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(12) # EUROPEAN PATENT APPLICATION

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(54) **Sail assist unit.**

(57) This invention provides new and useful means for raising, lowering and furling and setting sails on vessels, from the smallest sail-boats to vessels of any suitable length. The invention consists of the combination of a rotatable mast (5) on which are provided by means two slidable collars (3) connected to a hydraulic cylinder. The ends of two conventional struts (4) are attached by means to the sides of each collar, the other ends of the two sets of struts (4) are attached by means to the appropriate sides of the arms of two yardarms (1), the two yardarms being hingedly attached by means (2) at the centers thereof. A sail is conventionally disposed and adapted to fit on the top and bottom hinged yardarms. As the collars around the mast are actuated by the hydraulic cylinder to move toward each other on the mast, the struts attached to the collars move inward toward the mast, thus drawing the hinged yardarms in towards the mast and folding or furling the sail, attached to the said yardarm in, towards and against the mast. A sleeve, disposed and adapted to be pulled up by conventional means from the bottom of the mast toward the top of the mast is provided. This sleeve is disposed and adapted to be pulled up and fit over the folded yardarms, struts and the furled sail, thus forming a compact protected unit around the mast when the sail is furled. The sail may be quickly unfurled and set by removing the sleeve and actuating the collars by the hydraulic cylinder to move apart from each other. It may be seen that the operation of this invention could be automated by micro-processor means or, in case of mechanical or electrical failure and in emergency, the collars could be actuated by conventional rope and pulley manual means, in order to furl and unfurl the sail.

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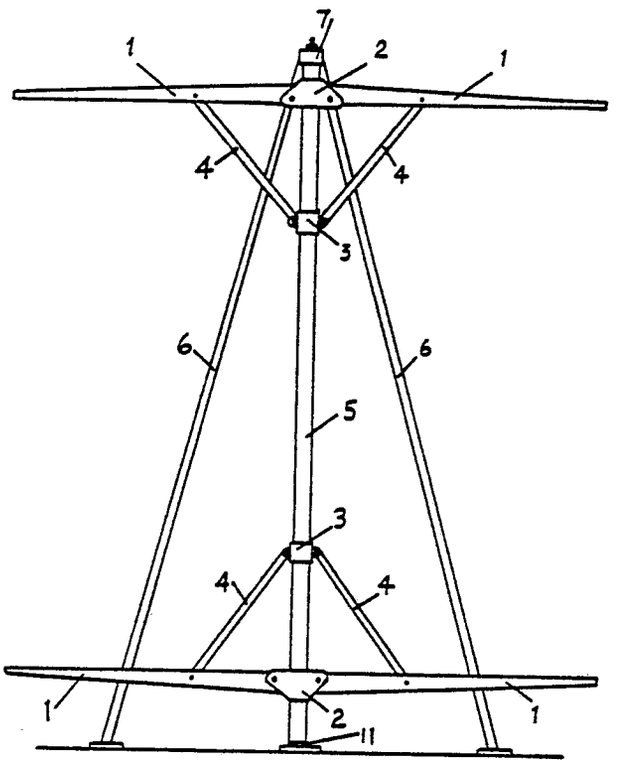
FIG. 1



SAIL ASSIST UNIT

This invention relates to novel means for raising, lowering and furling sails on all vessels from the smallest sail-boats to vessels of any suitable length. All other sails on the market today suffer from the following defects, namely, some are labour intensive, that is, they require additional manpower with the attendant problems. Others depend on complicated and highly technical devices to operate their sails. The high initial costs and difficult maintenance problems and failures in a marine environment of these devices make them difficult, if not impossible, for the small vessel owner to use same on his vessel. Other sail units require too much working of the sail, either by winch means or the necessary presence of complicating rigging. This present invention overcomes the past problems by supplying and simplifying the method of furling and settling the fabric forming the sail. This lends itself to being installed in a variety of configurations, namely, mast supported by a tri-pod structure, free standing masts or a mast guyed with wires or a mast supported by any other suitable means. It also lends itself to being remotely controlled from the wheel house or any other appropriate location on the vessel or it can be fully automated using a micro-processor.

The folding mechanism is simple and rugged as opposed to other sail devices utilizing parts with closely machined tolerances, which provide many mechanical failures and problems with attendant danger to crew and attendants.

In this present invention, many of the above difficulties are eliminated as follows:

The present invention consists of a rotatable mast, to which are attached upper and lower yardarms, hinged at the centers, supported by two struts each, which struts are attached to the sliding collars. In this disclosure, two legs extend from a cap on the top of the mast to the deck of the ship. The two collars are connected to a hydraulic cylinder and the two collars are also connected to the four struts. As the hydraulic cylinder moves, it draws the sliding collars together, the struts, attached to the sliding collars and to the yardarms at the other end, are pulled together, thus drawing the two upper yardarms and the two lower yardarms tightly against the mast. A protective sleeve may be pulled up and over the furled sail. This sleeve would serve to pull the sail tightly against the mast.

In the drawings illustrating the embodiments of my invention:

FIGURE 1: illustrates a plan view of this invention in a tri-pod configuration, showing the yardarms and the struts in extended position.

FIGURE 2: illustrates a lateral view of Figure 1.

FIGURE 3: illustrates a front view of the invention, showing the yardarms and the struts in closed position and showing a protective sleeve around the yardarms and struts.

FIGURE 4: illustrates details of nylon bushings at the top and bottom of rotating mast to facilitate easy rotation.

In the drawings, Figure 1, the number 1 illustrates the top and bottom and hinged yardarms. The number 2 illustrates a conventional hinging mechanism. The number 3 illustrates two sliding collars to allow struts 4 to push or pull the yardarms 1 to desired position on the mast 5. The number 6 illustrates the legs of the tri-pod. The number 7 illustrates a cap fitting over the top of the rotatable mast 5.

In Figure 2, the number 8 illustrates a hydraulic cylinder attached to the lower collar 3 by means and to a spacer bar 8a. The number 9 illustrates a tiller bar welded to a rotating mast 5 to facilitate the rotating of the mast 5.

In Figure 3, the number 10 illustrates a protective sleeve, disposed over the struts 4 and the yardarms 1, and the sail, (not shown), when in closed position.

In Figure 4, the number 11 illustrates a nylon bushing inside the cap 7 fitting over the top of the rotating mast 5. The number 12 illustrates a threaded bolt welded to the top end of plate 13 on the mast 5. The number 14 illustrates a nut fitting over the threaded bolt 12. The number 15 illustrates another mounting plate on the deck of the ship or vessel. The number 16 illustrates an access port to attach another nut 14, (not shown), to threaded bolt 12 welded to mounting plate 15 on the deck.

The mode of use and the operation of this invention are as follows:

The mast 5, on which are disposed and adapted the two collars 3, attached to the struts 4, which are attached to the yardarms 1, is affixed to the deck of the ship, Figure 4. The cap 7 is placed over the mast 5 and the two legs 6 are attached to cap 7 and extended to the deck in a tri-pod position where they are affixed to the deck by conventional means.

A sail, not shown, is conventionally attached to the top hinged yardarm 1 and to the bottom hinged yardarm 1. The invention is then ready to be used.

The sail may be furled by actuating the hydraulic cylinder 8 by conventional means, which brings the two collars 3 together on the mast 5, thus drawing the two struts 4 into a closed position, which automatically draws the two hinged yardarms 1 at the top and at the bottom of the mast 5 into a closed position against the mast 5, Figure 3, thus furling the sail, attached as aforesaid to the yardarms 1, against the mast 5. A protective sleeve 10 is provided at the bottom of the mast 5, disposed and adapted to be hauled up and over the furled sail, the folded struts 4 and the folded yardarms 1, holding the sail in a furled position against the mast 5, in a compact protected unit.

The rotating mast 5, Figure 4, turned by the tiller bar 9, facilitated by the bushings 11, permits the mast 5 to be turned in any direction, in order that the sail, affixed to the yardarms 1, as aforesaid, may catch the prevailing winds from any direction.

The sail may be quickly unfurled and set by removing the sleeve and actuating the collars by the hydraulic cylinder to move apart from each other.

It may be seen that the mast may be held upright on the deck of the ship by other than the leg means described. It may further be seen that, in case of mechanical failure of the hydraulic cylinder, or in case of emergency, or in the case of the use of this invention in undeveloped countries, where advanced technology may be lacking, the collars of this invention could be actuated by conventional rope and pulley manual means, thus raising and lowering the sail, as described above and resulting in the easy and rapid railing, furling and setting of sails, which is the objective of this invention.

The above disclosure and specification describes the embodiments of my invention and discovery, but as same may be used or adapted to use in forms, other than, or similar to, or varying from, the features set forth in the above disclosure and specification, I claim as my invention and discovery all forms of same which may be deemed to fall fairly within the scope of my appended claims.

Claims

1. A mechanical combination in which a mast provided with a tiller bar is rotatably attached by threaded bolt and bushing means to the deck of a ship, two leg members are attached by means to a conventional cap placed over bushings on the top of the mast and held in threaded bolt means, the leg members extend down behind the mast in a tripod like configuration to the deck of the ship to which they are secured by means, two collars are provided to fit slidably around the mast, the ends of two struts are attached by means to the sides of each collar and the other ends of the four struts are attached, two each, by means to the appropriate sides of the two yardarms, each yardarm being hinged at the center thereof, a hydraulic cylinder is attached by conventional means to one collar and to a spacer bar attached to the other collar, the action of the hydraulic cylinder moving the two collars slidably up and down the mast; a sail is conventionally attached to the yardarms; the collars, actuated by the hydraulic cylinder, move up and down the mast, the movement of the struts and the yardarms attached thereto furl and unfurl a sail, attached to the yardarms by conventional means, a protective sleeve is provided, adapted to be pulled by conventional means up and over the furled sail and the folded struts and yardarms.

2. A combination as described in Claim 1, in which the mast may be supported upright on the deck of a ship by any appropriate means other than leg means.

3. A combination as described in Claim 1, in which the operation of the collars and the tiller bar may be automated by conventional micro-processor means.

4. A combination as described in Claim 1, in which the collars may be actuated by conventional rope and pulley manual means.

FIG. 1

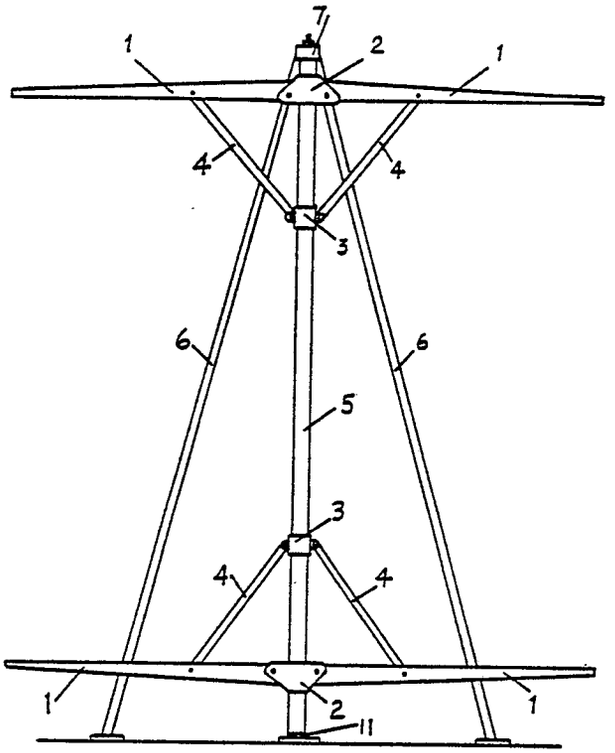


FIG. 2

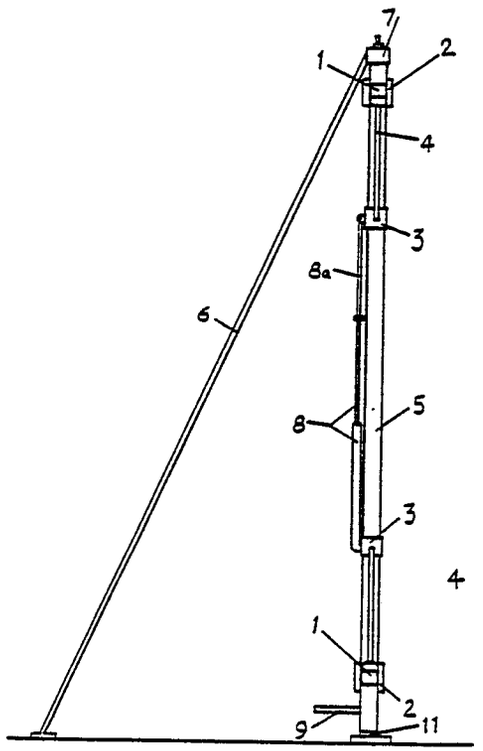


FIG. 3

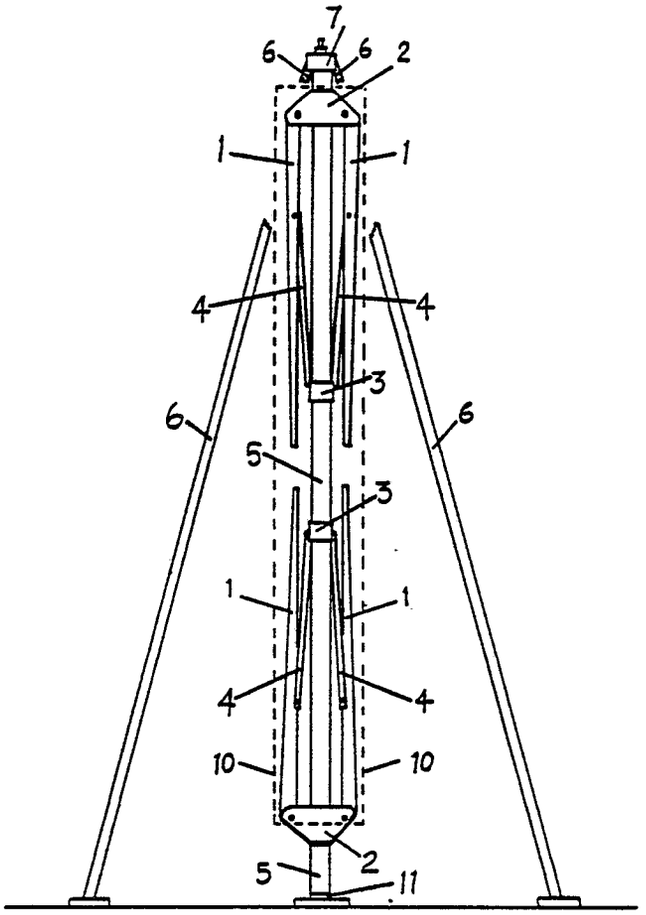
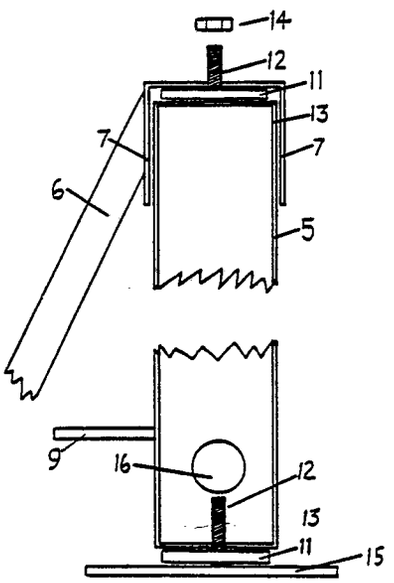


FIG. 4



European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 86 30 1017

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
E	EP-A-0 183 634 (L. DUCROCQ) * Whole document *	1,2,4	B 63 B 15/00 B 63 H 9/10
A	NL-A-7 109 187 (V.D. SLEEN) * Page 4, lines 4-17; figures 1-3 *	1,2,4	
A	GB-A- 888 132 (W. PRÖLSS) * Figure 5 *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 63 B
B 63 H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	06-06-1986	VISENTIN, M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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