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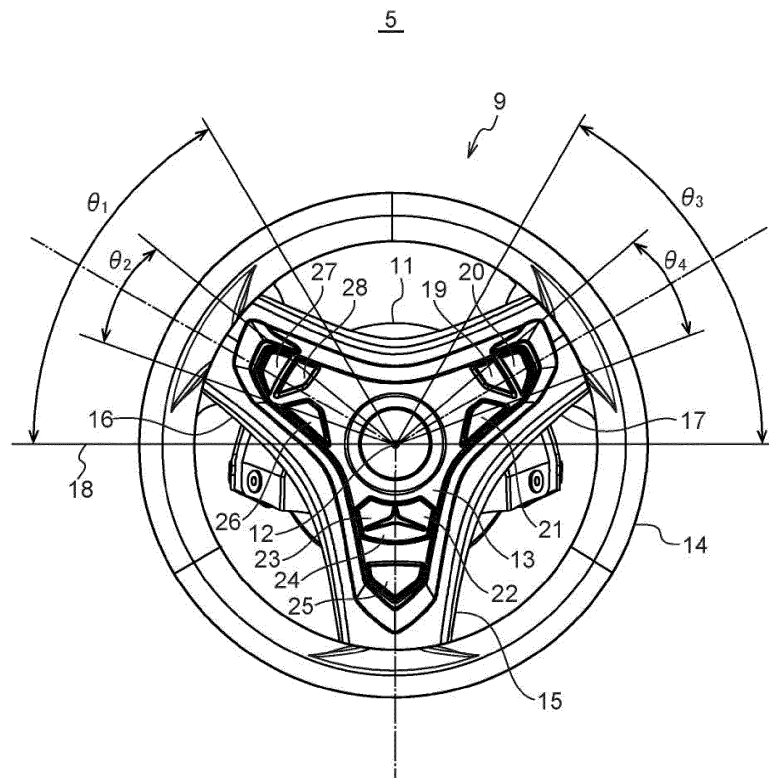
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(54) **STEERING MECHANISM FOR MARINE VESSEL, AND MARINE VESSEL**

(57) A marine vessel that is able to not only improve the flexibility in the layout of switches but also improve the operability of the switches is provided. The marine vessel includes a marine vessel steering mechanism.

The marine vessel steering mechanism includes a steering wheel, and the steering wheel includes switches related to starting and stopping of a power source of the marine vessel.

FIG. 3



Description

[0001] The present invention relates to a steering mechanism for a marine vessel, and a marine vessel equipped with the same.

[0002] A marine vessel includes an ignition switch to start and stop a supply of electric power to engine(s), a start/stop switch to start and stop the engine(s) according to an operation, and an engine shutoff switch to emergency-stop the engine(s). In addition, since these switches are operated during maneuvering of the marine vessel, they are usually located on a panel of a maneuvering seat. For example, as shown in FIG. 8, a main switch 82 also serving both as the ignition switch and the start/stop switch, an engine shutoff switch 83, a remote control switch 6, a joystick 7, and a multi-function display (MFD) 8 are located on a panel 81 of a maneuvering seat 80 (for example, see JP 2020-101125 A). A steering wheel 9 is also located on the maneuvering seat 80.

[0003] Therefore, there is room for improvement in terms of flexibility in the layout of the switches, such as the panel 81 having no sufficient space and difficulty in arranging other switches.

[0004] In addition, a marine vessel operator usually grips the steering wheel 9, but since the steering wheel 9 is separated from the panel 81 of the maneuvering seat 80, in order to operate the main switch 82 and the like located on the panel 81 of the maneuvering seat 80, the marine vessel operator needs to extend his/her hands, and in some cases, it is necessary to lean his/her body toward the panel 81. Therefore, there is room for improvement also from the viewpoint of the operability of the switches.

[0005] It is the object of the present invention to provide a marine vessel steering mechanism for marine vessels and a marine vessel that are each able to not only improve the flexibility in the layout of switches but also improve the operability of the switches.

[0006] According to the present invention said object is solved by a marine vessel steering mechanism having the features of independent claim 1. Moreover, said object is solved by a marine vessel according to claim 12. Preferred embodiments are laid down in the dependent claims.

[0007] According to a preferred embodiment, a marine vessel includes a marine vessel steering mechanism. The marine vessel steering mechanism includes a steering wheel, and the steering wheel includes switches related to starting and stopping of a power source of the marine vessel.

[0008] According to another preferred embodiment, a marine vessel includes a marine vessel steering mechanism. The marine vessel steering mechanism includes switches related to starting and stopping of a power source of the marine vessel.

[0009] According to another preferred embodiment, a marine vessel steering mechanism includes a steering wheel. The steering wheel includes switches related to

starting and stopping of a power source of a marine vessel.

[0010] According to the preferred embodiments, since the steering wheel of the steering mechanism for the marine vessel includes the switches related to starting and stopping of the power source of the marine vessel, it is no longer necessary to arrange the switches related to starting and stopping of the power source of the marine vessel on a panel of a maneuvering seat. As a result, it becomes easy to arrange other switches on the panel of a maneuvering seat, and it is possible to improve the flexibility in the layout of the switches. In addition, since the marine vessel operator is able to operate the switches related to starting and stopping of the power source of the marine vessel without taking his/her hands off the steering wheel, it is no longer necessary to extend his/her hands for the operation, and it is also possible to improve the operability of the switches related to starting and stopping of the power source of the marine vessel. As a result, it is possible to not only improve the flexibility in the layout of the switches but also improve the operability of the switches.

[0011] The above and other elements, features, steps, characteristics and advantages of the present invention will become more apparent from the following detailed description of the preferred embodiments with reference to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

FIG. 1 is a perspective view of a marine vessel equipped with a steering mechanism for a marine vessel according to a preferred embodiment.

FIG. 2 is a perspective view of a principal portion of a maneuvering seat in the preferred embodiment.

FIG. 3 is a view for explaining a configuration of the steering mechanism for the marine vessel.

FIG. 4 is a view for explaining the configuration of the steering mechanism for the marine vessel.

FIG. 5 is a block diagram for schematically explaining a configuration of a marine vessel maneuvering system of the marine vessel of FIG. 1.

FIG. 6 is a view for explaining a configuration of a modified example of the steering mechanism for the marine vessel.

FIG. 7 is a block diagram for schematically explaining a configuration of a modified example of the marine vessel maneuvering system of the marine vessel of FIG. 1.

FIG. 8 is a perspective view of a principal portion of a conventional maneuvering seat.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] Hereinafter, preferred embodiments will be de-

scribed with reference to the drawings.

[0014] FIG. 1 is a perspective view of a marine vessel equipped with a steering mechanism for a marine vessel according to a preferred embodiment. A marine vessel 1 includes a hull 2, and a plurality of, for example, two outboard motors 3 that function as marine vessel propulsion devices and are mounted on the hull 2. It should be noted that the number of the outboard motors 3 provided on the marine vessel 1 is not limited to two, and may be one or three or more. The two outboard motors 3 are mounted side by side on the stern of the hull 2. Each outboard motor 3 includes an engine (not shown) which may be an internal combustion engine functioning as a power source, and obtains a thrust from a propeller (not shown) which is rotated by a driving force of the corresponding engine. It should be noted that each outboard motor 3 may include an electric motor functioning as the power source, or may include both an engine and an electric motor functioning as the power source.

[0015] In addition, in the marine vessel 1, a maneuvering seat 4 is provided on the bow side, which is the front portion of the hull 2. FIG. 2 is a perspective view of a principal portion of the maneuvering seat 4. A steering mechanism 5 for a marine vessel (hereinafter, also simply referred to as "a marine vessel steering mechanism 5"), a remote control switch 6, a joystick 7, and an MFD 8 are located on the maneuvering seat 4.

[0016] The marine vessel steering mechanism 5 is a device that enables a marine vessel operator to determine the course of the marine vessel 1. The marine vessel steering mechanism 5 includes a steering wheel 9 which is rotatably operable. The marine vessel operator is able to turn the marine vessel 1 left or right by rotatably operating the steering wheel 9 left or right. The remote control switch 6 includes levers 10 corresponding to the outboard motors 3, respectively. By operating each lever 10, the marine vessel operator is able to switch a direction of the thrust generated by the corresponding outboard motor 3 between a forward moving direction and a backward moving direction, and adjust the output of the corresponding outboard motor 3 so as to adjust a vessel speed of the marine vessel 1.

[0017] The joystick 7 is operable to be tilted forward, backward, leftward and rightward, and is also operable to rotate about an axis. By operating the joystick 7, the marine vessel operator is able to navigate the marine vessel 1 with a course corresponding to a tilting direction of the joystick 7 and a thrust corresponding to a tilting amount of the joystick 7. In a normal mode, the outboard motor 3 works mainly according to an operation of the marine vessel steering mechanism 5 and an operation of the remote control switch 6. On the other hand, in a joystick mode, the outboard motor 3 works mainly according to an operation of the joystick 7. It is possible to switch between the normal mode and the joystick mode by a change-over switch (not shown).

[0018] The MFD 8 is, for example, a color LCD display. The MFD 8 functions as a display that displays various

kinds of information, and also functions as a touch panel that accepts inputs from the marine vessel operator. For example, the MFD 8 displays a rotation speed of the engine of each outboard motor 3 and the vessel speed of the marine vessel 1.

[0019] FIG. 3 and FIG. 4 are views for explaining a configuration of the marine vessel steering mechanism 5. FIG. 3 shows a case that the marine vessel steering mechanism 5 is viewed right opposite from the side of the marine vessel operator, and FIG. 4 shows a case that the marine vessel steering mechanism 5 is obliquely viewed from the opposite side of the marine vessel operator. It should be noted that a vertical direction and a left/right direction of FIG. 3 correspond to the vertical direction and the left/right direction of the marine vessel 1, the depth side of FIG. 3 is the bow side of the marine vessel 1, and the front side of FIG. 3 is the stern side of the marine vessel 1.

[0020] As shown in FIG. 3 and FIG. 4, the marine vessel steering mechanism 5 includes the steering wheel 9, and a column portion 11 that pivotally and rotatably supports the steering wheel 9. The steering wheel 9 includes a central portion 13 that is supported rotatably around a rotation fulcrum (a steering shaft) 12 with respect to the column portion 11, a wheel portion 14 that has an annular shape, and, for example, three spoke portions (spoke portions 15, 16, and 17) that connect the central portion 13 and the wheel portion 14. The steering wheel 9 is provided on the stern side of the column portion 11. It should be noted that as shown in FIG. 4 and FIG. 6 described below, the column portion 11 is configured by a rotating portion 11a that rotates together with the steering wheel 9 and a non-rotating portion 11b that does not rotate.

[0021] When the steering wheel 9 is at a position that makes the marine vessel 1 move straight, the spoke portion 15 is positioned below a virtual plane 18 passing through the rotation fulcrum 12 and parallel to the left/right direction, and extends downward from the rotation fulcrum 12.

[0022] Further, when the steering wheel 9 is at the position that makes the marine vessel 1 move straight, the spoke portion 16 is positioned above the virtual plane 18, and extends from the rotation fulcrum 12 so as to be positioned within an angle range from about 0° to about 60°, for example, clockwise with respect to the virtual plane 18 in a circumferential direction about the rotation fulcrum 12 (within an angle range indicated by $\theta 1$ in FIG. 3), preferably, so as to be positioned within an angle range from about 20° to about 40°, for example, clockwise with respect to the virtual plane 18 in the circumferential direction about the rotation fulcrum 12 (within an angle range indicated by $\theta 2$ in FIG. 3).

[0023] Furthermore, when the steering wheel 9 is at the position that makes the marine vessel 1 move straight, the spoke portion 17 is positioned above the virtual plane 18, and extends from the rotation fulcrum 12 so as to be positioned within an angle range from

about 0° to about 60°, for example, counterclockwise with respect to the virtual plane 18 in the circumferential direction about the rotation fulcrum 12 (within an angle range indicated by $\theta 3$ in FIG. 3), preferably, so as to be positioned within an angle range from about 20° to about 40°, for example, counterclockwise with respect to the virtual plane 18 in the circumferential direction about the rotation fulcrum 12 (within an angle range indicated by $\theta 4$ in FIG. 3).

[0024] In the preferred embodiment, as shown in FIG. 3, an ignition switch 19 and a start/stop switch 20 are located on the steering wheel 9. The ignition switch 19 is a switch to start and stop a supply of electric power to the engine of each outboard motor 3, and the start/stop switch 20 is a switch to start and stop the engine of each outboard motor 3 according to the operation.

[0025] For example, the ignition switch 19 and the start/stop switch 20 are located on the spoke portion 17 of the steering wheel 9. In particular, it is preferable that the start/stop switch 20 is located within a range that fingers of the marine vessel operator who is gripping the wheel portion 14, for example, thumbs of the marine vessel operator who is gripping the wheel portion 14, are able to reach.

[0026] When the marine vessel 1 is navigating, sometimes the marine vessel operator grips the wheel portion 14 while standing, at that time, since the marine vessel operator holds the wheel portion 14 from above, the marine vessel operator grips the upper half of the wheel portion 14, particularly grips the vicinity where the wheel portion 14 intersects the spoke portions 16 and 17. Therefore, in the case that the start/stop switch 20 is located within the range of the spoke portion 17 that the thumbs of the marine vessel operator who is gripping the wheel portion 14 are able to reach, the marine vessel operator is able to operate the start/stop switch 20 with his/her thumbs without regripping the wheel portion 14. As a result, for example, when the marine vessel operator starts or stops the engine of each outboard motor 3 in order to allow a passenger to ride a wakeboard, the marine vessel operator does not need to take his/her hands off the wheel portion 14.

[0027] Further, it is preferable that the start/stop switch 20 and the ignition switch 19 are located adjacent to each other. As a result, the marine vessel operator is able to continuously operate the ignition switch 19 and the start/stop switch 20 to start the supply of the electric power to the engine of each outboard motor 3 and then immediately start the engine of each outboard motor 3.

[0028] It should be noted that the place where the ignition switch 19 and the start/stop switch 20 are located is not limited to the spoke portion 17, and may be the central portion 13, the spoke portion 15, or the spoke portion 16. Specifically, the ignition switch 19 and the start/stop switch 20 may be located on any one of switches 21 to 28 shown in FIG. 3, respectively. It should be noted that the ignition switch 19 and the start/stop switch 20 may not be located adjacent to each other. Moreover,

the ignition switch 19 and the start/stop switch 20 may be located not only on the surfaces of the spoke portions 15, 16, and 17 but also on the sides thereof.

[0029] Furthermore, in addition to the ignition switch 19 and the start/stop switch 20, a battery switch may be located on any one of the switches 21 to 28 of the steering wheel 9. Since the battery switch is a switch to switch whether or not the electric power is supplied from a battery of the marine vessel 1 to the electrical system of the marine vessel 1 when the marine vessel 1 is moored or landed and does not work for a while and is not used so frequently, the battery switch may be located on a place where the marine vessel operator needs to take his/her hands off the wheel portion 14 for operation, for example, may be located on the spoke portion 15.

[0030] Moreover, in the preferred embodiment, as shown in FIG. 4, an engine shutoff switch 29 is located on the non-rotating portion 11b of the column portion 11. The engine shutoff switch 29 is a switch to emergency-stop the engine of each outboard motor 3. For example, in the preferred embodiment, the engine shutoff switch 29 includes a push switch, and works (is activated) by cooperation between a lanyard 30 and the push switch. Here, a working mechanism (an activation mechanism) of the engine shutoff switch 29 will be described. In the engine shutoff switch 29, in the case that a hook at the tip of the lanyard 30 as a rope attached to the body of the marine vessel operator, for example, the ankle of the marine vessel operator, is interposed between the column portion 11 and the push switch biased toward the column portion 11, when the marine vessel operator falls into the water from the marine vessel 1, the hook pulled by the lanyard 30 is released from the push switch, the push switch moves toward the column portion 11 and works (is activated), and the engine of each outboard motor 3 is emergency-stopped. Moreover, since the engine shutoff switch 29 is located on the non-rotating portion 11b, the lanyard 30 will not be pulled even when the steering wheel 9 is rotated, and it is possible to prevent the engine shutoff switch 29 from working (being activated) unintentionally due to the operation of the steering wheel 9 when the marine vessel operator navigates the marine vessel 1.

[0031] On the column portion 11, the engine shutoff switch 29 is positioned below the virtual plane 18. As a result, it is possible to easily connect the engine shutoff switch 29 and the ankle of the marine vessel operator by using the lanyard 30, and it is possible to assist smooth working (activation) of the engine shutoff switch 29.

[0032] FIG. 5 is a block diagram for schematically explaining a configuration of a marine vessel maneuvering system of the marine vessel 1. As shown in FIG. 5, in addition to the outboard motors 3, the marine vessel steering mechanism 5, the remote control switch 6, the joystick 7, the MFD 8, the ignition switch 19, the start/stop switch 20, and the engine shutoff switch 29 that are described above, the marine vessel maneuvering system of the marine vessel 1 includes a global positioning sys-

tem (GPS) 31, a heading sensor (HS) 32, a remote control ECU (Engine Control Unit) 33 functioning as a controller, steering control units (SCUs) 34, and a steering shaft sensor 35. It should be noted that the steering shaft sensor 35 is located on the column portion 11 together with the engine shutoff switch 29. As described above, the ignition switch 19 and the start/stop switch 20 are located on the steering wheel 9 of the marine vessel steering mechanism 5.

[0033] The GPS 31 obtains the current position of the marine vessel 1 and transmits the current position of the marine vessel 1 to the remote control ECU 33 as position information. The HS 32 incorporates direction sensors (azimuth sensors) such as a yaw sensor, a roll sensor, and a pitch sensor, an acceleration sensor that measures an acceleration of the marine vessel 1 in a front-rear direction (a longitudinal direction), an acceleration sensor that measures an acceleration of the marine vessel 1 in a left/right direction, and an acceleration sensor that measures an acceleration of the marine vessel 1 in a vertical direction. The HS 32 transmits a direction of the marine vessel 1 and the respective accelerations (movement) of the marine vessel 1 to the remote control ECU 33.

[0034] The remote control ECU 33 is a main controller of the marine vessel maneuvering system, and controls operations of respective components of the marine vessel maneuvering system according to digital signals that will be described below, and various kinds of programs. In addition, the remote control ECU 33 controls the engine of each outboard motor 3 according to the operation of each lever 10 of the remote control switch 6. The SCU 34 is provided corresponding to each outboard motor 3, and controls a steering unit (a steering mechanism) that horizontally turns the corresponding outboard motor 3 with respect to the hull 2 of the marine vessel 1 so as to change an acting direction of the thrust of each outboard motor 3. The steering shaft sensor 35 detects a rotation angle (an operation angle) of the steering wheel 9 of the marine vessel steering mechanism 5.

[0035] In the marine vessel maneuvering system, the respective components are connected to each other by a control area network (CAN) 36 that is a network in which a plurality of nodes are individually connected to a bus. In the CAN 36, operation inputs to the respective components are transmitted as the digital signals to the remote control ECU 33 via the bus.

[0036] In addition, in the marine vessel maneuvering system, the remote control switch 6 is connected to the remote control ECU 33 not only by the CAN 36 but also by individual wiring (see a broken line in FIG. 5). The operation input to each lever 10 of the remote control switch 6 is transmitted also as an analog signal to the remote control ECU 33. Further, the engine shutoff switch 29 is connected to the remote control ECU 33 only by individual wiring (see a broken line in FIG. 5), and working (activation) of the engine shutoff switch 29 is transmitted to the remote control ECU 33 as an analog signal. More-

over, the ignition switch 19 and the start/stop switch 20 of the marine vessel steering mechanism 5 are connected to the remote control ECU 33 not only by the CAN 36 but also by individual wiring (see a broken line in FIG. 5).

The operation input to the ignition switch 19 and the operation input to the start/stop switch 20 are also transmitted to the remote control ECU 33 as analog signals.

[0037] It should be noted that in the marine vessel maneuvering system, the respective components may be connected to each other not by the CAN but by a local area network (LAN) such as Ethernet (registered trademark) that performs connecting via a network device, or the respective components may be directly connected to each other. Also in this case, the operation inputs to the respective components are transmitted as the digital signals to the remote control ECU 33.

[0038] When the ignition switch 19 is operated, the operation input to the ignition switch 19 is transmitted as the analog signal to the remote control ECU 33, and the remote control ECU 33 performs starting or stopping the supply of the electric power to the engine of each outboard motor 3 according to the operation input to the ignition switch 19. Furthermore, when the start/stop switch 20 is operated, the operation input to the start/stop switch 20 is transmitted as the analog signal to the remote control ECU 33, and the remote control ECU 33 transmits a control signal to an ECU (not shown) of each outboard motor 3 according to the operation input to the start/stop switch 20 to start or stop the engine of each outboard motor 3. Moreover, when the engine shutoff switch 29 works (is activated), the working (activation) of the engine shutoff switch 29 is transmitted as the analog signal to the remote control ECU 33, and the remote control ECU 33 emergency-stops the engine of each outboard motor 3.

[0039] According to the preferred embodiment, the ignition switch 19 and the start/stop switch 20 are located on the spoke portion 17 of the steering wheel 9. As a result, since the marine vessel operator is able to operate the ignition switch 19 and the start/stop switch 20 without taking his/her hands off the steering wheel 9, it is no longer necessary to reach for switches located on a panel of the maneuvering seat 4 for operation. Therefore, it is possible to improve the operability of the ignition switch 19 and the start/stop switch 20.

[0040] In addition, in the preferred embodiment, since the ignition switch 19 and the start/stop switch 20 are located on the steering wheel 9 and the engine shutoff switch 29 is located on the column portion 11, it is possible to eliminate the need to arrange the ignition switch 19, the start/stop switch 20, and the engine shutoff switch 29 on the panel of the maneuvering seat 4, and it is possible to arrange other switches on the panel of the maneuvering seat 4. As a result, it is possible to improve the flexibility in the layout of other switches.

[0041] Furthermore, in the preferred embodiment, since it is possible to construct the marine vessel maneuvering system of FIG. 5 in the marine vessel 1 only by

arranging the marine vessel steering mechanism 5, which includes the steering wheel 9 and the column portion 11, on the marine vessel 1, without arranging the ignition switch 19, the start/stop switch 20, and the engine shutoff switch 29 on the panel of the maneuvering seat 4, it is possible to easily realize the control of the supply of the electric power to the engine, the control of start/stop of the engine, and the emergency-stopping function of the engine within the marine vessel 1.

[0042] It should be noted that in the preferred embodiment, the reason why the operation of the ignition switch 19, the operation of the start/stop switch 20, and the working (activation) of the engine shutoff switch 29 are transmitted to the remote control ECU 33 as the analog signals is to ensure signal transmission.

[0043] Alternatively to the preferred embodiment has been described above, for example, as shown in FIG. 6, the ignition switch 19 and the start/stop switch 20 may be located on the rotating portion 11a of the column portion 11 instead of the steering wheel 9. In this case, as shown in FIG. 7, as with the engine shutoff switch 29, the ignition switch 19 and the start/stop switch 20 are also connected to the remote control ECU 33 by individual wiring (see broken lines in FIG. 7), respectively.

[0044] Furthermore, in the case that the engine shutoff switch is configured by a simple push switch without a lanyard, this engine shutoff switch may be located on any one of the switches 21 to 28 of the steering wheel 9.

[0045] Although the marine vessel steering mechanism 5 according to the preferred embodiment is applied to the marine vessel 1 including the two outboard motors 3, there is no limitation on the type of the marine vessel to which the marine vessel steering mechanism 5 according to the preferred embodiment is applied, and it may be applied to a marine vessel equipped with inboard/outboard motors or inboard motors.

Claims

1. A marine vessel steering mechanism (5) for a marine vessel (1) comprising:
switches (19, 20, 29) related to starting and stopping of a power source of the marine vessel (1).
2. The marine vessel steering mechanism (5) according to claim 1, further comprising:
a steering wheel (9), and
wherein the steering wheel (9) includes the switches (19, 20, 29) related to starting and stopping of a power source of a marine vessel (1).
3. The marine vessel steering mechanism (5) according to claim 1 or 2, wherein the switches related to starting and stopping of the power source include at least one of an ignition switch (19) to start and stop a supply of electric power to the power source, a

start/stop switch (20) to start and stop the power source according to an operation, and an engine shutoff switch (29) to emergency-stop the power source.

4. The marine vessel steering mechanism (5) according to claim 2 and 3, wherein the steering wheel (9) includes the ignition switch (19) and the start/stop switch (20).
5. The marine vessel steering mechanism (5) according to claim 4, wherein the steering wheel (9) includes a central portion (13) that is supported rotatably around a rotation fulcrum (12), a wheel portion (14) that has an annular shape, and spoke portions (15, 16, 17) that connect the central portion (13) and the wheel portion (14), and
at least one of the ignition switch (19) and the start/stop switch (20) is located on one of the spoke portions (17).
6. The marine vessel steering mechanism (5) according to claim 5, wherein the one of the spoke portions (17), on which the at least one of the ignition switch (19) and the start/stop switch (20) is located, is positioned above a virtual plane (18) passing through the rotation fulcrum (12), and is positioned within an angle range from about 0° to about 60° with respect to the virtual plane (18) in a circumferential direction about the rotation fulcrum (12).
7. The marine vessel steering mechanism (5) according to claim 2 and 3, further comprising:
a column portion (11) that rotatably supports the steering wheel (9), and
at least one of the engine shutoff switch (29), the ignition switch (19) and the start/stop switch (20) is located on the column portion (11).
8. The marine vessel steering mechanism (5) according to claim 7, wherein on the column portion (11), the engine shutoff switch (29) is positioned below a virtual plane (18) passing through a rotational center of the steering wheel (9).
9. The marine vessel steering mechanism (5) according to at least one of the claims 3 to 8, wherein the ignition switch (19) and the start/stop switch (20) are located adjacent to each other.
10. The marine vessel steering mechanism (5) according to claim 2 and at least one of the claims 3 to 9, wherein the steering wheel (9) further includes a battery switch to switch whether or not the electric power is supplied from a battery.
11. The marine vessel steering mechanism (5) accord-

ing to at least one of the claims 3 to 10, wherein the ignition switch (19), the start/stop switch (20), and the engine shutoff switch (29) emit analog signals according to respective operations.

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- 12.** A marine vessel (1) having a hull (2) comprising:
a marine vessel steering mechanism (5) according
to at least one of the claims 1 to 11.

- 13.** The marine vessel (1) according to claim 12, with
the marine vessel steering mechanism (5) according
to claim 2 and 5, wherein the central portion (13) of
the steering wheel (9) is supported rotatably around
the rotation fulcrum (12) with respect to the hull (2)
of the marine vessel (1).

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- 14.** The marine vessel (1) according to claim 13, with
the marine vessel steering mechanism (5) according
to claim 6 or 8, wherein the virtual plane (18) passing
through the rotation fulcrum (12) is parallel to a
left/right direction with regard to the hull (2) of the
marine vessel (1).

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- 15.** The marine vessel (1) according to at least one of
the claims 12 to 14, wherein the power source is an
internal combustion engine or an electric motor.

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FIG. 1

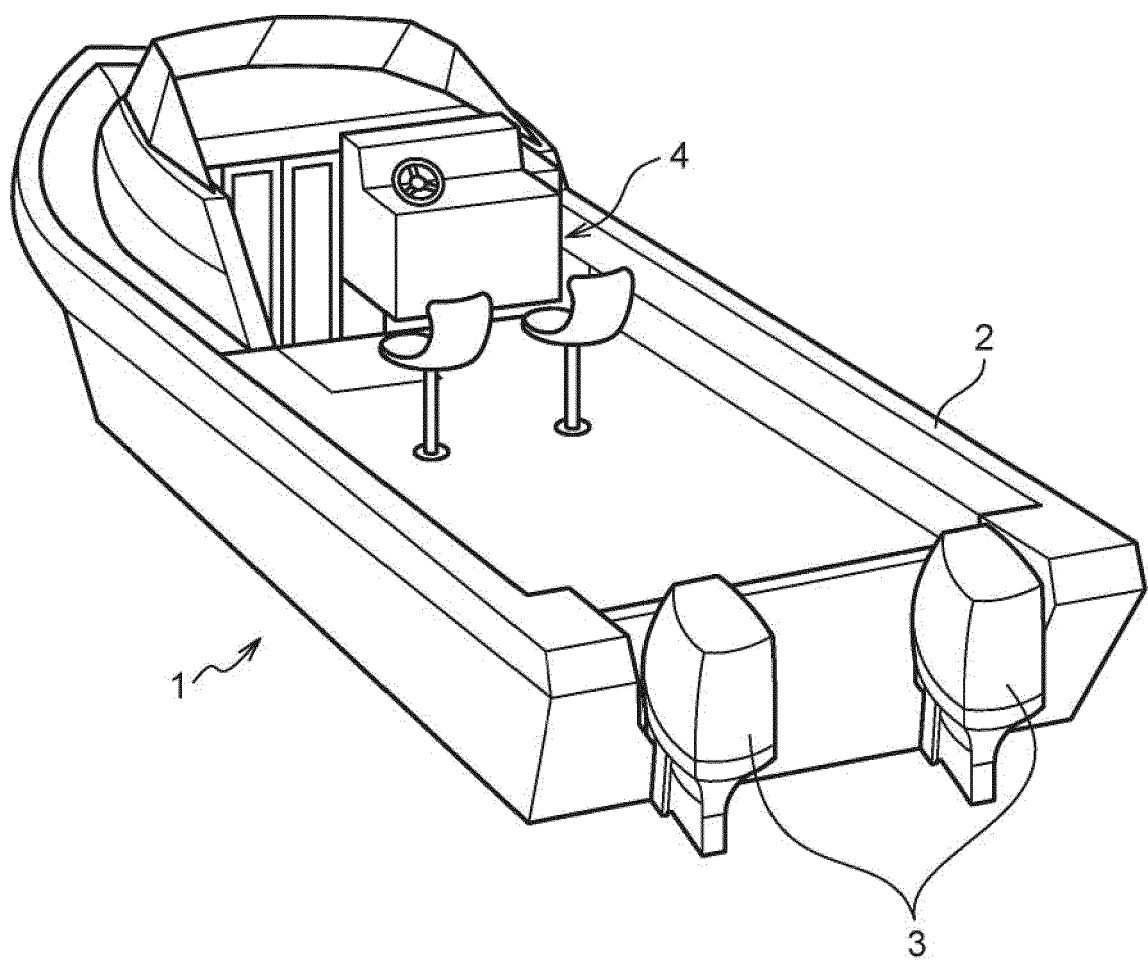


FIG. 2

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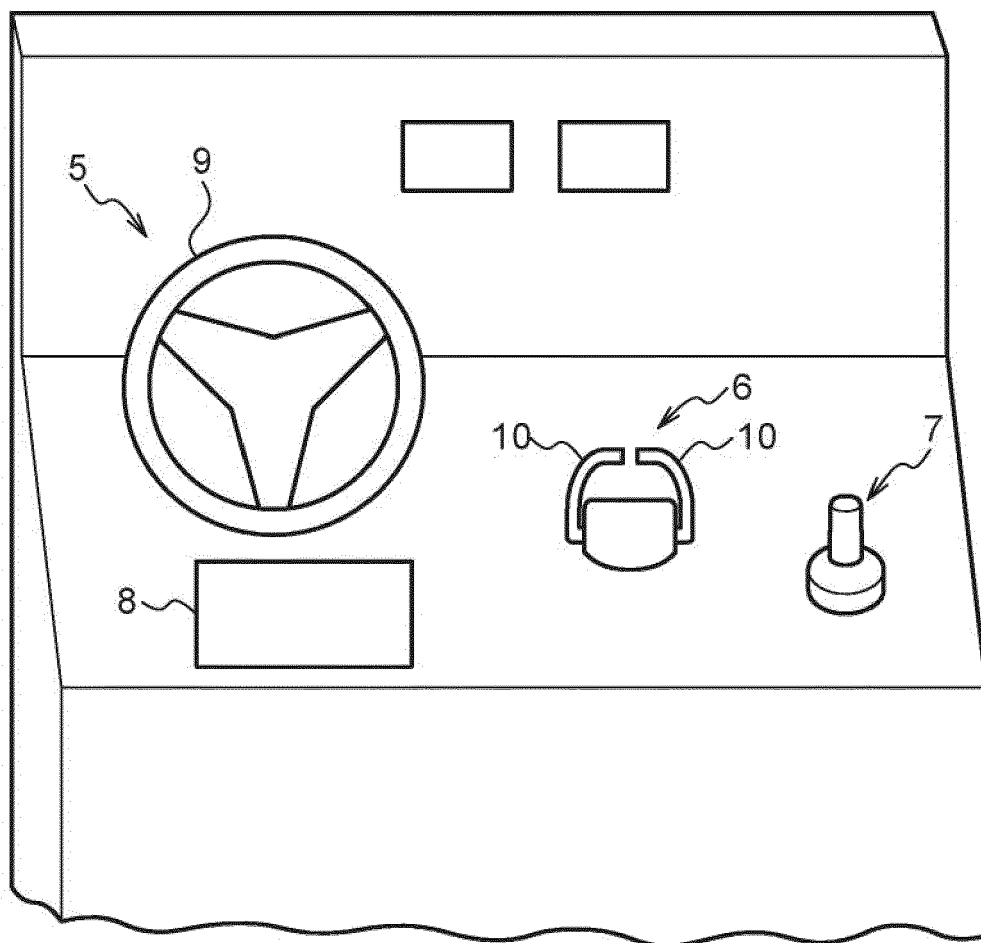


FIG. 3

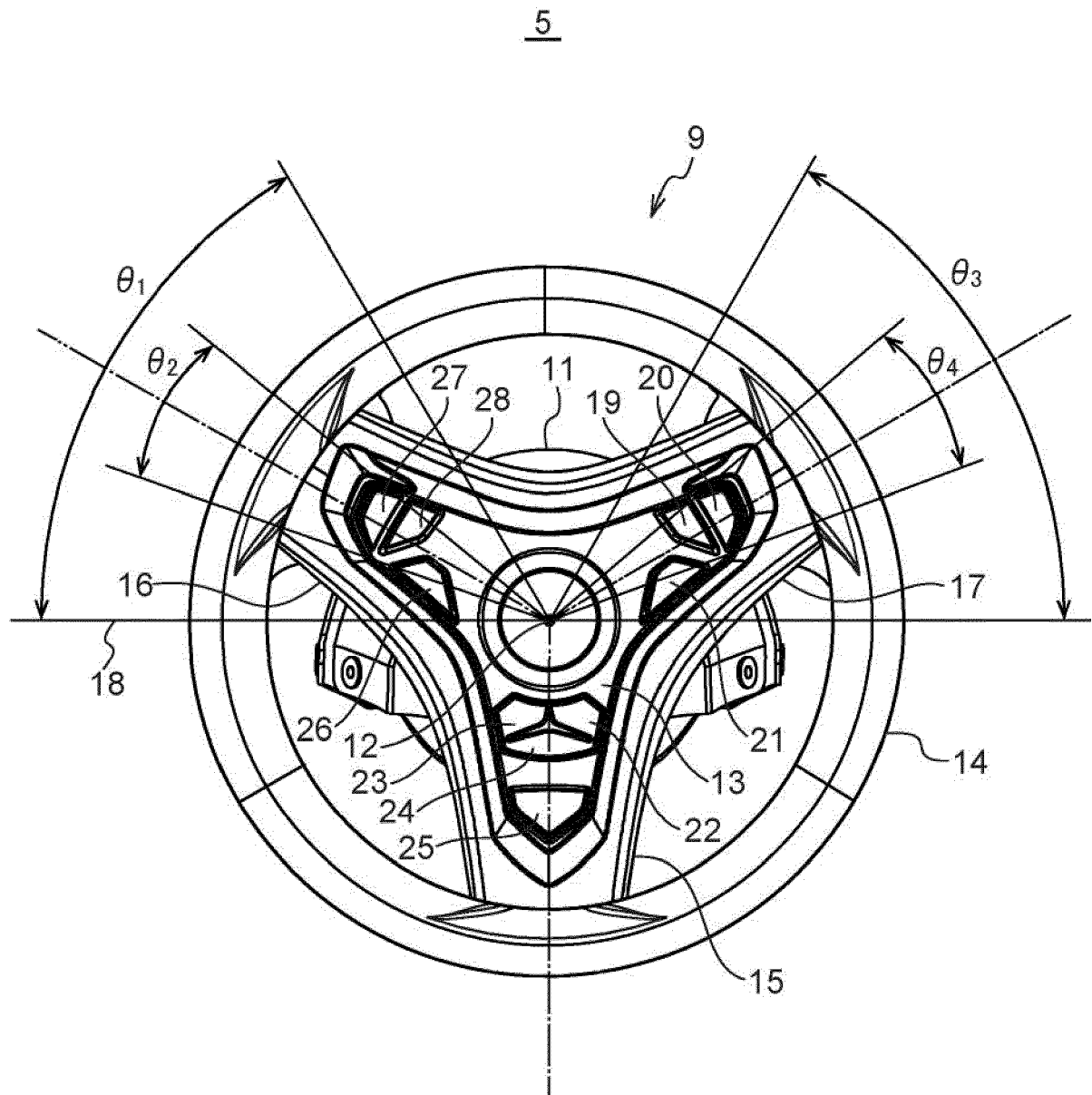


FIG. 4

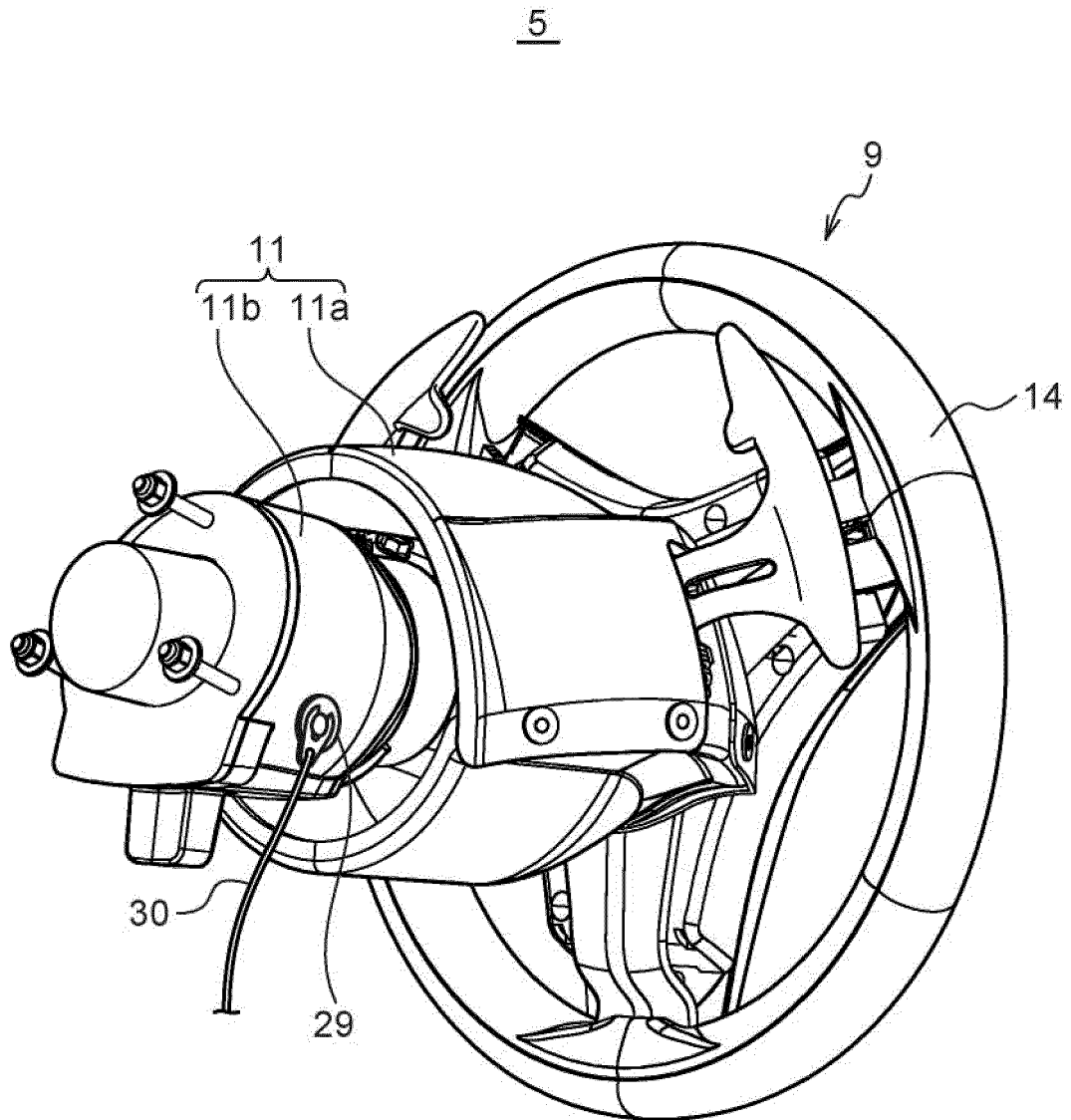


FIG. 5

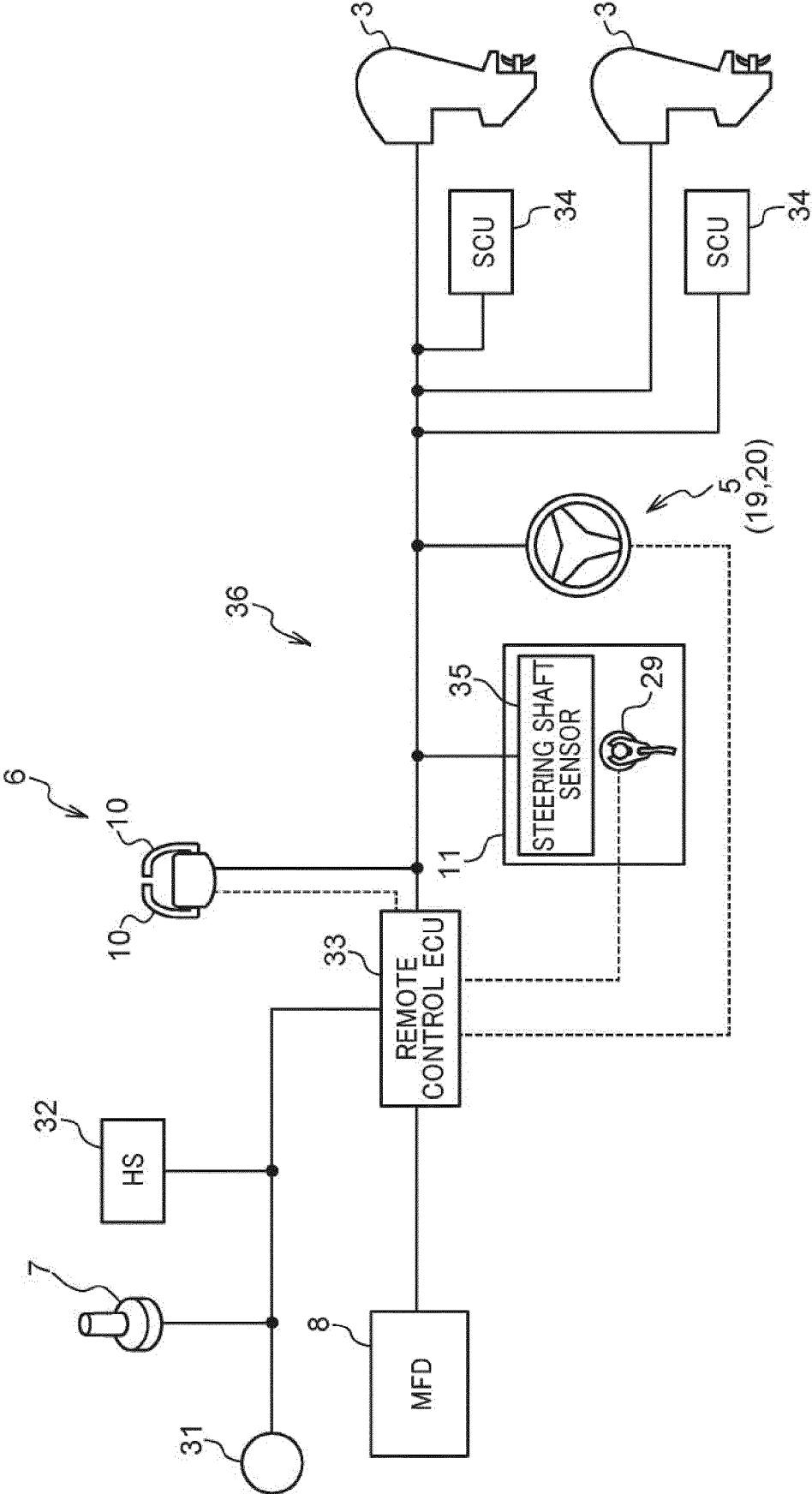


FIG. 6

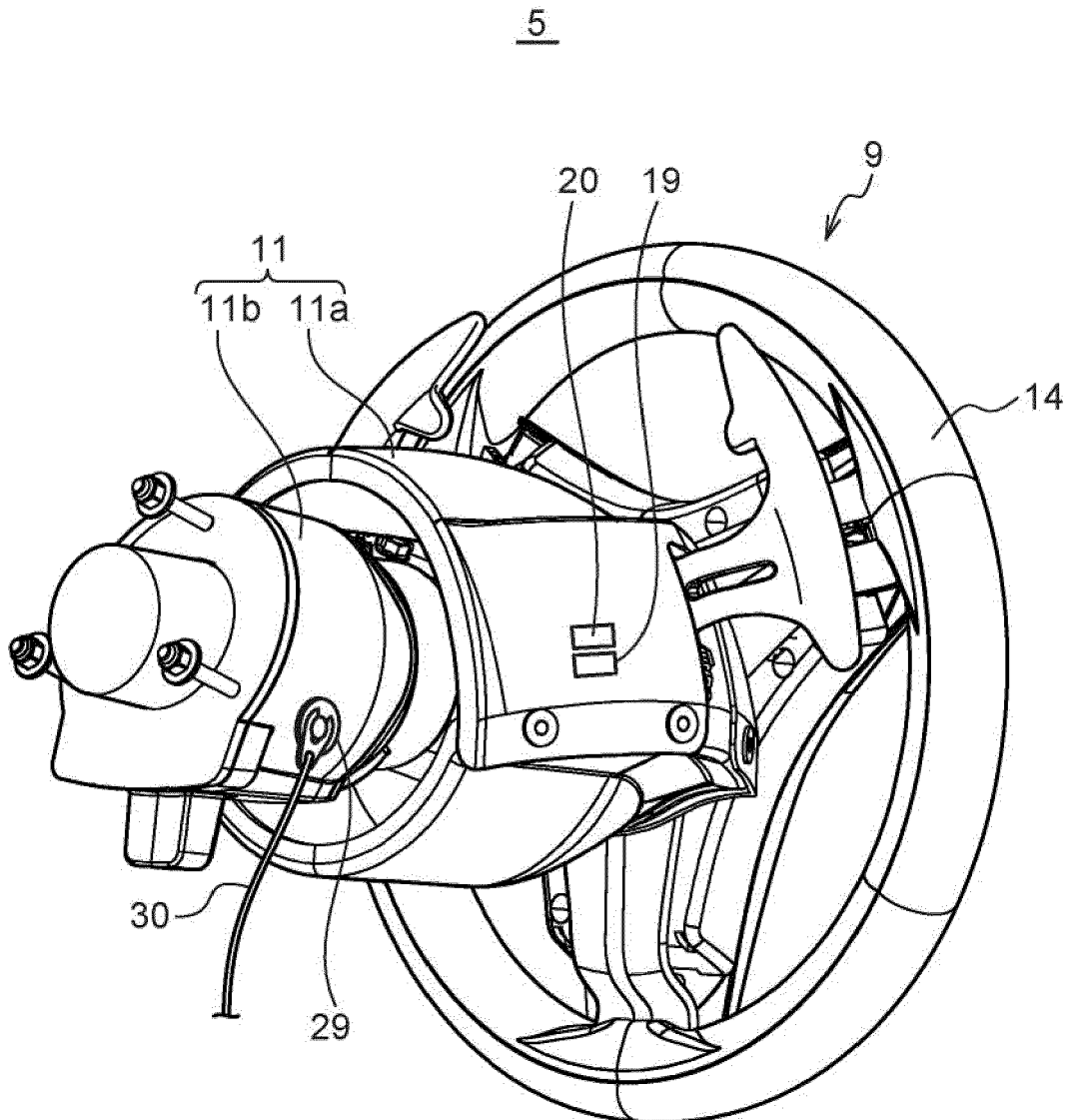
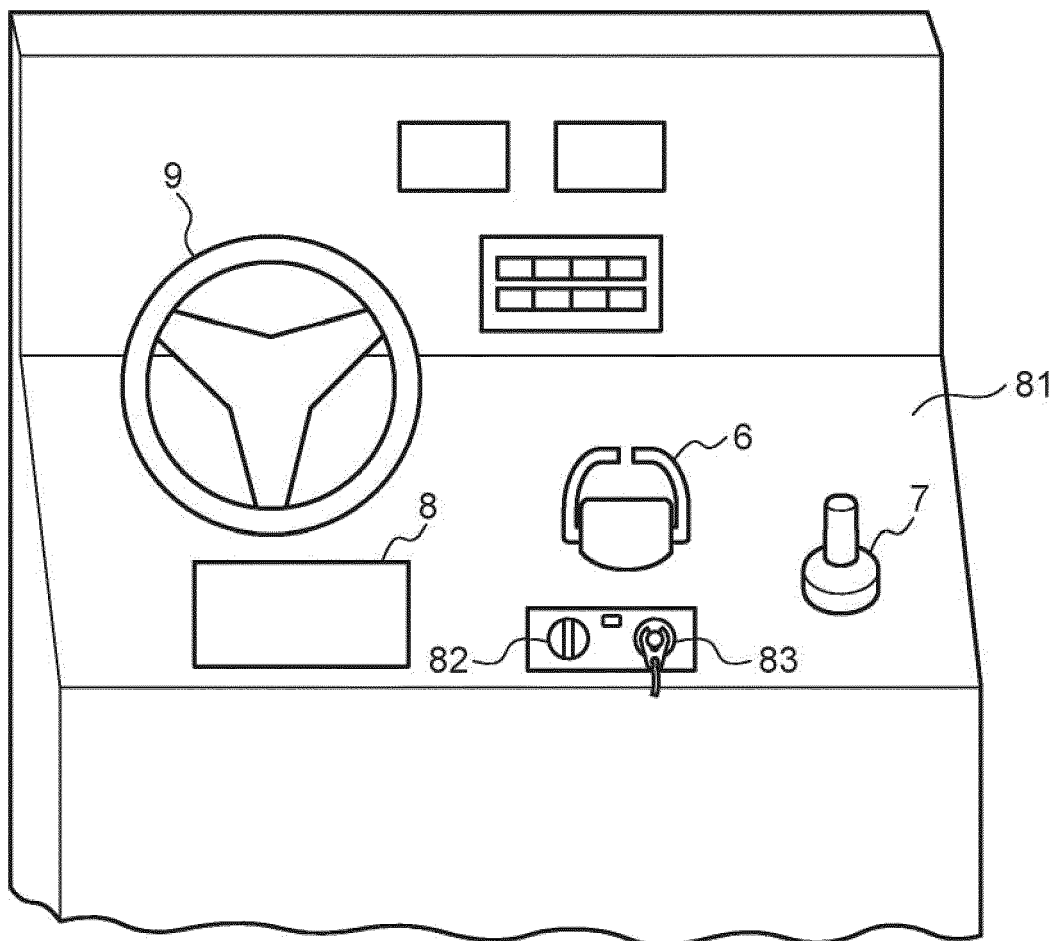


FIG. 8

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EUROPEAN SEARCH REPORT

Application Number

EP 22 21 2804

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 215 205 273 U (SHENZHILAN TIANJIN UNDERWATER INTELLIGENT TECH CO LTD) 17 December 2021 (2021-12-17)	1-4, 6, 10-15	INV. B63H25/02 B63H25/52
Y	* paragraphs [0001], [0062], [0063];	5, 7	
A	figures 1, 3, 9 *	8, 9	
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