both the push button switches 31, 131 and 32, 132 determines an idle condition of the pushbutton panel 100, 1100 such that the simultaneous activation of both the push button switches is equivalent to no activation thereof. The features of the pushbutton panel of the present invention and the related advantages are evident from the foregoing description.

[0062] Finally, it is clear that the pushbutton panel thus conceived is susceptible to numerous modifications and variants; moreover, all details can be replaced by technically equivalent elements.

Claims

1. Pushbutton panel (100; 1100) for controlling a nautical electro-mechanism comprising a housing (20; 120), an electronic control unit (50) for electrical connection to the nautical electro-mechanism to be controlled, and means (30; 130) for operating the nautical electro-mechanism positioned within the housing (20; 120) and in electrical communication with the electronic control unit (50),
characterized in that said operating means (30; 130) comprise a first (31; 131) and a second push button switch (32; 132), each configured to operate the nautical electro-mechanism according to a respective direction of rotation and **in that** the housing (20; 120) comprises a base (21; 121), from which a partition (28) for separating the first (31; 131) and the second push button switch (32; 132) rises.
2. Pushbutton panel (100; 1100) according to claim 1, wherein the first (31; 131) and second push button switches (32; 132) are housed within a respective dome (35, 36; 135, 136) movable between an open and a closed position of the respective push button switch (31, 32; 131, 132).
3. Pushbutton panel (100) according to claim 2, wherein the first (31) and second push button switches (32) comprise a respective pair of electrical contacts (33, 34), each being fixed on a flat element (25) thereby upwardly projecting therefrom, and a closing/open-

ing element (37, 38) of the electrical contacts (33, 34), which is associated with an upper inner surface of the respective dome (35, 36), each closing/opening element (37, 38) of the electrical contacts (33, 34) presenting a free surface (37a, 38a) facing the
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respective electrical contacts (33, 34) and suitably spaced therefrom.

4. Pushbutton panel (1100) according to claim 2, wherein the first (131) and second push button switches (132) comprise a respective magnetic attraction electrical contact (133, 134), embedded into a flat element (125), and a magnetic closing/opening element (137, 138) of the electrical contact (133, 134), embedded into an upper inner surface of the
10
respective dome (135, 136) to face the respective electrical contact (133, 134) and be suitably spaced therefrom. 15
5. Pushbutton panel (100; 1100) according to claim 3 or 4, wherein the first (31; 131) and second push button switches (32; 132) comprise a return spring (39, 40; 139 140), which is interposed between the
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respective pair of electrical contacts (33, 34) or the respective magnetic attraction electrical contact (133, 134) and the respective closing/opening element (37, 38; 137, 138) of the electrical contact(s)
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(33, 34; 133, 134).
6. Pushbutton panel (100; 1100) according to any one of the preceding claims, wherein the housing (20; 120) comprises a cover (22; 122) movable with respect to the base (21; 121) between a closed condition and an open condition of the housing (20; 120).
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7. Pushbutton panel (100; 1100) according to any one of the preceding claims, wherein the partition (28) has an upper seat (42) for snap fitting a respective tooth (22a; 122a) projecting from an upper inner surface of the cover (22; 122) of the housing (20; 120).
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8. Push-button panel (100; 1100) according to any one of claims 2 to 7, wherein each dome (35, 36; 135 136) is made of water-resistant plastic material, for example rubber or silicone, and the partition (28) comprises a layer (41; 141) of water-resistant plastic material, the domes (35, 36; 135 136) and the layer (41; 141) being integral. 45
9. Push-button panel (100; 1100) according to any one of the preceding claims, wherein the electronic control unit (50) comprises a DC-DC converter (55), electrically connected between an electrical power source (54) and the input of the first (31; 131) and second push button switches (32; 132).
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55
10. Push-button panel (100; 1100) according to any one of the preceding claims, wherein the electronic con-

trol unit (50) further comprises a first relay (51) and a second relay (52), the first relay being electrically connected between an output of the first push button switch (31; 131) and a motor (M) for driving the nautical electro-mechanism to be controlled, the second relay (52) being electrically connected between an output of the second push button switch (32; 132) and the motor (M).

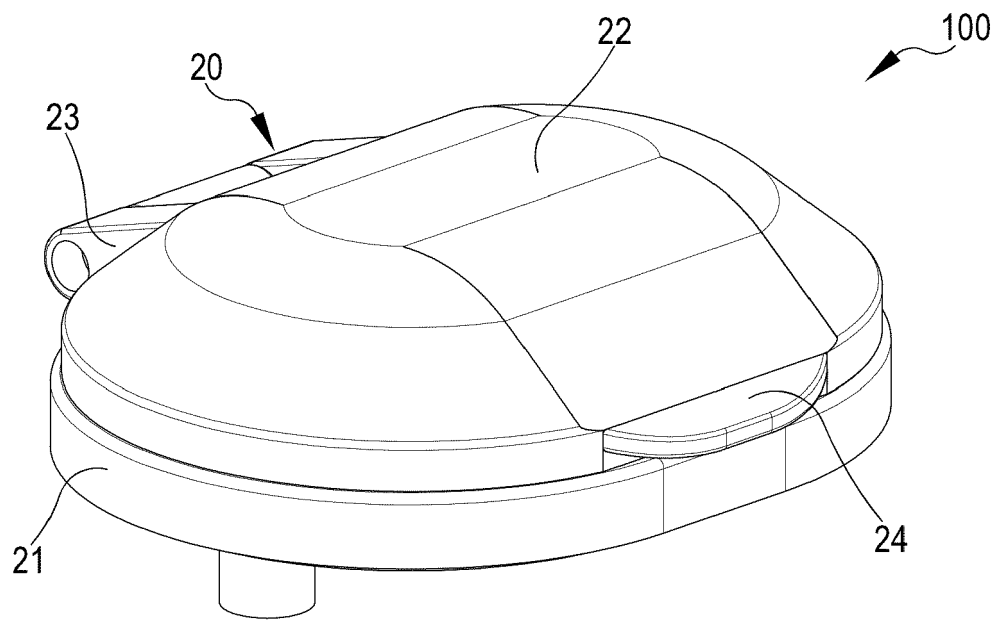


FIG.1

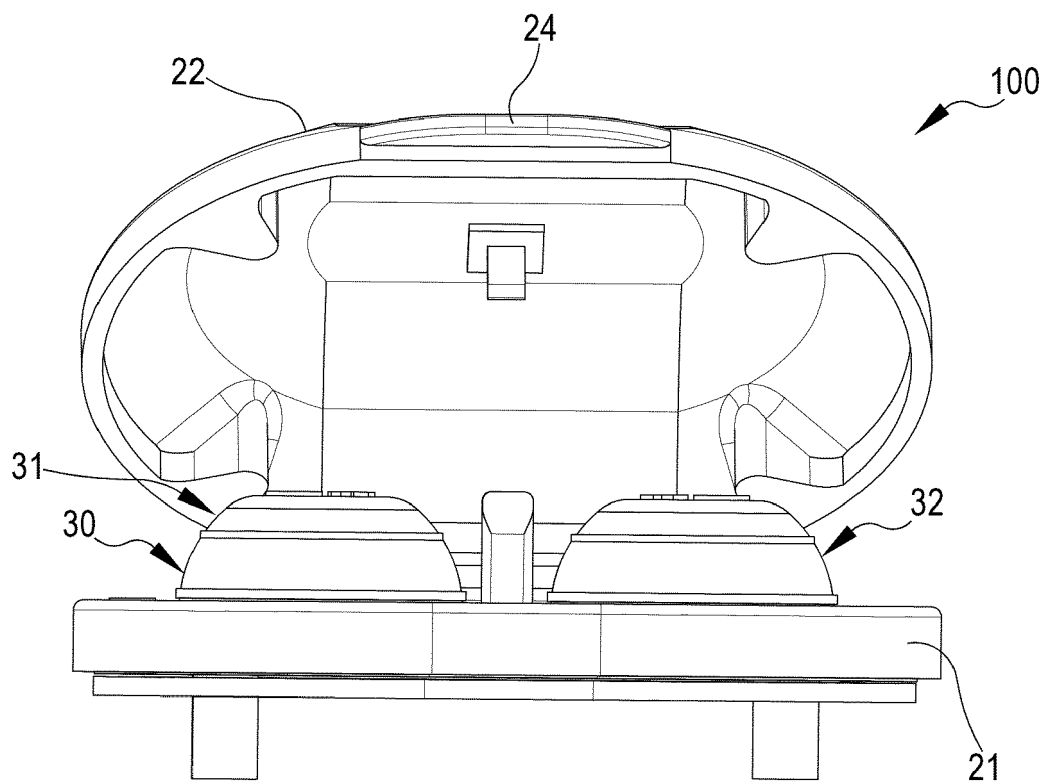


FIG.2

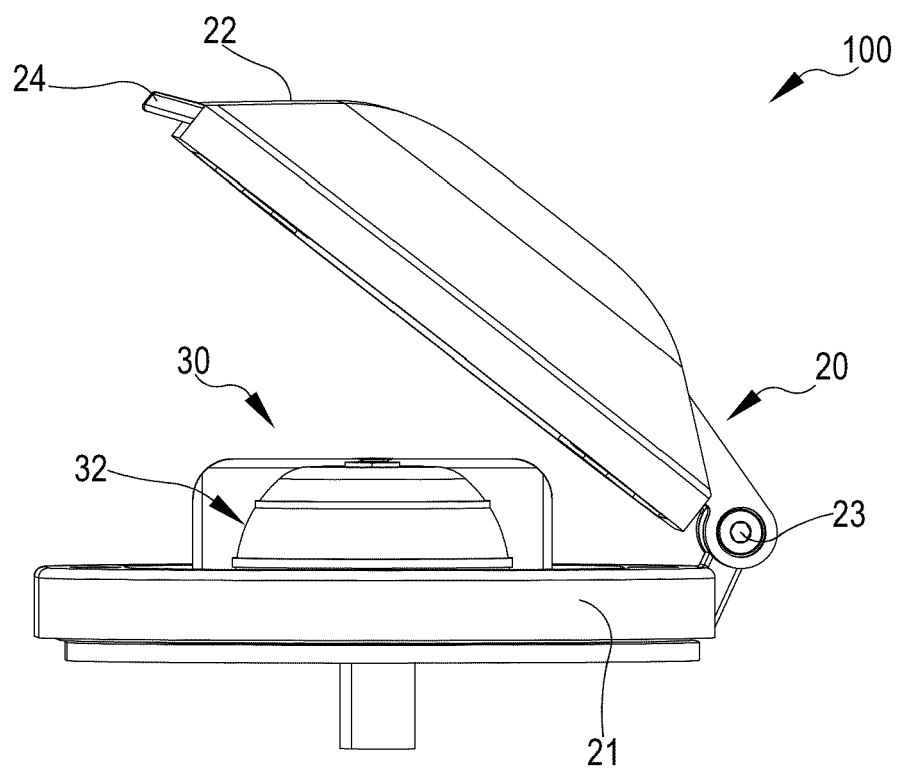


FIG. 3

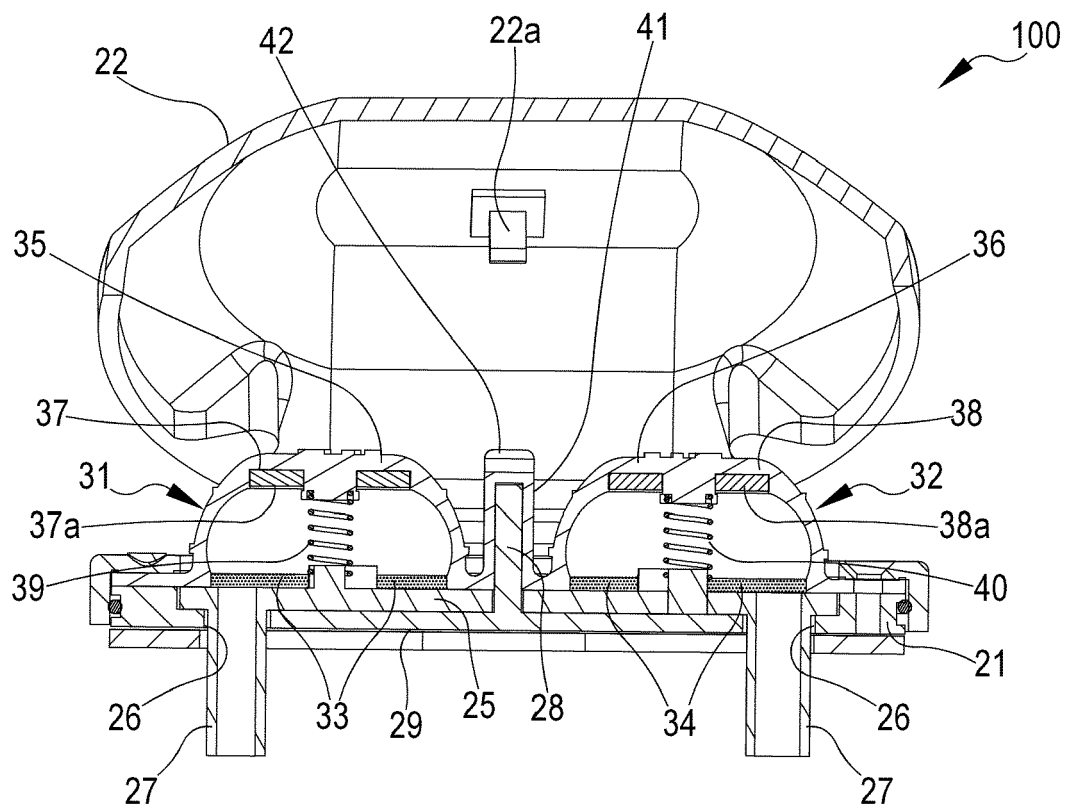


FIG. 4

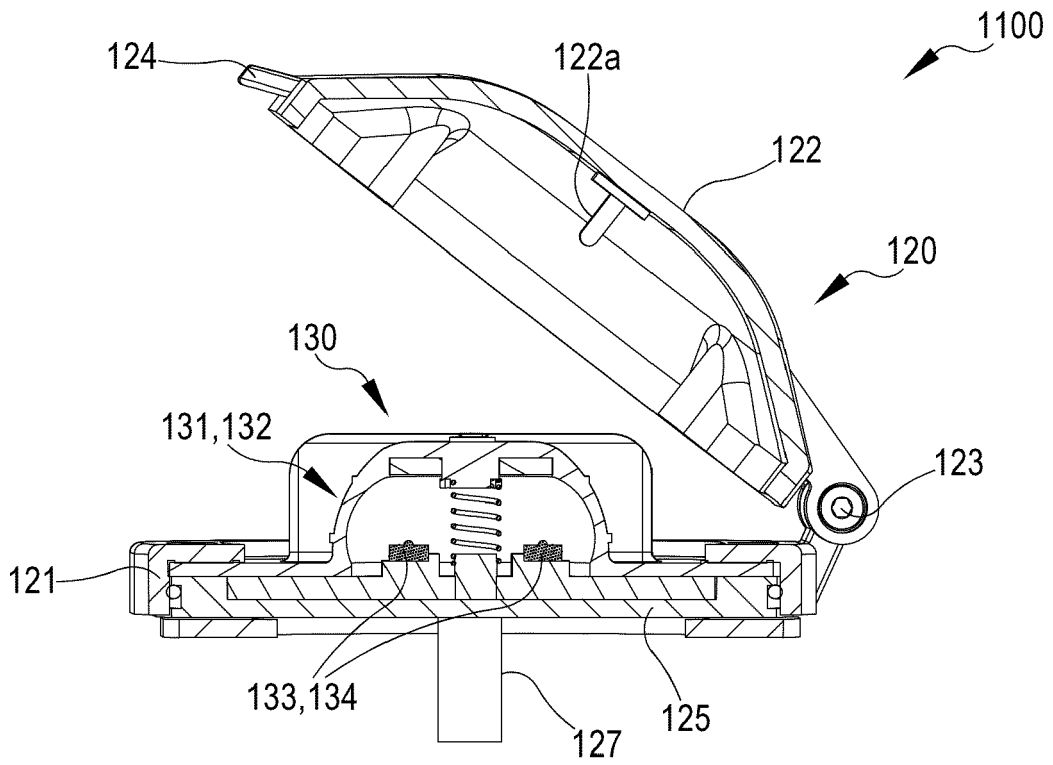


FIG. 5

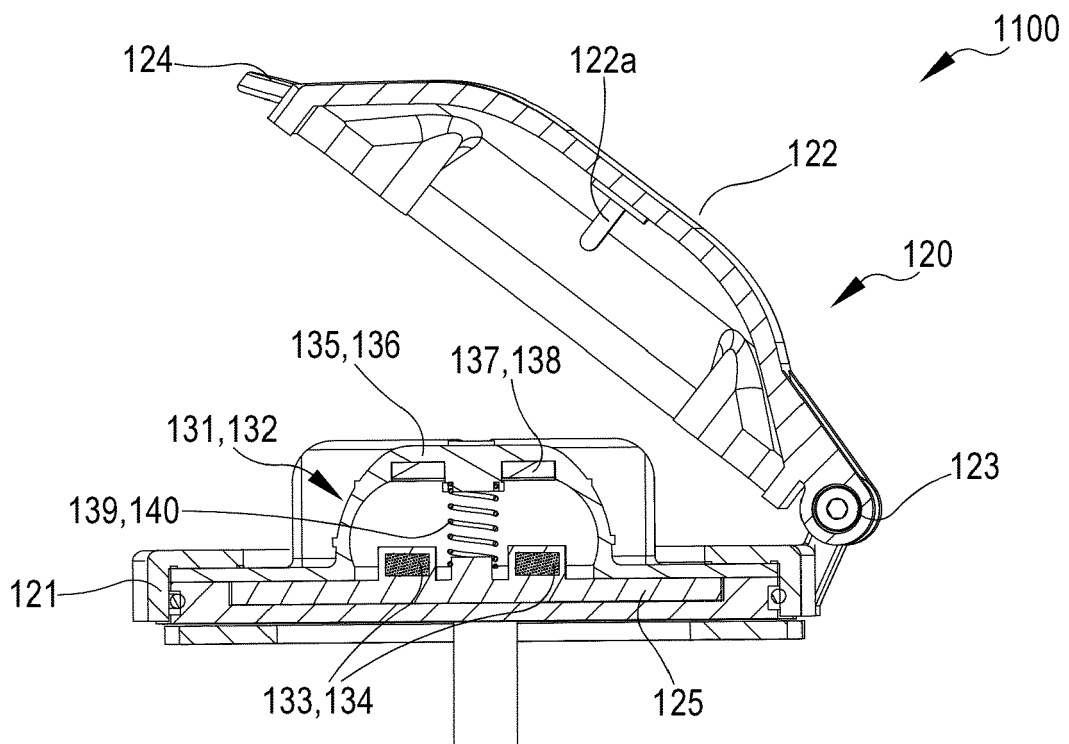


FIG. 6

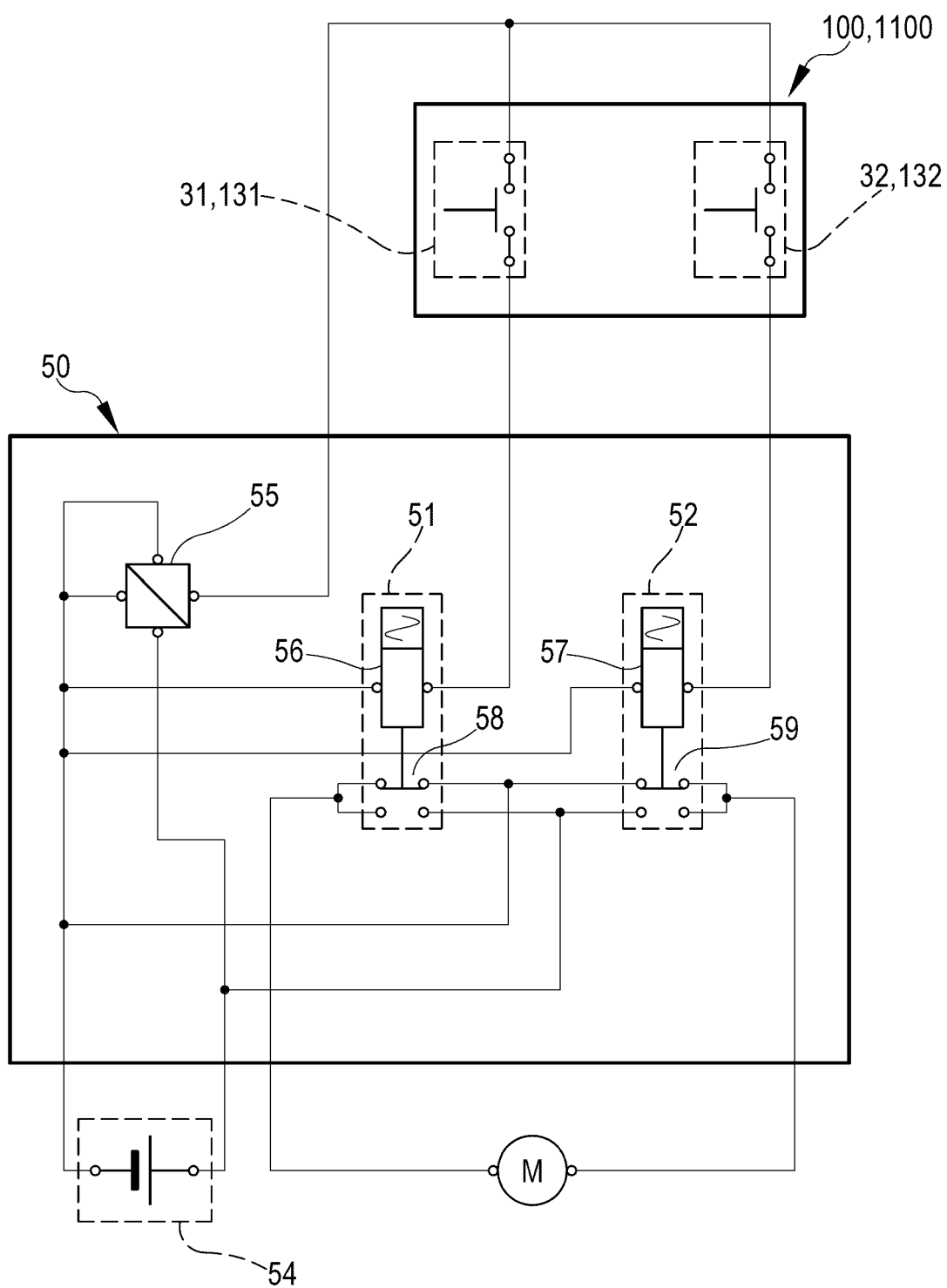


FIG.7



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Place of search Munich		Date of completion of the search 9 March 2022	Examiner Pavlov, Valeri
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