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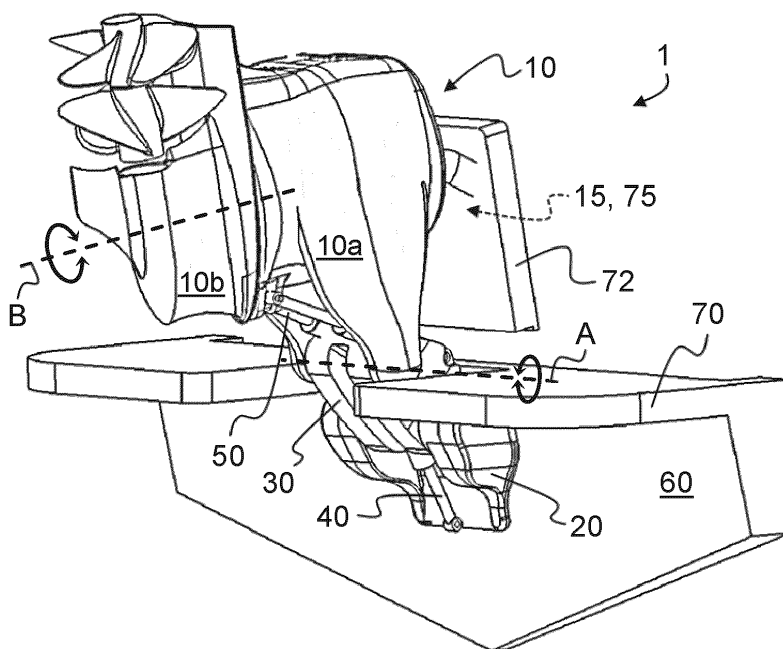
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(54) **A MARINE PROPULSION SYSTEM WITH A MOVABLE SWIM PLATFORM**

(57) The present disclosure relates to a propulsion system (1) for a marine vessel (60) comprising a swim platform (70), the propulsion system (1) comprising a drive unit (10) and a transom bracket (20) for movably attaching the drive unit (10) to the marine vessel (60) such that the drive unit (10) may be moved between a

lower position and a higher position, wherein the drive unit (10) is adapted to be connected to the swim platform (70) such that at least a portion of the swim platform (70) is manoeuvrable by the drive unit (10) being moved between its lower and higher positions. The disclosure further relates to a marine vessel (60).



Description

TECHNICAL FIELD

[0001] The disclosure relates generally to marine propulsion. In particular aspects, the disclosure relates to a propulsion system for a marine vessel that comprises a swim platform. The disclosure can be applied to marine vessels, such as water crafts, motorboats, work boats, sport vessels, sailboats, boats, ships, among other vessel types. Although the disclosure may be described with respect to a particular vessel, the disclosure is not restricted to any particular vessel.

BACKGROUND

[0002] Marine vessels may be provided with a swim platform and one or more drive units to propel the marine vessel in water. There exist various solutions for attaching the swim platform and suspending the drive unit(s).

[0003] Prior art solutions are marred with various drawbacks such as limited swim platform accessibility, poorly suspended drive unit(s) and/or bulky, complex and high-cost designs.

SUMMARY

[0004] According to a first aspect of the disclosure, there is provided a propulsion system for a marine vessel comprising a swim platform, the propulsion system comprising a drive unit and a transom bracket for movably attaching the drive unit to the marine vessel such that the drive unit may be moved between a lower position and a higher position, wherein the drive unit is adapted to be connected to the swim platform such that at least a portion of the swim platform is manoeuvrable by the drive unit being moved between its lower and higher positions.

[0005] The first aspect of the disclosure may seek to provide a highly accessible swim platform, as the swim platform may be manoeuvred in a manner that allows a person to enter or exit the vessel from water or a dock or pier or similar. A technical benefit may include that the drive unit is rigidly suspended by being attached to the vessel by means of the transom bracket, while the drive unit at the same time may be utilised to manoeuvre the swim platform, or at least a portion thereof. In other words, the drive unit is movably attached to the marine vessel and the swim platform is movable by means of the drive unit. The swim platform, or portion thereof, is movably attached to the vessel and its movement may be accomplished by a movement of the drive unit. In addition, or alternatively, the drive unit may be movable to a position above at least a portion of the swim platform for inspection and service of the drive unit. Furthermore, the swim platform, or portion thereof, may be manoeuvred to be arranged in a position such that it may function as a backrest.

[0006] By the swim platform being manoeuvrable may be meant that the swim platform is movable, for example may be raised and lowered and/or turned. If the swim platform may be turned, it may typically be turned about an axis that extends port to starboard. By the swim platform being manoeuvrable may be meant that a portion of the swim platform, such as a hatch, is movable with respect to the remaining portion of the swim platform. Such a remaining portion, i.e. the swim platform excluding the hatch, may be stationary.

[0007] Optionally, the swim platform may comprise an essentially flat upper side. Thus, the swim platform may be free from steps or similar height differences.

[0008] Optionally, at least a portion of the swim platform may be raised and lowered by means of the connection to the drive unit. Such a portion may be a hatch. Optionally, the entire swim platform may be raised and lowered by means of the connection to the drive unit.

[0009] Optionally, the portion of the swim platform is carried by the drive unit. For example, the drive unit may form the only load-bearing connection between said portion and the marine vessel.

[0010] Optionally, the swim platform is carried by the drive unit. For example, the drive unit may form the only load-bearing connection between the swim platform and the marine vessel.

[0011] Optionally, the drive unit comprises a drive platform interface for connection to the swim platform. A technical benefit may include that the swim platform or a portion thereof may be securely attached to the drive unit. For example, the drive unit may push the platform (portion) upwards and pull the same downwards. The drive platform interface of the drive unit may be referred to as a platform interface.

[0012] Optionally, the drive platform interface of the drive unit is configured for connection to a platform drive interface of the swim platform. A technical benefit may include that the swim platform or a portion thereof may be securely attached to the drive unit. The swim platform may be adapted for connection to the drive platform interface. The platform drive interface of the swim platform may be referred to as a drive interface.

[0013] Optionally, the drive platform interface of the drive unit and the platform drive interface of the swim platform are configured to engage in a positive fit connection. Such a connection may be particularly secure and sturdy. Further, the positive fit connection may keep the swim platform, or a portion thereof, connected to the drive unit at all times. For example, the positive fit connection may keep the swim platform, or a portion thereof, connected to the drive unit in windy conditions and harsh sea conditions. The positive fit connection may be beneficial for durability, ensuring low noise and safety, as the swim platform, or a portion thereof, is kept in place.

[0014] Optionally, the drive platform interface and the platform drive interface are configured for sliding engagement. A technical benefit may include that at least a portion of the swim platform may be manoeuvrable by the

drive unit while a mutual sliding movement is allowed. For example, said portion may be a hatch and the drive unit may pivot the hatch about a hinge axis while the drive does not pivot about the hinge axis. Instead, the drive unit may pivot about an axis that is parallel to the hinge axis, or may perform a translatory and rotary movement.

[0015] Optionally, the propulsion system comprises a connecting arm that comprises a first pivot joint connected to the drive unit and a second pivot joint connected to the transom bracket. A technical benefit may include that drive unit may be trimmed in different trim angles of the drive unit independently of water depth. Additionally, the drive unit may be moved up and down as well as translated rearwards in relation to the transom bracket while maintaining a desired thrust angle. Thus, the propulsion system may allow for a reduced draft and manoeuvring in shallow waters e.g. close to beaches. A further technical benefit may include a compact, sturdy and cost-effective design.

[0016] Optionally, the propulsion system is configured such that the drive unit may be raised and lowered by pivoting the connecting arm about the second pivot joint that is connected to the transom bracket. Thus, advantageously, the connecting arm together with the drive unit may e.g. be raised above the water line of the vessel. The second pivot joint may be aligned with an essentially horizontal axis. The second pivot joint may be aligned with an axis that may be referred to as a tilt axis.

[0017] Optionally, the propulsion system is configured such that the drive unit may be raised, by pivoting of the connecting arm about the second pivot joint, to a position above the water line of the marine vessel, and optionally to a position vertically higher than the swim platform. In other words, to a position that is vertically higher than the vertical position of the swim platform when the drive unit is in a lower or lowest position. If the drive unit may be raised vertically higher than the water line, marine growth on the drive unit may be minimised. If the drive unit may be raised vertically higher than the swim platform, visual inspection of the drive unit may be facilitated.

[0018] Optionally, the propulsion system is configured such that a thrust angle of the drive unit may be controlled by pivoting the drive unit about the first pivot joint of the connecting arm. The first pivot joint may be aligned with an essentially horizontal axis. The first pivot joint may be aligned with an axis that may be referred to as a trim axis.

[0019] Optionally, the swim platform comprises a hatch to which the drive unit is adapted to be connected, and the portion of the swim platform that is manoeuvrable by the drive unit is the hatch. Thus, there may be provided a propulsion system for a marine vessel comprising a swim platform with a hatch, the propulsion system comprising a drive unit and a transom bracket for movably attaching the drive unit to the marine vessel such that the drive unit may be moved between a lower position and a higher position, wherein the drive unit is adapted to be connected to the swim platform such that the hatch is manoeuvrable by the drive unit being moved between

its lower and higher positions. A technical benefit may include that the drive unit and the hatch may be movable to a position that is vertically higher than the remaining (stationary) portion of the swim platform. Advantageously, the swim platform may comprise an essentially flat upper side when the hatch is closed (drive unit in lower or lowest position).

[0020] Optionally, the drive unit comprises a support part and a thrust part, wherein the thrust part is rotatable with respect to the support part about a steering axis to direct the thrust of the drive unit. A technical benefit may include that the design of the above described transom bracket and other components may be simplified, as the thrust may be directed by rotating the thrust part with respect to the support part. In other words, the drive unit need not be movably attached to the vessel to allow for directing the thrust for steering purposes. The support part may be adapted to be connected to the swim platform. In this manner, there is no need for a link arrangement or similar to connect the drive unit to the swim platform in a manner that allows the entire drive unit to rotate about a steering axis.

[0021] Optionally, the drive unit comprises an electric propulsion motor. Thus, the propulsion system may be an electric propulsion system. The propulsion system may be a forward or a rearward drive propulsion system. For example, the propulsion system may be a forward drive electric propulsion system. If the drive unit comprises a support part and a thrust part that is rotatable with respect to the support part about a steering axis to direct the thrust of the drive unit, the propulsion system may be a forward and rearward drive propulsion system. Thus, the propulsion system may be a forward and rearward drive electric propulsion system. The drive unit may comprise one propeller or two contra-rotating propellers.

[0022] Optionally, the propulsion system is configured such that the drive unit is tiltable about a tilt axis and trimmable about a trim axis that is separate from the tilt axis. A technical benefit may include that drive unit may be trimmed in different trim angles independently of water depth. Additionally, the drive unit may be moved up and down as well as translated rearwards in relation to the transom bracket while maintaining a desired thrust angle. Thus, the propulsion system may allow for a reduced draft and manoeuvring in shallow waters e.g. close to beaches. In addition, the swim platform may be moved up and down and turned, to be positioned and oriented to provide accessibility.

[0023] According to a second aspect of the disclosure, there is provided a marine vessel comprising the propulsion system described herein. Advantages of the second aspect of the disclosure correspond to those of the first aspect.

[0024] The disclosed aspects, examples (including any preferred examples), and/or accompanying claims may be suitably combined with each other as would be apparent to anyone of ordinary skill in the art. Additional features and advantages are disclosed in the following

description, claims, and drawings, and in part will be readily apparent therefrom to those skilled in the art or recognized by practicing the disclosure as described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] Examples are described in more detail below with reference to the appended drawings.

[0026] FIG. 1 and 2 are exemplary views of a propulsion system comprising a drive unit.

DETAILED DESCRIPTION

[0027] The detailed description set forth below provides information and examples of the disclosed technology with sufficient detail to enable those skilled in the art to practice the disclosure.

[0028] The inventive concept of the present disclosure involves connecting a drive unit, which is attached to a marine vessel by means of a transom bracket, to a swim platform such that at least a portion of the swim platform is manoeuvrable by the drive unit.

[0029] FIG. 1 and 2 show an exemplary propulsion system 1 for a marine vessel 60. The propulsion system 1 comprises a drive unit 10 and a transom bracket 20 for attaching the drive unit 10 to the marine vessel 60. A stern of a marine vessel 60 comprising a transom to which the transom bracket 20 is secured, as well as a swim platform 70 with a hatch 72, are also schematically illustrated. FIG. 1 illustrates the drive unit 10 in a highest, tilted up, position whereas FIG. 2 illustrates the drive unit in a position between its lowest and highest positions.

[0030] The transom bracket 20 is configured to movably attach the drive unit 10 to the vessel 60 such that the drive unit 10 may be moved between a lower and a higher position. In the present examples, the drive unit is connected to the hatch 72 of the swim platform 70 such that the hatch 72 is manoeuvrable by the drive unit 10 being moved between its lower and higher positions. In undepicted examples, the entire swim platform 70 may be manoeuvrable by the drive unit 10.

[0031] As is best shown in FIG. 1, the present propulsion system 1 comprises a first actuator 40 for moving the drive unit 10. In the present examples, the first actuator 40 is arranged to tilt (pivot) the drive unit 10 about a first axis A (tilt axis). The first actuator may be referred to as a tilt actuator 40. Further, the present propulsion system 1 comprises a second actuator 50 for moving the drive unit 10. In the present examples, the second actuator 50 is arranged to trim (pivot) the drive unit 10 about a second axis A1 (trim axis, denoted in FIG. 2). The second actuator may be referred to as a trim actuator 50.

[0032] In this context, trimming a drive unit may typically involve adjusting its thrust angle a few degrees about a neutral thrust angle. Tilting a drive unit may typically involve lifting at least a part of the drive unit above the water line of the marine vessel.

[0033] In undepicted examples, the propulsion system

may comprise alternative arrangements for moving, e.g. trimming and/or tilting, the drive unit. For example, there may be one single axis about which the drive unit may be pivoted, e.g. trimmed and/or tilted.

[0034] The first and second actuators 40, 50 may be linear actuators such as hydraulic or pneumatic cylinders or electric actuators. In the present example, there are two trim actuators 50 connected in parallel (see FIG. 1).

[0035] As is indicated, the hatch 72 may be raised and lowered by means of the connection to the drive unit 10, and the hatch 72 may also be turned around a horizontal axis by means of the connection to the drive unit 10. In the depicted example, the hatch 72 is carried by the drive unit 10. FIG. 1 and FIG. 2 illustrate the hatch 72 in two separate angular orientations in which the hatch 72 may serve as a backrest.

[0036] As is to be apprehended, if an entire swim platform 70 is manoeuvrable by the drive unit 10, the entire swim platform 70 may be raised and lowered and turned by means of the present propulsion system 1. In some examples, the propulsion system may comprise two drive units 10, which together support one swim platform 70. As is to be apprehended, the entire swim platform 70 could be manoeuvred to serve as a backrest.

[0037] Referring in particular to FIG. 2, the drive unit 10 may comprise a drive platform interface 15 for connection to the hatch 72 of the swim platform 70. Correspondingly, the hatch 72 of the swim platform 70 may comprise a platform drive interface 75 for connection to the drive platform interface 15. In the present example, even though not shown in detail, the drive platform interface 15 and the platform drive interface 75 are configured to engage in a positive fit connection.

[0038] Now, the drive platform interface 15 and the platform drive interface 75 may be securely attached to one another such that the drive unit 10 carries hatch 72, as is disclosed in FIG. 1. In undepicted examples, the drive platform interface 15 may be securely attached to the entire swim platform 70 (lacking a hatch 72). The drive unit 10 is rigidly suspended by the transom bracket 20, and is thus capable of carrying the hatch 72 (or the entire swim platform 70).

[0039] As is schematically denoted (hollow dashed arrows) in FIG. 2, the drive platform interface 15 and the platform drive interface 75 may alternatively be configured for sliding engagement. Such a solution may be beneficial should the hatch 72 be hinged (not shown) to a stationary portion of the swim platform 70 or to the vessel 60. Especially when the drive unit 10 is suspended by the transom bracket 20 in a manner that allows a translatory and a rotatory movement of the drive unit 10 with respect to the vessel 60.

[0040] In the present example, even though not shown in detail, the drive platform interface 15 protrudes from the drive unit 10 towards the hatch 72. In some detail, the drive platform interface 15 may be adapted to stably support the hatch 72. For example, as may be understood from FIG. 1, the drive platform interface 15 may extend

along at least 2/3 of the width (port to starboard) of the hatch 72, or the drive platform interface 15 may support the hatch at two support points that are separated at least 2/3 of the width of the hatch 72.

[0041] The drive platform interface 15 may extend through a cowling or cover of the drive unit 10, and be secured to an internal, load-bearing, component of the drive unit 10, which internal component is in turn secured to the transom bracket 20. Typically, such a component is made of metal, and may form part of a chassis structure of the drive unit 10. Alternatively, the cowling of the drive unit 10 may be of sufficient structural strength to stably support the hatch 72. For example, the cowling may be made of metal or a fiber reinforced polymer, optionally with an internal strengthening rib-structure.

[0042] In undepicted examples where the drive unit 10 does not support a hatch 72 but instead a complete swim platform 70, the drive platform interface 15 of the drive unit 10 may be adapted to support swim platform 70 at multiple support points that are separated along the width of the swim platform 70.

[0043] The hatch 72 may be hinged to a stationary portion of the swim platform 70 and may be pivotable (about the hinge) between an open position and a closed position. When the drive unit 10 is tilted down, the hatch may be in its closed position and the swim platform may comprise an essentially flat upper side. Now, if the drive unit is tilted up, the hatch 72 may be pivoted to its open position. The propulsion system 1 and the swim platform 70 may be configured such that the drive unit 10 may be tilted up such that the entire drive unit 10 is located above the water line of the vessel 60. In this way, marine growth on the drive unit 10 may be minimised. The propulsion system 1 and the swim platform 70 may be configured such that the drive unit 10 may be tilted up such that the entire drive unit 10 is located above stationary portion of the swim platform 70. In this way, drive unit 10 inspection and service may be facilitated. For example, a person may stand or sit on the stationary portion of the swim platform 70 and visually inspect the drive unit 10.

[0044] The propulsion system 1 may, as is shown, comprise a connecting arm 30 that comprises a first pivot joint 31 and a second pivot joint 32. The connecting arm 30 may be elongated. The connecting arm 30 may comprise the respective pivot joints 31, 32 at its opposing ends. The first pivot joint 31 may be connected to the drive unit 10 and the second pivot joint 32 may be connected to the transom bracket 20.

[0045] The propulsion system 1 may be configured such that the drive unit 10 may be raised and lowered by pivoting the connecting arm 30 about the second pivot joint 32 that is connected to the transom bracket 20. Such a pivoting motion about the second pivot joint 32 (coaxial with tilt axis A) is illustrated by an arc-shaped double headed arrow in FIG. 2. Raising and lowering the drive unit 10, e.g. by pivoting the connecting arm 30 about the second pivot joint 32, may be referred to as tilting the drive unit 10. As is shown in FIG. 1, the tilt actuator 40

may be arranged to pivot the connecting arm 30 about its second pivot joint 32. One end of the tilt actuator 40 may be connected to the transom bracket 20 and an opposite end of the tilt actuator may be connected to the connecting arm 30, at a lever distance from the second pivot joint 32.

[0046] Referring to FIG. 1, the propulsion system 1 may be configured such that the drive unit 10 may be raised (i.e. tilted), by pivoting of the connecting arm 30 about the second pivot joint 32 (tilt axis A), to a position above swim platform 70. More precisely to a position that is vertically higher than a lowest position of the swim platform 70. The lowest position of the swim platform 70 may be a position in which the swim platform 70 is located during normal operation of the propulsion system, i.e. when the drive unit 10 is tilted down and propels the vessel 60 in water.

[0047] Referring in particular to FIG. 2, in the present propulsion system 1 the trim angle of the drive unit 10 is controlled by pivoting the drive unit 10 about the first pivot joint 31 (trim axis A1) of the connecting arm 30. The trim actuator 50 is arranged to pivot the drive unit 10 about the first pivot joint 31.

[0048] The present drive unit 10 comprises a support part 10a and a thrust part 10b. When the drive unit 10 is in its tilted down position, the support part 10a is the upper part and the thrust part 10b is the lower, or submerged, part. The support part 10a may also be at least partly submerged when the drive unit is tilted down. The thrust part 10b is rotatable with respect to the support part 10a about a steering axis B to direct the thrust of the drive unit 10. As is to be apprehended, when the thrust part 10b is rotated about the steering axis B, the thrust may be selectively directed in an essentially horizontal plane. The steering axis B is essentially vertical when the drive unit 10 is in a position to propel the vessel (the drive unit being completely or at least partially tilted down).

[0049] The drive unit 10 may comprise an electric propulsion motor, thus the propulsion system 1 may be an electric propulsion system.

[0050] Also disclosed are examples according to the following clauses:

1. A propulsion system (1) for a marine vessel (60) comprising a swim platform (70), the propulsion system (1) comprising

- a drive unit (10) and
- a transom bracket (20) for movably attaching the drive unit (10) to the marine vessel (60) such that the drive unit (10) may be moved between a lower position and a higher position,

wherein the drive unit (10) is adapted to be connected to the swim platform (70) such that at least a portion of the swim platform (70) is manoeuvrable by the drive unit (10) being moved between its lower and higher positions.

2. The propulsion system (1) of clause 1, configured such that at least a portion of the swim platform (70), optionally the entire swim platform (70), may be raised and lowered by means of the connection to the drive unit (10).

3. The propulsion system (1) of clause 2, configured such that at least a portion of the swim platform (70), optionally the entire swim platform (70), may be turned around a horizontal axis by means of the connection to the drive unit (10).

4. The propulsion system (1) of any preceding clause, wherein at least the portion of the swim platform (70) is carried by the drive unit (10).

5. The propulsion system (1) of clause 4, wherein the drive unit (10) forms the only load-bearing connection between the swim platform (70) and the marine vessel (60).

6. The propulsion system (1) of any preceding clause, wherein the drive unit (10) comprises a drive platform interface (15) for connection to the swim platform (70).

7. The propulsion system (1) of clause 6, wherein the drive platform interface (15) of the drive unit (10) is configured for connection to a platform drive interface (75) of the swim platform (70).

8. The propulsion system (1) of clause 7, wherein the drive platform interface (15) and the platform drive interface (75) are configured to engage in a positive fit connection.

9. The propulsion system (1) of clause 8, wherein the drive platform interface (15) and the platform drive interface (75) are configured for sliding engagement.

10. The propulsion system (1) according to any of clauses 7 to 9, wherein the drive platform interface (15) protrudes from the drive unit (10) towards the swim platform (70) and/or the platform drive interface (75) protrudes from the swim platform (70) towards the drive unit (10).

11. The propulsion system (1) of clause 10, wherein the drive platform interface (15) protrudes from the drive unit (10) and is received in a platform drive interface (75) in the form of a slot, or the platform drive interface (75) protrudes from the swim platform (70) and is received in a drive platform interface (15) in the form of a slot.

12. The propulsion system (1) of any preceding clause, comprising a connecting arm (30) that comprises a first pivot joint (31) adapted to be connected to the drive unit (10) and a second pivot joint (32) adapted to be connected to the transom bracket (20).

13. The propulsion system (1) of clause 12, configured such that the drive unit (10) may be raised and lowered by pivoting the connecting arm (30) about the second pivot joint (32) of the connecting arm (30).

14. The propulsion system (1) of clause 13, configured such that the drive unit (10) may be raised, by pivoting of the connecting arm (30) about its second

pivot joint (32), to a position above the water line of the marine vessel (60).

15. The propulsion system (1) clause 13, configured such that the drive unit (10) may be raised, by pivoting of the connecting arm (30) about its second pivot joint (32), to a position vertically higher than a portion of the swim platform (70).

16. The propulsion system (1) according to any of clauses 12 to 15, comprising a first actuator (40) that is arranged to pivot the connection arm (30) about the second pivot joint (32).

17. The propulsion system (1) according to any of clauses 12 to 16, configured such that a thrust angle of the drive unit (10) may be controlled by pivoting the drive unit (10) about the first pivot joint (31) of the connecting arm (30).

18. The propulsion system (1) of clause 17, comprising a second actuator (50) that is arranged to pivot the connection arm (30) about the first pivot joint (31).

19. The propulsion system (1) of any preceding clause, wherein the swim platform (70) comprises a hatch (72) to which the drive unit (10) is adapted to be connected.

20. The propulsion system (1) of clause 19, wherein the portion of the swim platform (70) that is manoeuvrable by the drive unit (10) is the hatch (72).

21. The propulsion system (1) of clause 20, wherein the hatch (72) is carried by the drive unit (10).

22. The propulsion system (1) of clause 19, wherein the hatch (72) is hinged to the swim platform (70) or to the marine vessel (60).

23. The propulsion system (1) of clause 22, wherein the hatch (72) and the drive unit (10) are configured for sliding engagement.

24. The propulsion system (1) of any preceding clause, wherein the drive unit (10) comprises a support part (10a) and a thrust part (10b), wherein the thrust part (10b) is rotatable with respect to the support part (10a) about a steering axis (B) to direct the thrust of the drive unit (10).

25. The propulsion system (1) of clause 24, wherein the support part (10a) is adapted to be connected to the swim platform (70).

26. The propulsion system (1) of clause 24 or 25, wherein the support part (10a), in relation to the vessel (60), is only movable between its lower and higher positions.

27. The propulsion system (1) of any preceding clause, configured such that the drive unit is tiltable about a tilt axis (A).

28. The propulsion system (1) of any preceding clause, configured such that the drive unit is trimmable about a trim axis (A1) that is separate from the tilt axis (A).

29. The propulsion system (1) of any preceding clause, comprising two drive units (10), both drive units being adapted to be connected to the swim platform (70).

30. A marine vessel (60) comprising a propulsion system (1) according to any preceding clauses.

31. The marine vessel (60) of clause 30, comprising a swim platform with a hatch (72), wherein the drive unit (10) is adapted to be connected to the hatch (72) such that the hatch (72) is manoeuvrable by the drive unit (10) being moved between its lower and higher positions.

[0051] The terminology used herein is for the purpose of describing particular aspects only and is not intended to be limiting of the disclosure. As used herein, the singular forms "a," "an," and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items. It will be further understood that the terms "comprises," "comprising," "includes," and/or "including" when used herein specify the presence of stated features, integers, actions, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, actions, steps, operations, elements, components, and/or groups thereof.

[0052] It will be understood that, although the terms first, second, etc., may be used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another. For example, a first element could be termed a second element, and, similarly, a second element could be termed a first element without departing from the scope of the present disclosure.

[0053] Relative terms such as "below" or "above" or "upper" or "lower" or "horizontal" or "vertical" may be used herein to describe a relationship of one element to another element as illustrated in the Figures. It will be understood that these terms and those discussed above are intended to encompass different orientations of the device in addition to the orientation depicted in the Figures. It will be understood that when an element is referred to as being "connected" or "coupled" to another element, it can be directly connected or coupled to the other element, or intervening elements may be present. In contrast, when an element is referred to as being "directly connected" or "directly coupled" to another element, there are no intervening elements present.

[0054] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this disclosure belongs. It will be further understood that terms used herein should be interpreted as having a meaning consistent with their meaning in the context of this specification and the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0055] It is to be understood that the present disclosure is not limited to the aspects described above and illustrated in the drawings; rather, the skilled person will recognize that many changes and modifications may be made within the scope of the present disclosure and appended claims. In the drawings and specification, there have been disclosed aspects for purposes of illustration only and not for purposes of limitation, the scope of the disclosure being set forth in the following claims.

ognize that many changes and modifications may be made within the scope of the present disclosure and appended claims. In the drawings and specification, there have been disclosed aspects for purposes of illustration only and not for purposes of limitation, the scope of the disclosure being set forth in the following claims.

Claims

1. A propulsion system (1) for a marine vessel (60) comprising a swim platform (70), the propulsion system (1) comprising

- a drive unit (10) and
- a transom bracket (20) for movably attaching the drive unit (10) to the marine vessel (60) such that the drive unit (10) may be moved between a lower position and a higher position,

wherein the drive unit (10) is adapted to be connected to the swim platform (70) such that at least a portion of the swim platform (70) is manoeuvrable by the drive unit (10) being moved between its lower and higher positions.

2. The propulsion system (1) of claim 1 configured such that at least a portion of the swim platform (70), optionally the entire swim platform (70), may be raised and lowered by means of the connection to the drive unit (10).

3. The propulsion system (1) of claim 1 or 2, wherein at least the portion of the swim platform (70) is carried by the drive unit (10).

4. The propulsion system (1) of claim 3, wherein the drive unit (10) forms the only load-bearing connection between the swim platform (70) and the marine vessel (60).

5. The propulsion system (1) of any preceding claim, wherein the drive unit (10) comprises a drive platform interface (15) for connection to the swim platform (70).

6. The propulsion system (1) of claim 5, wherein the drive platform interface (15) of the drive unit (10) is configured for connection to a platform drive interface (75) of the swim platform (70).

7. The propulsion system (1) of claim 6, wherein the drive platform interface (15) and the platform drive interface (75) are configured to engage in a positive fit connection.

8. The propulsion system (1) of claim 7, wherein the drive platform interface (15) and the platform drive

interface (75) are configured for sliding engagement.

9. The propulsion system (1) of any preceding claim, comprising a connecting arm (30) that comprises a first pivot joint (31) adapted to be connected to the drive unit (10) and a second pivot joint (32) adapted to be connected to the transom bracket (20), wherein the drive unit (10) may be raised to a position vertically higher than a portion of the swim platform (70) by pivoting the connecting arm (30) about the second pivot joint (32) of the connecting arm (30). 5 10
10. The propulsion system (1) of claim 9, comprising a first actuator (40) that is arranged to pivot the connection arm (30) about the second pivot joint (32). 15
11. The propulsion system (1) of claim 9 or 10 configured such that a thrust angle of the drive unit (10) may be controlled by pivoting the drive unit (10) about the first pivot joint (31) of the connecting arm (30). 20
12. The propulsion system (1) of claim 11, comprising a second actuator (50) that is arranged to pivot the connection arm (30) about the first pivot joint (31). 25
13. The propulsion system (1) of any preceding claim, wherein the swim platform (70) comprises a hatch (72) to which the drive unit (10) is adapted to be connected, and wherein the portion of the swim platform (70) that is manoeuvrable by the drive unit (10) is the hatch (72). 30
14. The propulsion system (1) of claim 13, wherein the hatch (72) is carried by the drive unit (10). 35
15. The propulsion system (1) of any preceding claim, wherein the drive unit (10) comprises a support part (10a) and a thrust part (10b), wherein the thrust part (10b) is rotatable with respect to the support part (10a) about a steering axis (B) to direct the thrust of the drive unit (10). 40
16. A marine vessel (60) comprising a propulsion system (1) according to any preceding claims. 45

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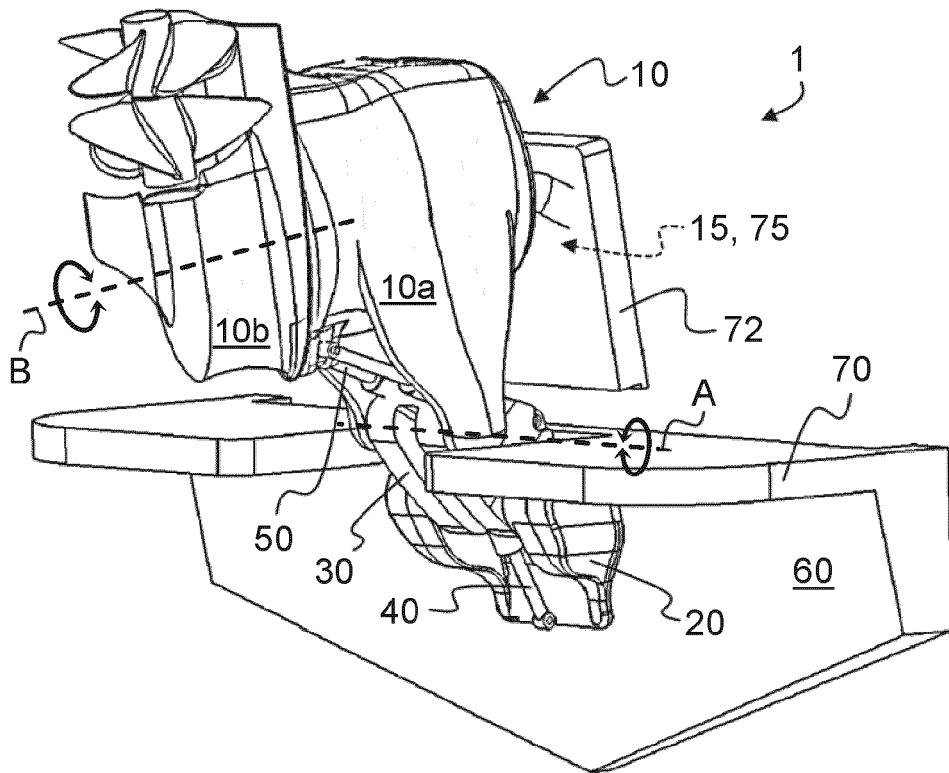


FIG. 1

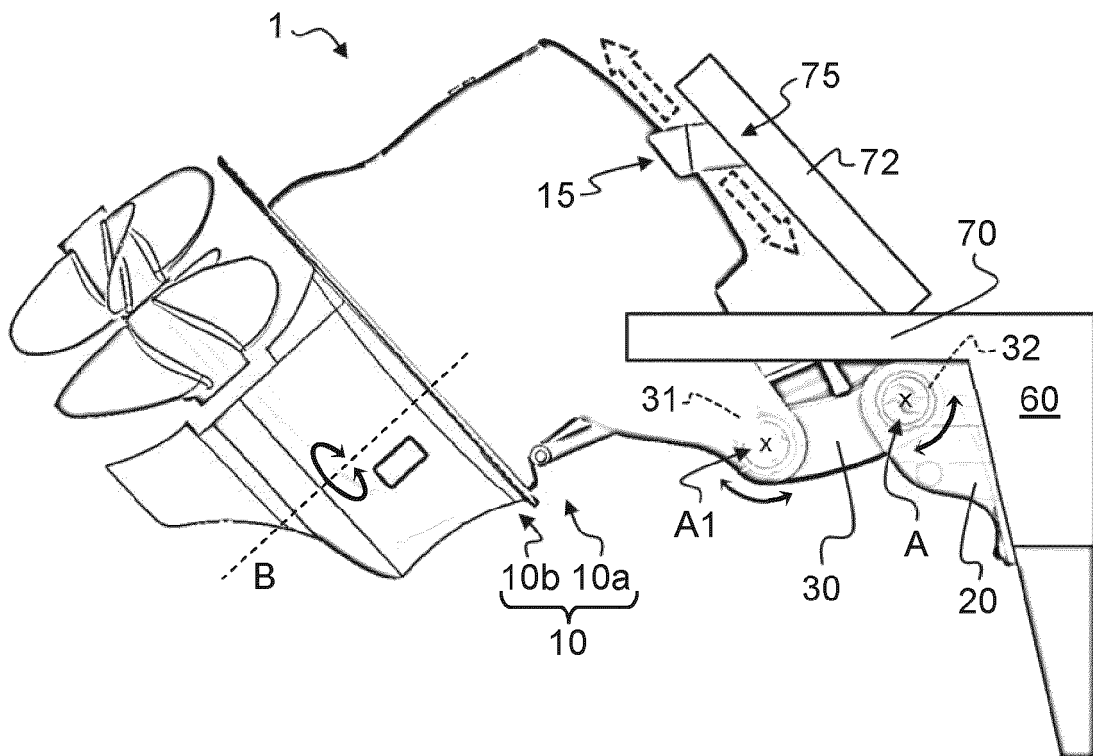


FIG. 2



EUROPEAN SEARCH REPORT

Application Number

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Place of search The Hague		Date of completion of the search 12 September 2024	Examiner Freire Gomez, Jon
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