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(72) Inventor: **Di Stolfo, Vincenzo**
20052 Monza, Milano (IT)

(74) Representative: **Riccardi, Sergio**
Riccardi & Co.
Via Macedonio Melloni, 32
20129 Milano (IT)

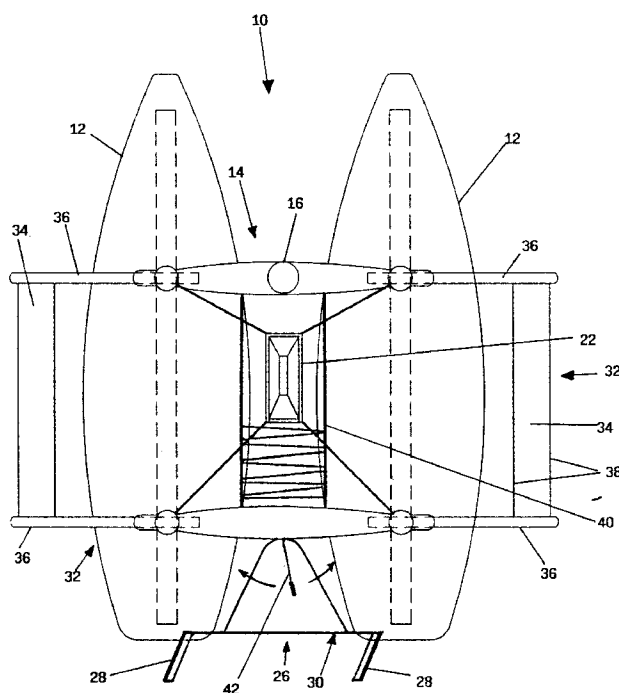
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(71) Applicant: **Di Stolfo, Vincenzo**
20052 Monza, Milano (IT)

(54) Sail watercraft provided with two hulls

(57) A new watercraft (10), having a sail, preferably free, is disclosed. Such a watercraft (10) comprising at least two "flat-bottomed" hulls (12) connected each other side-by-side by a proper connecting structure (bridge) (14). The hulls (12) that are used can be surf, windsurf type or the like provided that they are flat-bottomed. The watercraft according to the invention is also provided with a keel and a rudder (28) and substantially can be

completely disassembled. In practice a watercraft of this kind combines features which are proper of wind-surfs with those which are proper of common sailboats and allows to sail starting directly from the beach during prohibitive or impossible conditions for conventional sailboats together with the possibility of all the points of sails, from the close-hauled sailing to the sail before the wind.

**Fig. 2****EP 0 872 411 A2**

Description

The present invention relates to a new sail watercraft and particularly a watercraft comprising at least two flat-bottomed hulls arranged side-by-side and parallel to each other.

Several sailboats and motorboats are known in the art. Generally the sailboats can be classified according to the type and number of hulls. For example, catamarans generally have a pair of hulls, which are connected to each other in such a way, as to be parallel. While a watercraft such as a catamaran is practical, fast, substantially unsinkable, stable and funny-to-use, it has hulls dipping into the water, in other words it has a substantial "displacement" or draught.

From EP-A-0124416 a watercraft comprising two flat-bottomed and thick hulls which are connected to a third middle hull on which two masts provided with booms and movable feet is known: in practice the two hulls stabilize the third middle hull which could be defined as a tandem wind-surf and the whole watercraft has a large displacement.

EP-A-0012288 substantially relates to a windsurf comprising, in order to obtain a better stability thereof, two boards which are connected by a bridge. In this case the equipment is like that of a windsurf providing for a deflecting mast having a hinged and not fixed foot of the mast.

EP-A-0106932 relates to a watercraft, which can be converted into a catamaran with two very thick hulls dipping into the water and causing high displacement.

From EP-A-0306697 a watercraft comprising two hulls, which are also in such a case rather thick, connected to each other by a complex structure which supports two masts provided with respective booms connected to each other is known.

Finally WO 84/00134 discloses a tubular structure for connecting in a side-by-side fashion two wind-surf boards but such a structure is considered completely inadequate to the use on the sea of the thus obtained watercraft.

The watercraft according to the present invention, while has some advantageous features in common with a standard catamaran, provides for the use of hulls having a different shape allowing them to lightly dip into the water (very little displacement) and to "ride" the smallest waves or at least "cut" the highest ones. This feature makes the watercraft according to the present invention suitable for sailing substantially in any condition of the sea and allows it to be nearly always in a gliding attitude with a tempered wind (from 10 to 12 knots) with an 8 m² sail. Apart from excessive or "extreme" maneuvers, the watercraft according to the present invention is always with its two hulls stably laying on the water and has a minimum tendency to capsize.

A watercraft according to the invention is set forth in independent claim 1. The dependent claims set forth some other new features of the invention.

The watercraft according to the invention provides, in the preferred embodiment, two generally "thin" hulls of a type generally used in wind-surfs, which are connected to each other by a proper structure or connection assembly which further provides for a step for the keel and a support on which the fixed-foot-mast can be mounted.

Preferably the sail is a "free" sail, i.e. without any boom or provided with a substantially unimportant boom which can be useful only during slack, big slack and aft wind points of sails.

It is foreseen the possibility of using, in addition to a standard triangular sail (spanker), a jib.

In a convenient embodiment the sail height can be set along the mast according to the particular wind conditions and/or the skill or any particular need of the sailor. Generally the spanker is sheathed in the mast.

A rudder assembly is provided, such a rudder assembly comprising two rudders connected by a proper parallelogram structure. The rudders can be resiliently upturned so that the rudders can be dipped only when required and taking them back on board for example when the watercraft is placed on a beach or the like (or anyway it is drawn to the seashore). During the coming back step, the rudders, as soon as they hit the water bed, automatically lift. Analogously the keel can be not fixed and can be resiliently upturned in such a way as not to protrude downwardly when it is desired (swinging arrangement).

A detailed description of the invention will now be given, to be read with reference to the annexed sheets of drawings in which the various figures show:

- Figure 1 is a top plan view of the watercraft according to a first embodiment of the invention;
- Figure 2 is a bottom plan view of the watercraft according to a second embodiment of the present invention;
- Figure 3 is a side view of one of the hulls of the watercraft according to the present invention;
- Figure 4 is a plan top view thereof;
- Figure 5 is a diagrammatic side view of the frame connecting the two hulls;
- Figure 6 is a top plan view thereof;
- Figure 7 is a side view of the watercraft according to the present invention with its sail being heaved;
- Figure 8 is a side perspective view of a further embodiment of the invention having a one-piece connecting structure; and
- Figure 9 is a front view thereof.

Obviously the same reference numbers through the various figures indicate the same or equivalent parts.

The watercraft 10 according to the present invention comprises two hulls 12 (while the possibility of connecting a third hull is not excluded), a structure 14 connecting the two hulls 12 in which a housing 16 (which, even if not shown, can be set at a different position along

the watercraft axis) for a mast 18 on which a sail 20 can be mounted, and further a step 22 for a keel 24. The watercraft further comprises a rudder assembly 26 which, in the shown embodiment, comprises a pair of rudders 28 that are connected to each other by a parallelogram frame 30 and a rudder bar 42. Both the rudders can be upturned by the frame 30 as to be taken back on board or as not to be dipped into the water when desired.

In a particular and preferred embodiment of the invention, the structure 14 further comprises, in addition to a pair of stabilizing bars 40, a pair of appendix structures 32 which, as they are extended laterally, protrude with respect to the whole shape of the watercraft and allow the person or sailor (persons or sailors) who is (are) on the watercraft, to get on the surfaces 34 subtended by the arms 36 of said appendix structures 32 in order to generate a moment counteracting the wind action by a longer arm or, in quiet sea and wind conditions, offer a very convenient seat.

Preferably the appendix structures slide back telescopically and/or by a hinged arrangement within the main structure 14 when they are not required. The surfaces 34 can also be non continuous surfaces and can be made, for example, by subtended ropes 38 around which a further rope (not shown) can be wrapped in order to obtain a proper mesh or bearing part. Such an arrangement is extremely practical, easy and lightweight but it is to be understood that many other equally convenient arrangements could be devised, without departing from the scope of protection of the present invention.

Also as far as the connecting structure 14 is concerned it is pointed out that an exemplificative only embodiment has been illustrated in Figures 1, 2, 5-7 but such an embodiment has not to be construed as limiting.

A similar argument is also valid for the shape, the thickness and the structure of the hulls: the feature that they must have in common is their being substantially thin and flat-bottomed so that the part which is dipped into the water, when the watercraft is used, is relatively small and above all, the hulls must be able, if required, to go through the waves. The hulls can be changed to others having different characteristics, for example shorter hulls for kids and longer hulls for more than one sailor.

In a particularly convenient embodiment, though not shown, the hulls can be tilted with respect to the structure 14 plane, so that said hulls lay flat on the water when the whole watercraft is tilted because of the strength of the wind (the leeward hull).

The whole watercraft, as preferably also its structure 14 connecting the hulls does not provide displacement, undergoes a very scarce resistance against the waves which can be thus "threaded".

Figures 8 and 9 show a further embodiment of the invention. Unlike what has been previously disclosed, in the present case an integral structure 14 is used for connecting the two hulls together. The connecting structure

has a "X" or "H" shape in plan top view; the ends of the structure slowly slope down and they connect to the hulls. The middle part of the structure is raised with respect to the hulls and includes a step within which the keel can be threaded (as a bayonet), but such a keel could also be hinged and not fixed. At the rear part of the structure, a pair of "wings" is provided, such wings being conveniently seats for the sailor/s.

The support structure of such an embodiment is conveniently made of a composite material provided with a foamed or honeycomb core in order to lighten it without giving up the required strength requirements. In the foamed embodiment, the bridge, with or without the boards, is a very good life saving element.

Finally, in any of the embodiments, the sailor can hook up himself to the mast as to protrude from the watercraft and counteract the wind strength in a way that is commonly known as trapeze.

As set forth above the equipment which can be used is composed of a spanker or a spanker and a jib. While not shown through the drawings but easily inferable for a man skilled in the art, the free sail which is heaved on the mast can have different shapes and sizes but above all it can be set at a different height along the mast itself according to the conditions of the sea and the skill of the sailor.

Conveniently the hulls can be disassembled from the connecting structure, for example by a standard male/female joint assembly: in this way the whole watercraft is easily disassembled and can be carried or such a disassembling feature can be utilized for using hulls or boards having different shapes, thickness and characteristics. Also a bolt and nut assembly can be used.

Once disassembled, the hulls could also be used separately for example as surfboards or, when properly modified, as windsurf boards.

In addition to the positive features set forth above, it is now clear that a watercraft according to the invention allows to sail at sea (or any other water basin) starting directly from the beach during prohibitive or impossible conditions for conventional sailboats of which the present watercraft maintains all the possible points of sails (close-hauled, traverse, slack, big slack, aft wind, etc.). Proper boards and sails can allow sailing with a proper number of sailors, two or more, further along with the option of using a spinnaker.

It can reasonably be affirmed that such a watercraft has performances which are similar to those of windsurfs as also when the wind is modest, it is able to plane while and when the sea is heavy it does not experience the hit of the wave (it partially cuts the wave and partially slides on it). For the above reasons it could be defined as an "extreme sailboat".

It is clear, as stated above repeatedly, that the above shown and described embodiments are only illustrative of the invention and must not be considered limiting it. Thus, several changes, adaptations, additions

and substitutions of parts by others functionally equivalent could be made without departing from the scope of protection of the following claims.

Claims

1. Sail watercraft (10) comprising at least two hulls (12) connected to each other side-by-side by a proper connecting structure (14) supporting a mast (18) on which at least one sail (20) can be heaved, characterized in that said at least two hulls are substantially flat-bottomed hulls and are relatively thin and further said mast has its foot fixed.

2. Watercraft (10) according to claim 1, characterized in that it further includes a keel (24), which can be inserted into a proper step (22), provided in the connecting structure (14).

3. Watercraft (10) according to any of claims 1 or 2, characterized in that it further includes a rudder assembly comprising two rudders.

4. Watercraft (10) according to any of the preceding claims, characterized in that said connecting structure further comprises an appendix structure (32) extending partially out of the whole shape of the watercraft.

5. Watercraft (10) according to any of the preceding claims, characterized in that said appendix structure (32) at least partially can be introduced telescopically within the connecting structure (14) when it is not required.

6. Watercraft (10) according to any of the preceding claims, characterized in that said connecting structure is reticular so as to exhibit a low resistance against the waves.

7. Watercraft (10) according to any of the preceding claims, characterized in that said connecting structure is made integral and has a "X" or "H" top plan view shape.

8. Watercraft (10) according to any of the preceding claims, characterized in that said connecting structure can be disassembled from the hulls, preferably by a joint or bolt and nut arrangement.

9. Watercraft (10) according to any of the preceding claims, characterized in that it has at least a free sail provided with a sheet and transmission on the structure or connecting system or a small bar which can be used as a boom during carrier points of sails.

10. Watercraft (10) according to any of the preceding

claims, characterized in that said at least one sail can be set at various vertical positions along the mast and preferably such a mast can be mounted at any position along the watercraft axis.

11. Watercraft (10) according to any of the preceding claims, characterized in that an equipment comprising a spanker and optionally a jib is provided.

12. Watercraft (10) according to any of the preceding claims, characterized in that the hulls can be tilted with respect to the horizontal or structure plane i.e. the plane defined by the bridge connecting system.

13. Watercraft (10) according to any of the preceding claims, characterized in that the hulls can be changed to hulls having different characteristics and sizes according to the intended use.

14. Watercraft (10) according to any of the preceding claims, characterized in that said hulls are surf or wind-surf like boards and further can be also used separately for assembling a surf or a wind-surf.

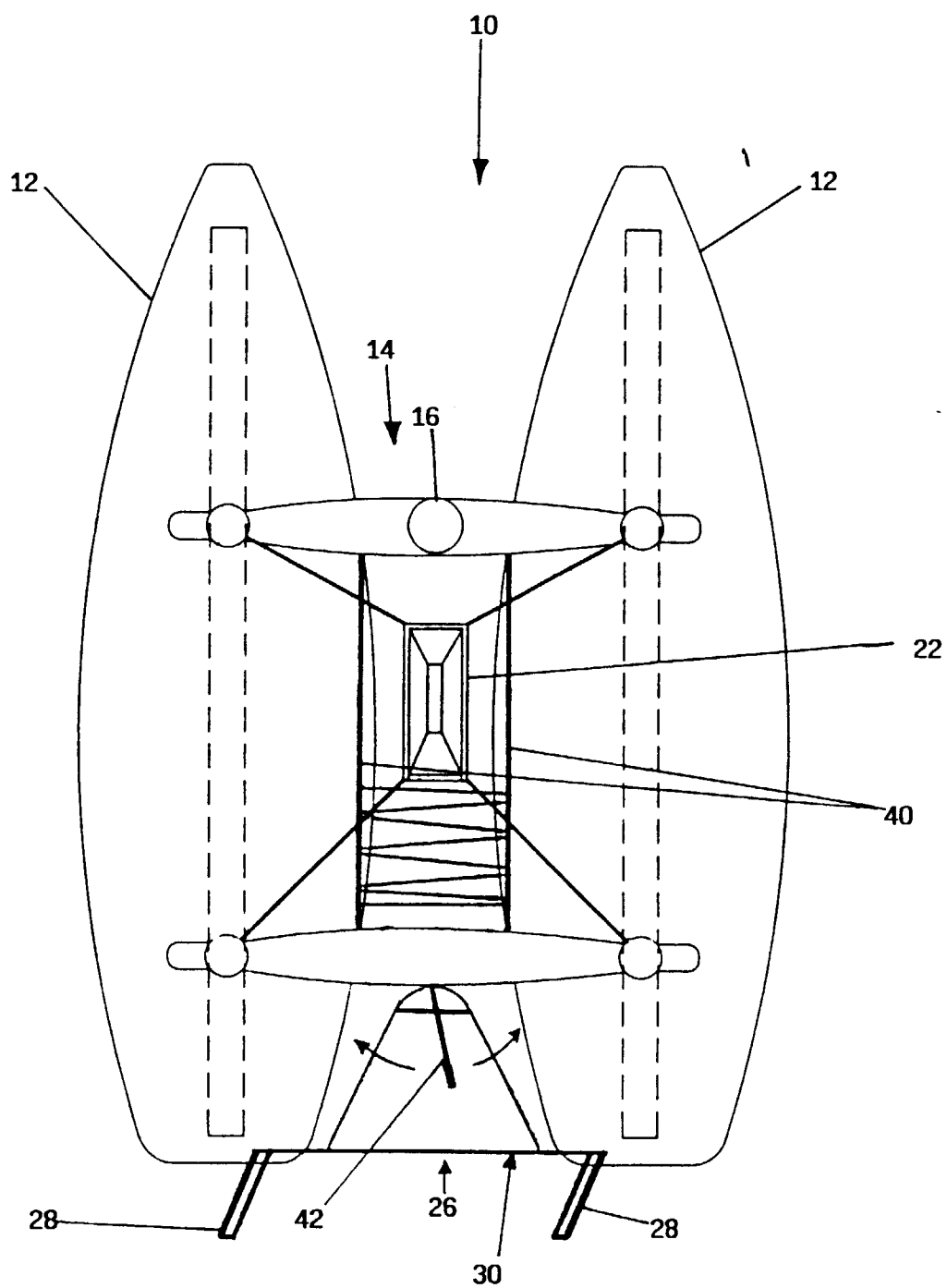


Fig. 1

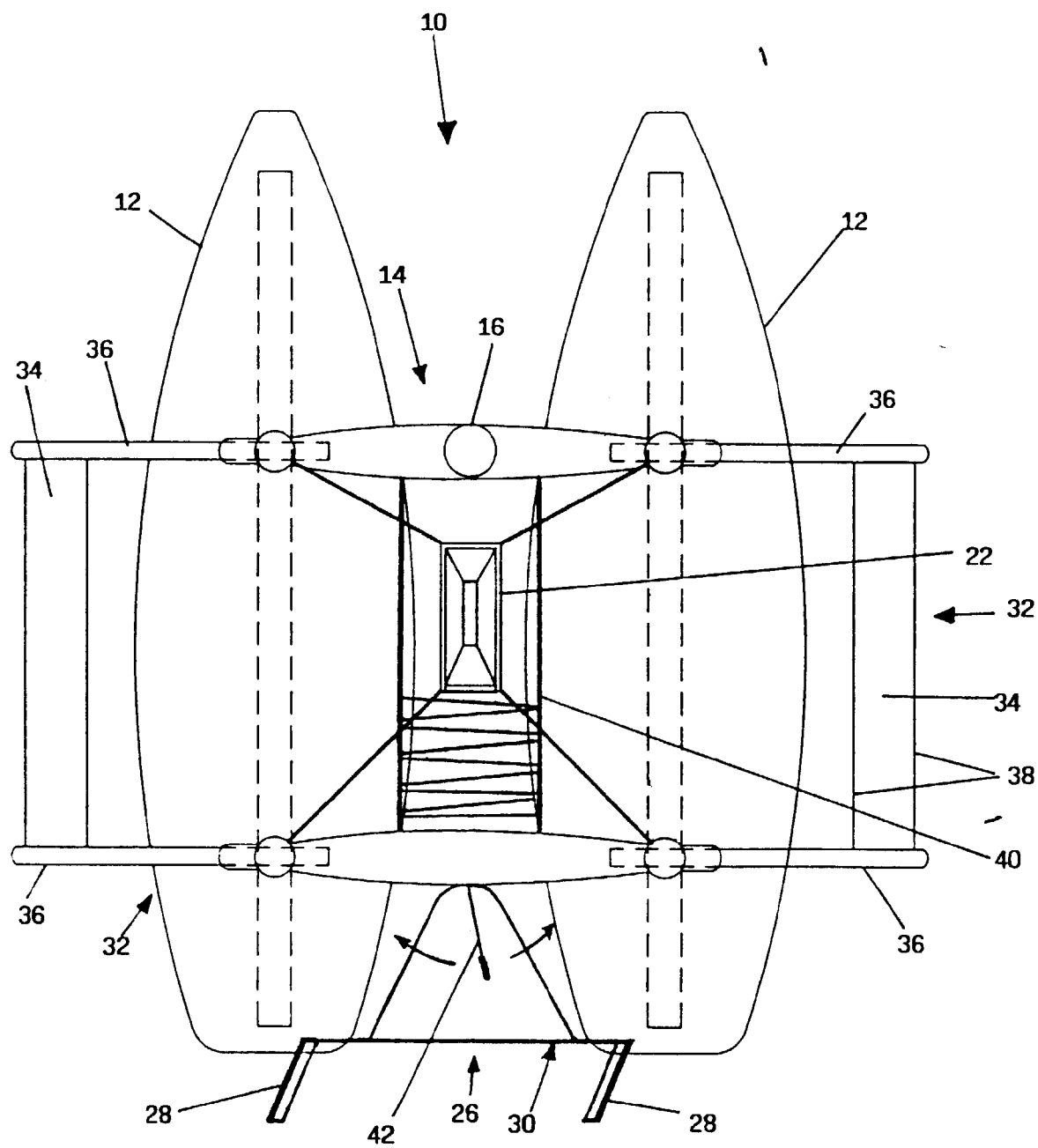


Fig. 2

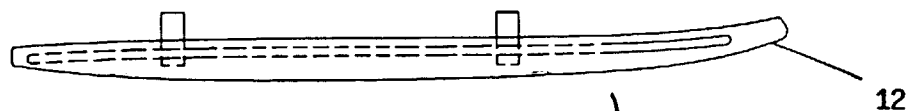


Fig. 3

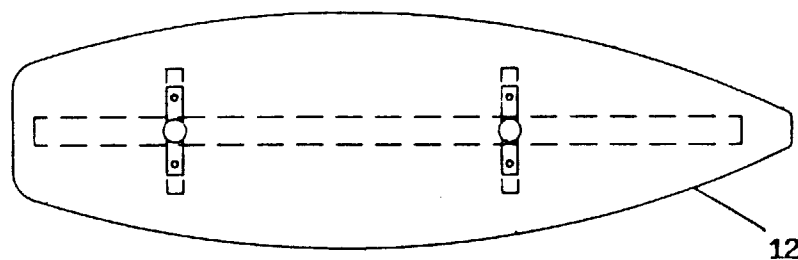


Fig. 4

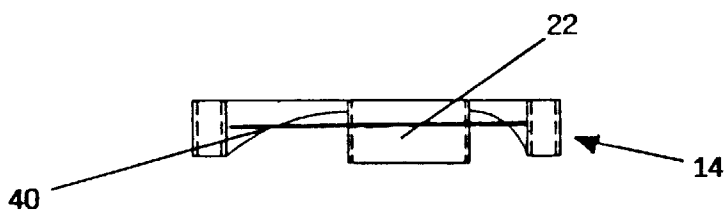


Fig. 5

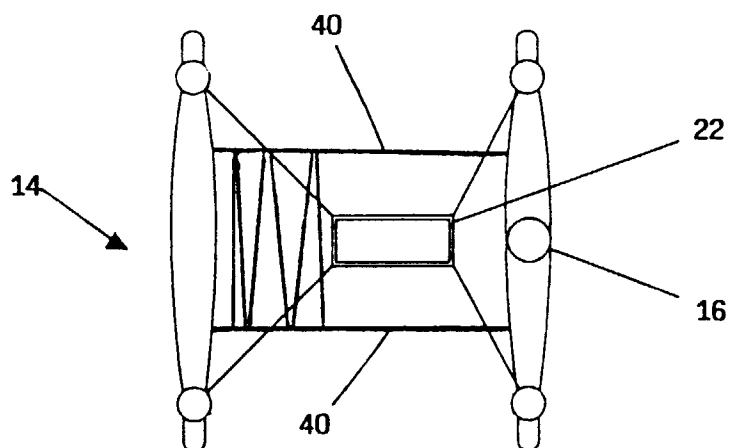


Fig. 6

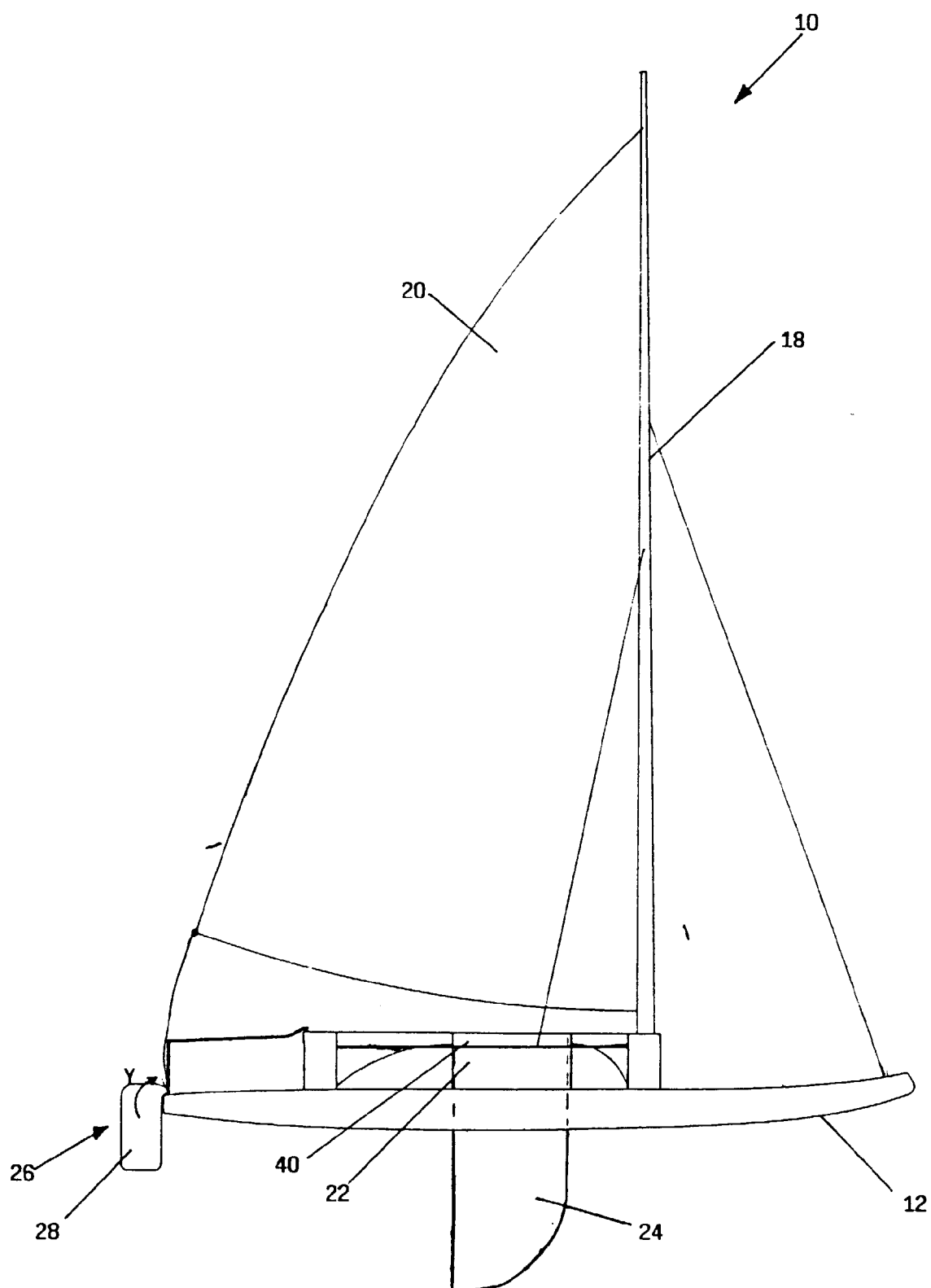


Fig. 7

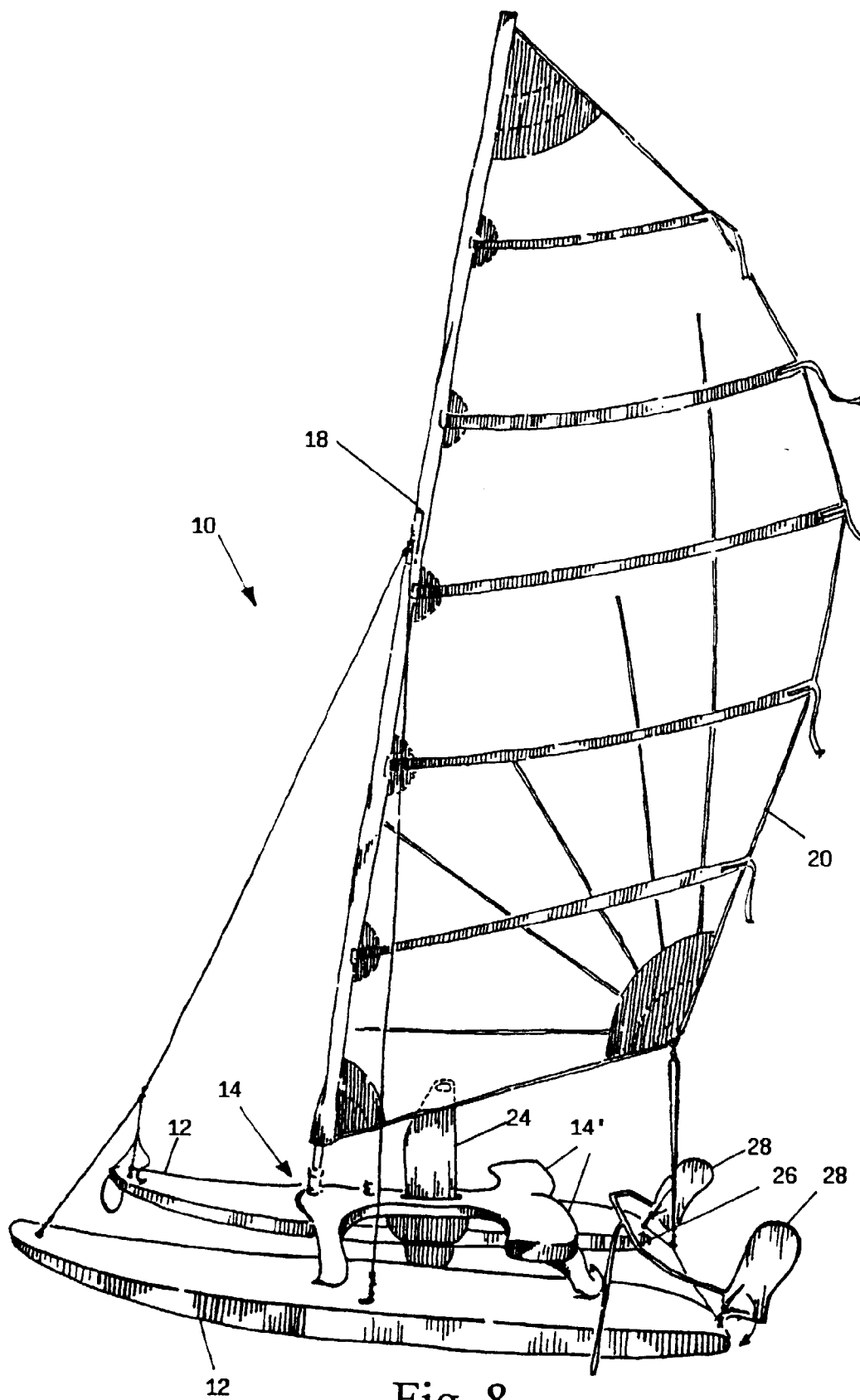


Fig. 8

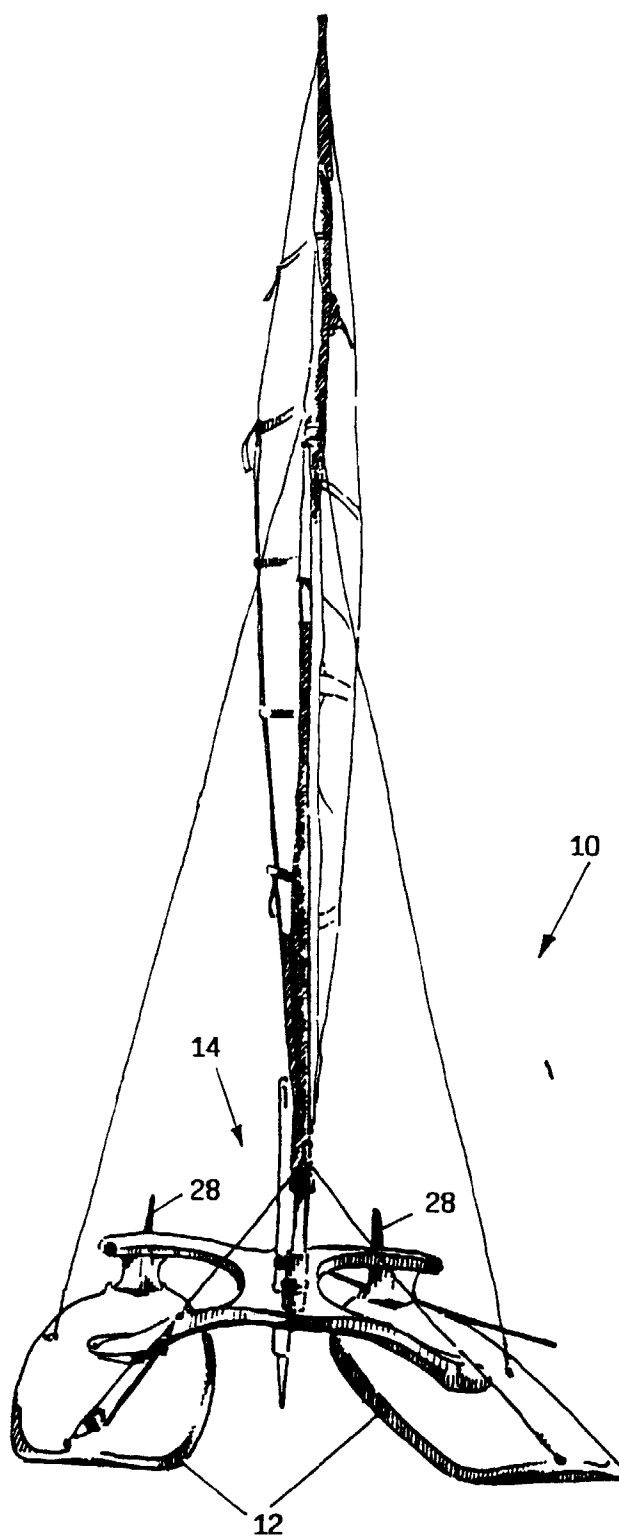


Fig. 9