REMOTE STEERING SYSTEM FOR OUTBOARD MOTOR

Inventor: Jeff Nyren, South Haven, MN (US)

Correspondence Address:
PATTERSON, THUENTE, SKAAR & CHRISTENSEN, P.A.
4800 IDS CENTER
80 SOUTH 8TH STREET
MINNEAPOLIS, MN 55402-2100 (US)

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ABSTRACT

A remotely located steering system for an outboard motor that can be mounted at any position in the boat. The remotely located steering system generally includes a mounting bracket, gear box, coupling mechanism, and at least one handle. The handle can be used to control motor speed, boat direction, and combinations thereof. In addition, a second handle can be incorporated to control a second motor, such as a trolling motor. The remotely located steering system can eliminate the need of a handle attached to the casement or cowling of an outboard motor allowing the boat operator to operate the boat from any location within the boat while freeing up space in the rear of the boat. In addition, the remotely located steering system can isolate a user from harmful forces transmitted through the outboard motor.
FIG. 5
REMOTE STEERING SYSTEM FOR OUTBOARD MOTOR

PRIORITY CLAIM

[0001] The present application claims priority to U.S. Provisional Application Ser. No. 60/754,013, filed Dec. 23, 2005 and entitled, “REMOTE STEERING SYSTEM FOR OUTBOARD MOTOR”, which is herein incorporated by reference in its entirety.

FIELD OF THE INVENTION

[0002] The present invention relates generally to a steering system for a motor boat. More particularly, the present invention relates to a steering system for a stern mounted outboard motor that is located remotely from the outboard motor to provide for safe operation and increased boat functionality. This could also apply in a tractor. The operator can be in a position to view the front and rear of the tractor in a more ergonomically correct position.

BACKGROUND OF THE INVENTION

[0003] Outboard motors for use in propelling boats are well known. In their simplest form, outboard motors can include an attached tilling handle by which an operator can control both the direction and speed of travel. While the basic outboard motor design functions well, there remain instances in which the attached tilling handle can suffer disadvantages. In order to successfully operate the outboard motor with the attached tilling handle, the operator of the boat is confined to the rear of the boat and must generally be within reach of the tiller handle. The space available for use in the rear of the boat can also be restricted by the rotational path of travel of the tilling handle, thereby reducing the overall usable space in the boat for the operator, passengers, and boating activities such as, for example, fishing and storage of related equipment. Finally, the direct manipulation of the tilling handle by an operator does not offer and protection from unforeseen and/or sudden movement of the outboard motor and consequently, the tilling handle, as a result of contact with unexpected obstacles such as, for example, rocks, shallow water, weeds, rough water conditions, and other such obstacles. Such unexpected movement can result in quick and violent movement of the tilling handle with a potential to cause either accident or injury to the operator and is therefore not optimal for boat operators.

[0004] Remote or auxiliary steering systems, on the other hand, provide the boat operator with more freedom of movement. For instance, console based steering systems can be used to control outboard motors with a steering wheel and throttle lever. However, these console based steering systems tend to be expensive and occupy valuable floor space within the boat. Examples of other remote steering systems include U.S. Pat. Nos. 3,580,212 to Fortson and 6,053,781 for operating trolling style motors remotely and U.S. Pat. Nos. 3,417,723 to Akermanis and 3,559,612 to Patterson for conventional trolling motors. However, not only are these designs impractical for controlling larger horsepower outboard motors but they fail to overcome the previously discussed limitations of space utilization, operator ergonomics and safety as previously discussed with traditional tilling handles.

[0005] As such, there remains a need for a remote auxiliary steering system for outboard motors that provides safer, more ergonomically correct operation of a boat while providing complete steering and speed control of the motor.

SUMMARY OF THE INVENTION

[0006] A remote steering system for an outboard motor of the present disclosure generally comprises a housing assembly that can be positioned at any desirable position within a boat. The housing assembly can be mountable to a seat, bench or stand using upper and lower mounting portions. The remote steering system generally controls operation of the outboard motor with a hydraulic pump, a coupling mechanism, and at least one remote tilling handle. The at least one remote tilling handle can be used to control motor speed, boat direction, motor trim position and combinations thereof. The remote steering system can include a second remote tilling handle so as to operably control a second motor such as, for example, a trolling or backtrolling motor.

[0007] In one aspect, a remote steering assembly of the present disclosure can comprise a remote housing enclosing a steering assembly and a throttle control. Marine steering lines and a throttle cable can operably connect the remote housing to an outboard motor for controlling a boat direction and boat speed. The remote housing can include at least one remote tilling handle allowing the operator to remotely interface with the outboard motor to determine boat direction and boat speed. In some embodiments, the remote tilling handle can include a trim control allowing the operator to vary the trim position of the outboard motor. In some embodiments, the remote housing can include a second remote tilling handle for operably controlling a second motor. The remote housing can include upper and lower mounting portions allowing the remote housing to be positioned at a desired location within the boat. The remote steering assembly can include a dampering assembly for reducing the impact of external forces to the outboard motor that are transmitted through the steering assembly.

[0008] In another aspect, a method for a motor boat having a stern mounted outboard motor can comprise providing a remote steering assembly that is operably connected to the outboard motor. The method can further comprise providing a remote tilling handle on the remote steering assembly such that one or more of a boat direction, a boat speed and a trim position can be remotely manipulated. The method can further include the step of controlling as second motor with a second remote tilling handle. The method can further comprise eliminating a tiller handle attached to the motor so as to increase the usable space in a stern portion of the boat without the need for a large footprint steering console. The method can further comprise insulating an operator from sudden and/or harmful forces transmitted through the outboard motor.

[0009] In yet another aspect, the present disclosure is directed to a boat having a stern mounted outboard motor, wherein the motor speed and direction can be operably controlled through a remotely located tilling handle. The remotely located tilling handle can be attached to a housing assembly that includes a steering assembly and a throttle control. In some embodiments, the housing assembly can include a second remotely located tilling handle for controlling a second motor such as, for example, a trolling or backtrolling motor.

[0010] The above summary of the invention is not intended to describe each illustrated embodiment or every
implementation of the present invention. For example, a remotely located steering system of the present invention can be similarly employed in other vehicles such as, for example, a tractor. The figures and the detailed description that follow more particularly exemplify these embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The invention may be more completely understood in consideration of the following detailed description of various embodiments of the invention in connection with the accompanying drawings, in which:

[0012] FIG. 1 is a perspective view of a boat having a representative stem mounted outboard motor of the prior art.

[0013] FIG. 2 is a perspective view of an embodiment of a remotely located outboard motor steering system of the present invention.

[0014] FIG. 3 is a side, sectional view of the remotely located outboard motor steering system of FIG. 2.

[0015] FIG. 4 is a perspective view of the remotely located outboard motor steering system of FIG. 2 attached to a bench-style seat.

[0016] FIG. 5 is a side view of a boat having a stern mounted outboard motor controlled by the remotely located outboard motor steering system of FIG. 2.

[0017] While the invention is amenable to various modifications and alternative forms, specifics thereof have been shown by way of example in the drawings and will be described in detail. It should be understood, however, that the intention is not to limit the invention to the particular embodiments described. On the contrary, the intention is to cover all modifications, equivalents, and alternatives.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] As illustrated in FIG. 1, a conventional outboard motor 100 of the prior art can be attached to a rear or stern portion 102 of a boat 104 to propel the boat 104 through the water. Outboard motor 100 generally includes a tilting handle 106 attached proximate a motor casement or cowling 108 on the outboard motor 100. Generally, boat 104 is operated by a user through manipulation of the tilting handle 106 as well as a transmission lever 110. Tilting handle 106 generally comprises a rotatable throttle control 107 for rotatably adjusting the motor’s speed. Transmission lever 110 can be slightly adjusted between forward, neutral, and reverse positions for controlling the rotation direction of propeller 112 for providing forward and reverse motion to the boat 104. Representative outboard motors 100 are manufactured by a variety of manufacturers such as, for example, Yamaha, Honda, Suzuki, Evinrude, Nissan, Johnson, Mercury, and other outboard motor manufacturers.

[0019] As illustrated in FIGS. 2, and 3, an embodiment of a remotely located outboard steering system 200 can comprise a housing 202 that protects and mounts the various elements of remotely located outboard steering system 200. Housing 202 can be comprised of aluminum, stainless steel, plastic, treated or coated wood products, and other materials suitable for a marine environment. Depending upon the materials used for housing 202, housing 202 can be fabricated as a single unitary structure or can comprise a plurality of subassemblies that are operably joined using suitable connecting methods.

[0020] Referring again to FIGS. 2 and 3, housing 202 is generally defined by an upper housing portion 204, a lower housing portion 206, an instrument panel 208 and a mounting panel 210. Upper housing portion 204 generally includes an upper panel 204a, a rear panel 204b and bottom panel 204c. Lower housing portion 206 generally includes a front panel 206a, a bottom panel 206b and a rear flange 206c. Rear flange 206c can include a cut-away portion 206d. Instrument panel 208 provides a viewing surface 212 for operably locating appropriate an engine instrument 213 such as, for example, gauges, switches and indicators for monitoring operation of outboard motor 100. For instance, engine instrument 213 can include one or more of fuel level indicators, rpm indicators, oil gauges, battery indicator, speed indicator, depth finder, power switch, priming switch, motor trim position and other such indicators and combinations thereof.

[0021] Referring to FIG. 4, housing 202 can further include a plurality of fastening members 214 for operably positioning the remotely located outboard steering system 200 at desired locations. For instance, fastening members 214 can be used to join the upper housing portion 204 and/or the lower housing portion 206 to structures such as, for example, a bench-style seat 215 as illustrated in FIG. 4. In some embodiments, the fastening members can include adjustable clamp-style fasteners for detachable connecting the housing 202 to suitable structures within a boat such as, for example, the side walls, the bow wall, the stern wall, or the gunwale of the boat.

[0022] As depicted in FIGS. 2 and 3, remotely located outboard steering system 200 can comprise a tilting handle 216 having a rotatable throttle control 218. Tilt handle 216 is mounted to mounting panel 210 with a rotatable swivel mount 220. Rotatable swivel mount 220 allows the operator to rotate tilting handle 216 around a vertical axis “Y”. In some embodiments, rotatable swivel mount 220 can further provide for vertical movement of tilting handle 216 around a horizontal axis “X”. Vertical movement of tilting handle 216 can allow an operator to adjust the tilt angle of the tilting handle 216 to an ergonomic, comfortable position. Alternatively, tilting handle 216 can be positioned vertically to actuate a commercially available tilt-and-tilt system for raising and lowering the position of the outboard motor. Preferably, tilting handle 216 is constructed to have a shorter length than tilting handle 106 as it is no longer necessary for tilting handle 216 to extend from the outboard motor 100 such that it is reachable by a user located in stern portion 102. Thus, tilting handle 216 preferably occupies a minimum amount of space within the boat.

[0023] Referring to FIG. 3, remotely located outboard steering system 200 comprises means of translating movement of tilting handle 216 to a stern mounted outboard motor. Rotatable swivel mount 220 projects through the mounting panel 210 where a connector 221 operably interconnects the tilting handle 216 to a marine steering system 222 and a throttle command system 224. Connector 221 can be retained to housing 202 with a connector bracket 223. Connector 221 can comprise a Love Joy OR style coupling that can include a 4 to 1 gear ratio allowing for easier manipulation of the marine steering system 222.
Marine steering system 222 can comprise commercially available marine steering systems including hydraulic assemblies, mechanical assemblies and combinations thereof. In one representative embodiment, marine steering system 222 can comprise a SeaStar® hydraulic steering assembly available from the Teleflex® Marine of Litchfield, Ill. wherein a hydraulic steering pump 226 is operably coupled to the tilling handle 216. The hydraulic steering pump 226 translates the rotational input from the tilling handle 216 into hydraulic pressure that is translated through steering lines 228a, 228b for actuating a stern located hydraulic cylinder that in turn, is operably connected to the outboard motor such that the motor is rotated as directed by the tilling handle 216. In some embodiments, marine steering system 222 can further comprise a damping system such as, for example, a hydraulic bleed valve operably coupled to the hydraulic steering pump 226 or to the stern located hydraulic cylinder so as to minimize unforeseen movement of tilling handle 216 due to an unexpected obstacle such as rock, weeds, rough waters, and the like. The damping system dissipates the energy of the unforeseen movement before it is transferred to tilling handle 216. Therefore, the operator remains in control of tilling handle 216 and the risk of injury is reduced.

Throttle command system 224 can comprise a throttle cable 230 that translates a rotational input on the rotatable throttle control 218 to the outboard motor for adjustably selecting the power output of the outboard motor. Throttle command system 224 can be rotated about an axis “z” running through the tilling handle 216. Throttle command system 224 can comprise a neutral position wherein the throttle cable 230 maintains the motor in neutral. By rotating rotatable throttle control 218 clockwise from the neutral position, the output of outboard motor increases in a forward direction resulting in the boat being propelled forward. By rotating rotatable throttle control 218 in a counterclockwise direction from the neutral position, the rotation of the propeller is reversed causing the boat to move in a reverse direction.

In use, remotely located outboard steering system 200 is positioned at a desired location within a boat 240 as illustrated in FIG. 5. Steering lines 228a, 228b and throttle cable 230 can be located within a protective sheath or otherwise covered so as prevent exposure of the steering lines 228a, 228b and throttle cable 230 to the elements and to protect them from damage. In embodiments where tilling handle 216 controls a tilt-and-trim system, trim wiring can accompany the steering lines 228a, 228b and throttle cable 230. Steering lines 228a, 228b and throttle cable 230 are run through cut-away portion 206d to an outboard motor 244, wherein the steering lines 228a, 228b can be interconnected with the hydraulic cylinder and the throttle cable is connected to the engine throttle. With housing 202 fixedly mounted to the boat 240, an operator manipulates tilling handle 216 and rotatable throttle control 218 in a manner similar that of the conventional tilling handle 106. When tilling handle 216 is rotated about the vertical axis “y”, hydraulic steering pump 226 directs pressurized hydraulic fluid through the steering lines 228a, 228b such that an outboard motor 244 turns in conjunction with the tilling handle 216. When rotatable throttle control 218 is turned, the throttle cable 230 adjustably varies the output of outboard motor 244. Using remotely located outboard steering system 200, a user can control higher horsepower outboard motors than can be used with tilling handle 106.

Referring again to FIGS. 3, 4 and 5, remotely located outboard steering system 200 can further comprise a second tilling handle 250 rotatably attached to mounting plate 210 for remotely operating a second motor. Second tilling handle 250 can include a second marine steering system and a second throttle command system similar in design and arrangement to marine steering system 222 and throttle command system 224. Second tilling handle 250 can be used for operably controlling a trolling or backtrolling motor from the remotely located outboard steering system 200.

The invention therefore addresses and resolves many of the deficiencies and drawbacks inherent with stern mounted outboard motors of the prior art and their operation. The invention may be embodied in other specific forms such as, for example, as a remote steering system for a tractor, without departing from the essential attributes thereof; therefore, the illustrated embodiments should be considered in all respects as illustrative and not restrictive. The claims provided herein are to ensure adequacy of the present application for establishing foreign priority and for no other purpose.

What is claimed:
1. A motor control assembly for a stern mounted outboard motor comprising:
   a housing enclosing a throttle control system and a motor steering system, the housing having a mounting bracket for engaging a boat component located remotely from the outboard motor, the housing further including a swivel mount for attaching a remote tilling handle; and
   an interface assembly operably interconnecting the throttle control system and the motor steering system with the outboard motor,
   wherein an operator’s manipulation of the remote tilling handle is communicated to the outboard motor through the interface assembly such that the outboard motor acts in response to the remote tilling handle manipulation.
2. The motor control assembly of claim 1, wherein the remote tilling handle comprises a hand throttle and a trim control
3. The motor control assembly of claim 1, wherein the housing comprises an instrument panel having one or more marine instruments mounted therein, the one or more instrument panels being operably interconnected to the outboard motor or a remote marine probe with the interface assembly.
4. The motor control assembly of claim 3, wherein the one or more marine instruments is selected from the group comprising: a fuel gauge indicator, a motor rpm indicator, an engine oil indicator, an engine temperature indicator, a battery level indicator, a speedometer, a tachometer, a depth finder, a trim indicator, a bilge control, a live-well control, a radio, a depth gauge and an ignition switch.
5. The motor control assembly of claim 1, wherein the swivel mount comprises a biaxial swivel mount having both
the horizontal positioning axis and a vertical positioning axis for manipulating a vertical trim position of the outboard motor with the remote tilling handle.

7. The motor control assembly of claim 6, wherein the bi-axial swivel mount includes a motor damper assembly so as to dampen the translation of forces between the outboard motor and the remote tilling handle.

8. The motor control assembly of claim 5, wherein the motor steering system includes a power steering assembly so as to reduce an input force necessary for directing the remote tilling handle along the horizontal positioning axis.

9. The motor control assembly of claim 1, further comprising:

an auxiliary tilling handle operably connected to a second remote motor through the interface assembly.

10. The motor control assembly of claim 1, wherein the second remote motor is selected from the group comprising: a trolling motor and a back trolling motor.

11. The motor control assembly of claim 1, wherein the remote tilling handle includes a trim control for manipulating a vertical trim position of the outboard motor with the remote tilling handle.

12. The motor control assembly of claim 1, wherein the remote tilling handle includes a rotatable throttle member operably connected to the outboard motor through the interface assembly such that a boat speed is controlled through the remote tilling handle.

13. The motor control assembly of claim 1, wherein the housing includes a control battery for operating the throttle control system and the motor steering system independently of the outboard motor.

14. A method for operating a boat driven by a stern mounted outboard motor, comprising:

providing a motor control assembly having a housing enclosing a throttle control system and a motor steering system and having a remote tilling handle attached thereto;

mounting the motor control assembly to a boat component located remotely from the outboard motor,

connecting an interface assembly between the motor control assembly and the outboard motor, and

manipulating the remote tilling handle to remotely turn the outboard motor.

15. The method of claim 14, further comprising:

adjusting a trim position of the outboard motor by manipulating the remote tilling handle along a vertical axis.

16. The method of claim 14, further comprising:

manipulating an auxiliary tilling handle attached to the housing to control operation of a second remote motor.