

(19)



(11)

EP 2 669 181 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
24.04.2019 Bulletin 2019/17

(51) Int Cl.:
B63H 1/18 (2006.01) **B63H 5/125 (2006.01)**
B63H 5/16 (2006.01)

(21) Application number: **12382217.3**

(22) Date of filing: **30.05.2012**

(54) Transmission device for ships

Getriebe für Schiffe

Dispositif de transmission pour navires

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(43) Date of publication of application:
04.12.2013 Bulletin 2013/49

(73) Proprietor: **Talleres Luis Piñeiro, S.L.**
15938 Boiro-A Coruña (ES)

(72) Inventor: **Piñeiro Rodriguez, Luis Santiago**
15938 Boiro-A Coruña (ES)

(74) Representative: **Urizar Anasagasti, Jesus Maria**
IPAMARK, S.L.
Paseo de la Castellana 72 1°
28046 Madrid (ES)

(56) References cited:
ES-A1- 2 213 421 ES-U- 257 369
ES-U- 1 064 653 US-A- 5 931 710

EP 2 669 181 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

Object of the invention

[0001] The present invention as indicated in its own title relates to a transmission device of the movement from the engine to the pusher propeller, of the type of those comprising a driving axis which mounts the propeller on the opposite end, which has an intermediate joint that allows placing said propeller below the keel of the ship in normal operating situation, or raising it when the ship moves through shallow waters or with seaweeds, rocks or other types of shallow obstacles.

Background of the invention

[0002] Currently there are propulsion systems installed in a hole opened in the hull of the ship that have means of suspension or lifting of the propeller when required by the navigation. Documents ES-U257369, ES-1010662 and ES-2213421 all of them relate to a device with these characteristics, the drive of which is effected by means of a cylinder included in said hole and therefore immersed in the water.

[0003] ES 1 064 653 is considered to be the closest prior art and discloses a transmission device for ships comprising all the features of the preamble of independent claim 1.

Description of the invention

[0004] The present invention includes a series of modifications to this device providing several notable practical advantages.

[0005] In a transmission device according to claim 1, the C-shape support arm has its top and bottom wings hinged, with several fixation holes with various inclination angles, which allow to regulate the final position of the cavitation plate for placing it at the most suitable position in each ship, wherein the hinge linking the support arm with the stern of the boat consists of hinged plates orthogonally located with respect to the axis, that prevent the swinging or lateral displacement of the axis, regardless of the position in which it is placed.

[0006] The lifting mechanism of the axis of the propeller and rudder consists of a hinge, fixed at the stern of the boat, inside of which is mounted an actuating cylinder the compression and relaxation extreme positions of which correspond respectively to the folding and opening of the hinge, or what is the same the lifting or lowering of the axis. This arrangement allows that the propeller is not immersed in the water and therefore its easy access without having to remove the ship from the water, while as the hinge has two separate hinged plates, orthogonal with respect to the axis, there is not any lateral movement in any of the positions of the axis, which provides greater resistance and robustness to the device.

[0007] In this transmission device the rudder is mount-

ed behind the pusher propeller and both are located in a C-shape support piece, the vertical plot of which is orientated towards the stern of the boat, such that it protects the rudder and the propeller from the objects or obstacles on the bottom. The axis of the rudder is mounted on the 3 ends of said C-shape piece, being rotated from the upper zone through an actuating cylinder that is attached to the upper part of the cavitation plate that protects the top of the propeller. According to a feature of this invention this support piece has regulation means that allow establishing the ideal position of the cavitation plate with the suitable horizontality and height.

[0008] The transmission axis is mounted on an axial channel existing in that of the ship that goes from the stern towards the central zone below the center line wherein said axis moves vertically; such that the starboard and port swinging is prevented, both when the boat is stopped and when it is moving and also it stabilizes the course by absorbing the impacts of the sea and the effects of wind on navigation, preventing the constant oscillations of the rudder.

[0009] The device of the present invention allows a single person to navigate through shallow waters and to perform the usual fishing and shellfish harvesting tasks since that if the net or any object get caught in the propeller, or the rudder, he can turn off the engine and manually remove the element that caused the blockage from the cavitation plate.

Description of the figures

[0010] To complement the description that is being carried out and in order to facilitate the understanding of the features of the invention, the present specification is accompanied by a set of drawings wherein, with illustrative character and without limitation, the following has been represented:

Figure 1 shows a perspective general view of this device.

Figures 2 and 3 respectively represent two side and front elevational views from the boat, of said device. Figure 4 shows a perspective view from a frontal angle.

Figure 5 represents a side elevational detailed view of the support of the end of the axis wherein the propeller and the rudder are mounted.

Preferred embodiment of the invention

[0011] As it can be seen in the referenced figures the device of the invention relates to a mechanical transmission device, in particular a device that transmits the engine torque from the engine or from the transmission (1) to the pusher propeller of a ship. This device essentially comprises a drive axle (3) mounting on the end the pusher propeller (4); said axis emerges from the middle of the boat and runs along a channel in the bottom of the ship

to the stern, having an intermediate joint (2) in the area near which it comes out of the hull of the ship allowing its abatement until placing said propeller (4) below the keel of the ship in normal operating situation (see figures 2 and 3), or raised when the ship moves through shallow waters or with seaweeds, rocks or other types of shallow obstacles (see Figure 1).

[0012] On the end, said drive axle (3) has a support arm (5) that adopts an elevation in C configuration, wherein the vertical plot is located towards the stern of the ship and incorporates an intermediate hub (13) through which said shaft (3) passes which incorporates the propeller (4) on the end, in a way such that it is situated in the interior of this support (5), protected during the forward movement of the boat from seaweeds or other obstacles that might be present on its course. The support arm (5) is subsequently closed through the rotation axis (7) of the rudder (6) and above through a cavitation plate (9), on which the driving mechanism of the same is located, usually located on the cavitation plate (9) that protects the propeller at the top. Therefore, also the rudder is shielded from being affected by the obstacles that float or that are in the path of the ship.

[0013] The top of the support arm (5) has a V-configuration, seen from behind, articulating the end (10) of its wings in a hinge (8), located on the stern of the ship, through a hinged plate (12). Said hinge (8) is actuated by a cylinder (11) which carries out the extension and compression stroke of the same, lowering or raising the axis-propeller-rudder-cavitation plate assembly inside the water. Such and as shown in the figures the hinge (8) consists of hinged plates, orthogonally located with respect to the axis (1) preventing the swinging or lateral displacement of the axis, regardless of the position in which it is placed.

[0014] The C-shape support arm (5) has its upper and lower wings hinged, with at least one couple of two fixation holes (14-15-16) among themselves and with respect to the rudder axis (7). Depending on how the fixation between these hinged parts is established and at what inclination angles they are set, the final position of the cavitation plate (9) is regulated, in order to adopt a suitable position in each ship, aligned with the keel or waterline of the ship.

[0015] Once sufficiently described the nature of the invention, as well as an example of preferred embodiment, it is stated for all useful purposes that the materials, shape, size and arrangement of the elements described above may be modified, provided that it does not involve an alteration of the essential features of the invention that are claimed below:

Claims

1. Transmission device for ships, comprising a drive axle (3) of a pusher propeller (4), which emerges from the middle zone of the boat and runs along a

channel in the bottom of the ship to the stern, having an intermediate joint (2) allowing to locate said propeller below the keel of the ship under normal operating situation, or to raise it when the ship moves through shallow waters or with seaweeds, rocks or other shallow obstacles, wherein said drive axle (3) has behind the pusher propeller a C-configuration support arm (5), the vertical plan of which being situated towards the stern of the ship and incorporating a hub through which said drive axle (3) passes said hub incorporating the propeller (4) on the end, in a way such that said propeller is situated in the interior of said support arm (5), wherein said support arm (5) is subsequently closed through the rotation axis (7) of a rudder (6) and from above through a cavitation plate (9) above which a hinge (8) is articulated on, the other end of said hinge being fixed by means of a hinged plate (12) to the stern of the ship, said hinge (8) being actuated by a cylinder (11) that carries out the extension and compression stroke of the same, lowering or raising the axis-propeller, rudder and cavitation plate assembly inside the water;

characterized in that the C-shape support arm (5) has its top and bottom wings hinged, with several fixation holes (15) with various inclination angles, which allow to regulate the final position of the cavitation plate (9) for placing it at the most suitable position in each ship, wherein the hinge (8) linking the support arm (5) with the stern of the boat consists of hinged plates orthogonally located with respect to the axle (3), that prevent the swinging or lateral displacement of the axle, regardless of the position in which it is placed.

Patentansprüche

1. Getriebevorrichtung für Schiffe, umfassend eine Antriebsachse (3) eines Schubpropellers (4), die aus der mittleren Zone des Bootes austritt und entlang eines Kanals im Boden des Schiffes zum Heck hin verläuft, mit einem Zwischengelenk (2), das es ermöglicht, den Propeller unter dem Kiel des Schiffes unter normaler Betriebssituation zu positionieren, oder um ihn anzuheben, wenn sich das Schiff durch flache Gewässer oder mit Algen, Steinen oder anderen flachen Hindernissen bewegt, wobei die Antriebsachse (3) hinter dem Schubpropeller einen C-Tragarm (5) aufweist, dessen vertikale Ebene sich zum Heck des Schiffes hin befindet und eine Nabe aufweist, durch die die Antriebsachse (3) die Nabe passiert, wobei sich der Propeller (4) am Ende befindet, derart, dass der Propeller im Inneren des Tragarms (5) angeordnet ist, wobei der Tragarm (5) anschließend durch die Drehachse (7) eines Ruders (6) und von oben durch eine Kavitationsplatte (9) geschlossen wird, über der ein Scharnier (8) angelenkt ist, wobei das andere Ende des Scharniers mit-

tels einer Klappplatte (12) am Heck des Schiffes befestigt ist, wobei das Scharnier (8) durch einen Zylinder (11) betätigt wird, der den Streck- und Kompressionshub desselben ausführt, wobei die Achse-Propeller-, Ruder- und Kavitationsplattenanordnung innerhalb des Wassers abgesenkt oder angehoben wird;

dadurch gekennzeichnet, dass der C-förmige Tragarm (5) seine oberen und unteren Flügel klappbar aufweist, mit mehreren Befestigungslöchern (15) mit unterschiedlichen Neigungswinkeln, die es ermöglichen, die Endposition der Kavitationsplatte (9) zum Platzieren in der am besten geeigneten Position in jedem Schiff zu regulieren, wobei das Scharnier (8), das den Tragarm (5) mit dem Heck des Bootes verbindet, aus orthogonal zur Achse (3) angeordneten Klappplatten besteht, die das Schwingen oder die seitliche Verschiebung der Achse verhindern, unabhängig von der Position, in der sie platziert ist.

des plaques articulées orthogonalement situées par rapport à l'axe (3), qui empêchent le déplacement oscillant ou latéral de l'essieu, indépendamment de la position dans laquelle il est placé.

Revendications

1. Dispositif de transmission pour bateaux, comprenant un essieu moteur (3) d'une hélice propulsive (4), qui émerge de la zone médiane du bateau et longe un canal sur la partie inférieure du bateau à l'arrière, ayant un joint intermédiaire (2) permettant de situer ladite hélice en dessous de la quille du bateau dans une situation opérationnelle normale, ou pour la lever lorsque le bateau se déplace dans des eaux peu profondes ou avec des algues, roches ou autres obstacles peu profonds, dans lequel ledit essieu moteur (3) a derrière l'hélice propulsive un arbre de support avec une configuration en C (5), dont le plan vertical est situé vers l'arrière du bateau et incorpore un moyeu par lequel ledit essieu moteur (3) passe ledit moyeu incorporant l'hélice (4) à l'extrémité, de sorte que ladite hélice est située à l'intérieur dudit bras de support (5), dans lequel ledit bras de support (5) est ultérieurement fermé par l'axe de rotation (7) d'un gouvernail (6) et depuis la partie supérieure par une plaque de cavitation (9) au-dessus de laquelle une charnière (8) est articulée, l'autre extrémité de ladite charnière étant fixée au moyen d'une plaque articulée (12) à l'arrière du bateau, ladite charnière (8) étant actionnée par un cylindre (11) qui porte la course d'extension et de compression de ce dernière, baissant ou levant l'ensemble axe-hélice, gouvernail et plaque de cavitation dans l'eau ;
caractérisé en ce que le bras de support en forme de C (5) a ses ailes supérieure et inférieure articulées, avec plusieurs orifices de fixation (15) avec plusieurs angles d'inclinaison, qui permettent de régler la position finale de la plaque de cavitation (9) pour la placer à la position la plus adaptée dans chaque bateau, dans lequel l'articulation (8) reliant le bras de support (5) avec l'arrière du bateau consiste en

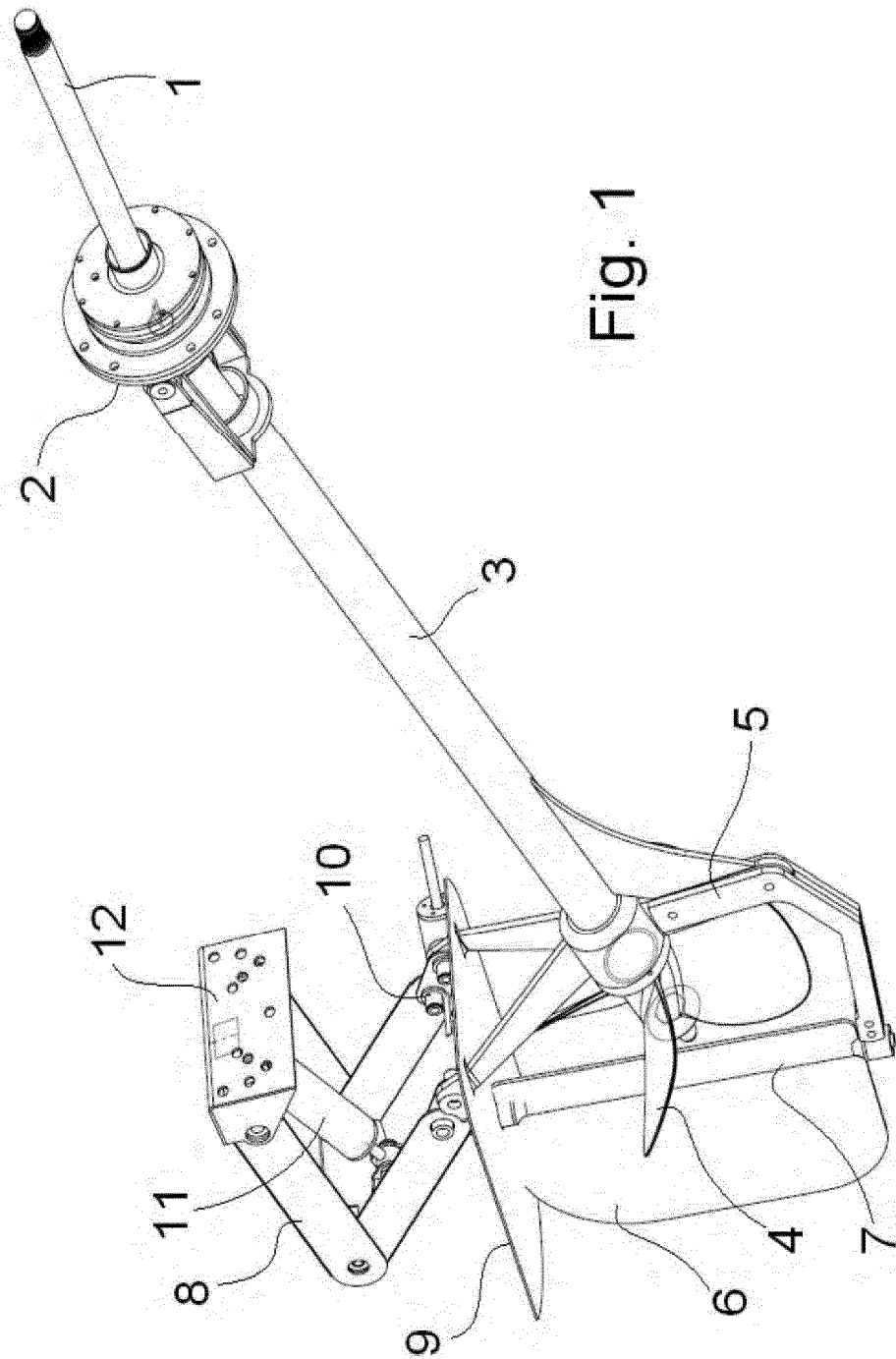


Fig. 1

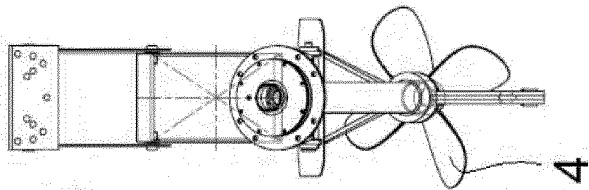


Fig. 3

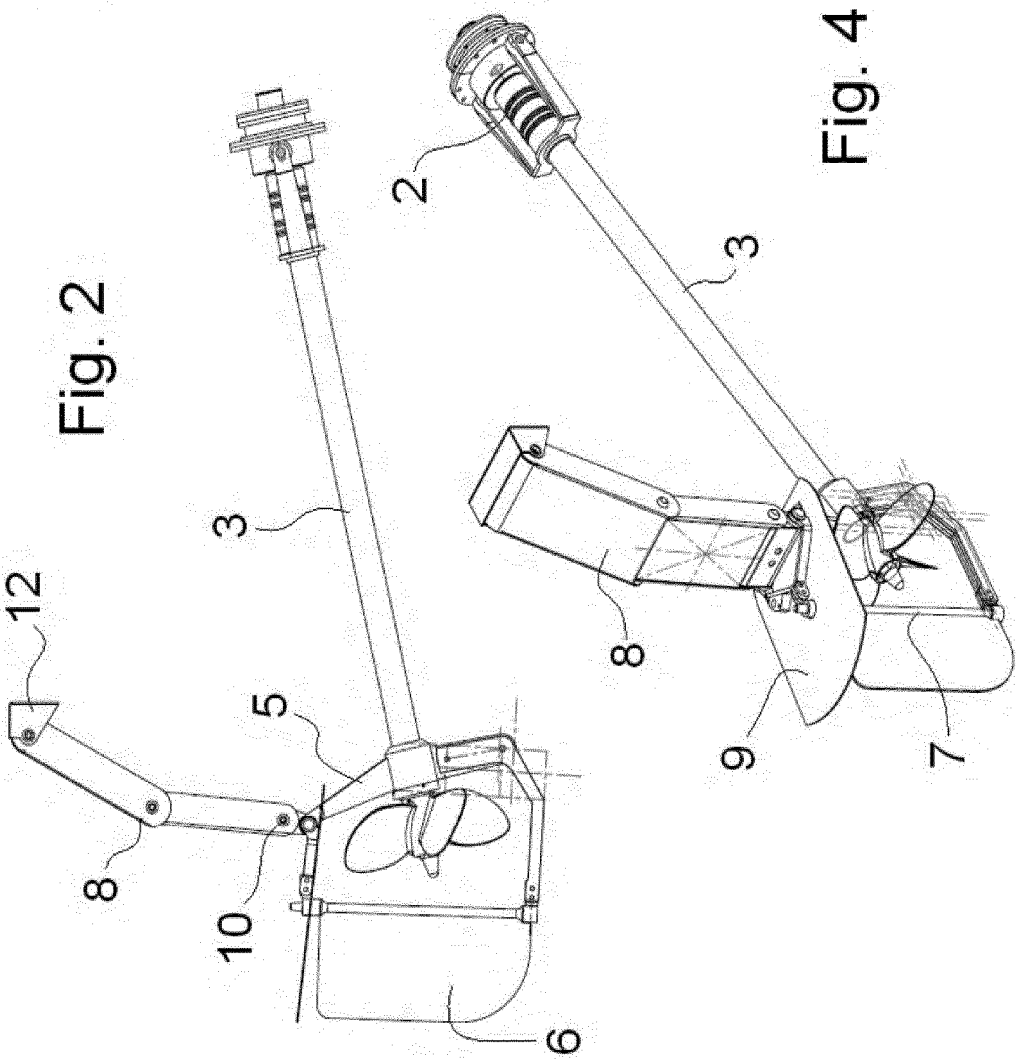
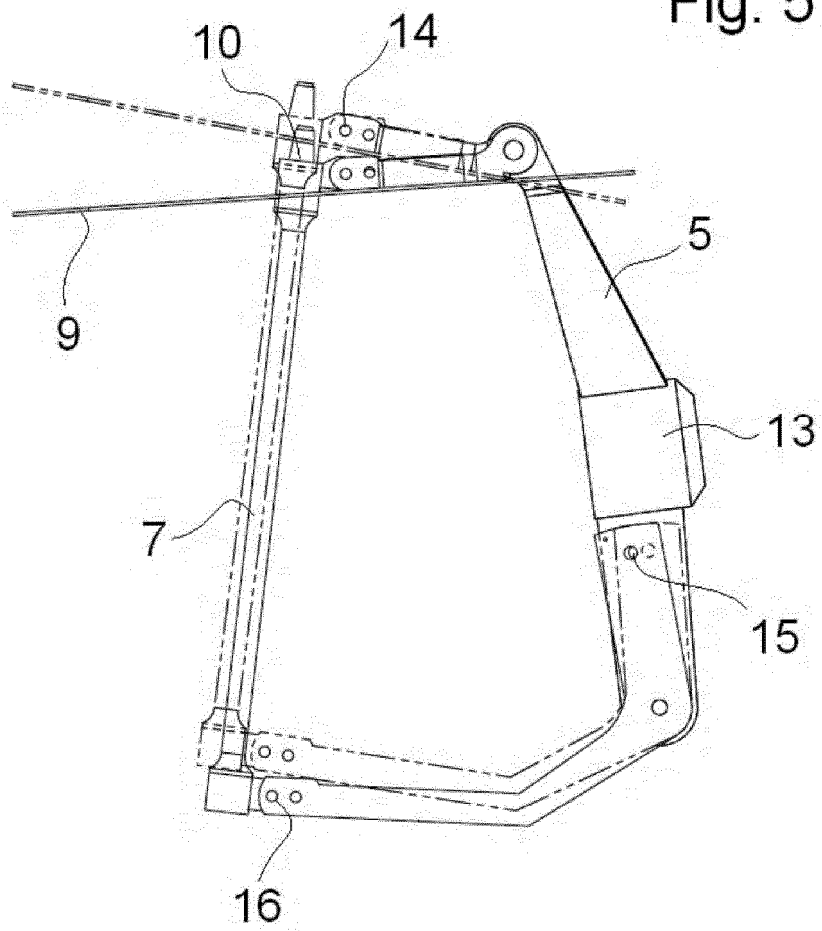


Fig. 4

Fig. 5



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- ES 257369 U [0002]
- ES 1010662 [0002]
- ES 2213421 [0002]
- ES 1064653 [0003]