Claims

1. A mooring device for mooring a ship, the mooring device having a moored state, in which it engages the ship, and a non-moored state in which it does not engage the ship, the mooring device comprising:

- a base;

- a movable arm, fixed with respect to the base with a first end, a second, opposite end of the arm being movable with respect to the base between a retracted position, in which the second end is relatively close to the first end and an extended position, in which the second end is relatively far from the first end;

- a connector carried by the arm, the connector having an engaged state, in which it engages an object for mooring, such as the hull of a ship, and a disengaged state, in which it does not engage the object; and

- a distance keeping system configured for keeping a minimum and non-zero distance between the base and the object engaged by the connector, wherein the distance keeping system is integrated with the movable arm.

2. The mooring device according to the previous claim, wherein the mooring device further comprises means for providing a force in an alongships direction between the base and the connector.

3. The mooring device according to the previous claim, wherein the means for providing a force in the alongships direction comprise an actuator for rotation the arm around a vertical axis.

4. The mooring device according to any of the preceding claims, wherein the mooring device, optionally the means for providing force in the alongships direction, comprises:

- a winch;

- a tensile element having a first end engaged by the winch and a second, opposite end fixed with respect to the second end of the arm and/or the connector.

5. The mooring device according any of the preceding claims, wherein the distance keeping system comprises:

- at least one actuator for moving the movable arm.

6. The mooring device according to the previous claim, comprising a such actuator having one end fixed with respect to the base, and another, opposite end fixed with respect to the arm, said actuator being arranged for providing a pushing force between the base and the arm.

7. The mooring device according to the previous claim, wherein said actuator is an hydraulic actuator.

8. The mooring device according to any of claims 5 - 7, wherein the distance keeping system comprises:

- a controller operatively connected to the at least one actuator for controlling the at least one actuator,

wherein in the moored state, the controller is configured to control the arm by controlling the at least one actuator, in order to maintain a distance between the first and second end of the arm.

9. The mooring device according to any of the preceding claims including the winch, wherein the winch is an automatic winch, which is configured to keep a tension on the tensile element at least in the moored state.

10. The mooring device according to claims 8 and 9, wherein the controller is further operatively connected to:

- the winch for controlling the winch; and/or
- the means for providing the alongships direction, for controlling said means.

11. The mooring device according to any of claims 8 - 10, further comprising a position determination system operatively connected to the controller, configured for determining a position of the second end of the arm and communicating to the controller said determined position.

12. The mooring device according to the previous claim, wherein the controller is configured to control the winch and/or the means for providing force in the alongships force on the basis of the determined position of the arm.

13. The mooring device according to claim 11 or 12, wherein the controller is configured to control the at least one actuator on the basis of the determined position of the arm.

14. The mooring device according to any of the preceding claims, wherein the tensile element is led to an engaging position fixed with respect to the base at a distance from the arm.

15. The mooring device according to the previous claim, further comprising a pulley at the engaging position.

16. The mooring device according to claim 14 or 15, wherein the winch is arranged closer to the arm than the engaging position.

17. The mooring device according to any of the preceding claim, wherein the connector comprises a latching element for latching onto a surface in the engaged state, for example a vacuum pad or a magnetic mooring pad.

18. The mooring device according to any of the preceding claims, wherein the arm is rotatable with respect to the base around two mutually perpendicular axes which are both perpendicular to a local axis of the arm at its first end.

19. The mooring device according to the previous claim, wherein the distance keeping system comprises actuators configured for actuating rotation of the arm around said two mutually perpendicular axes, wherein optionally the actuators are operatively connected to the controller.

20. The mooring system, comprising at least two mooring devices according to any of the preceding claims, the bases of which are fixed with respect to each other, or which share a base.

21. The mooring system according to the previous claim, wherein tensile elements of the at least two mooring systems are led to engaging positions on opposite sides of the arms.

22. The mooring system according to any of the preceding system claims, wherein the at least two mooring devices, in particular the movable arms thereof, are operatively connected for being controlled cooperatively.