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H. SCHWEITZER ET AL

3,487,800

WIND-PROPELLED APPARATUS

Filed March 27, 1968

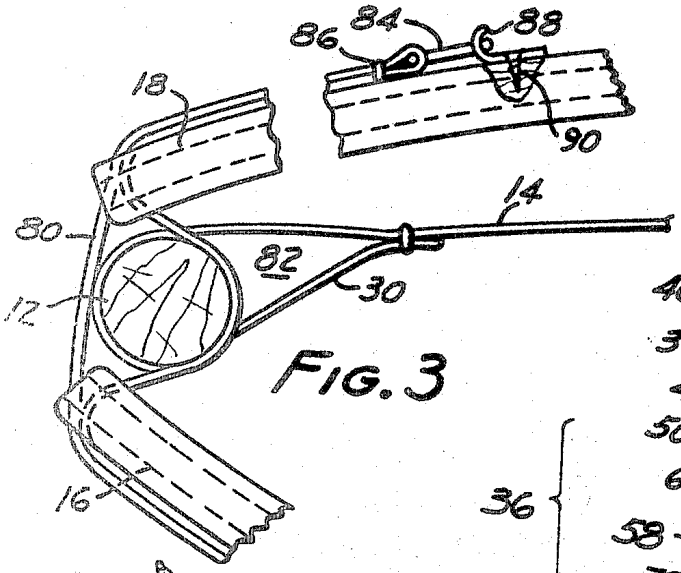

FIG. 3

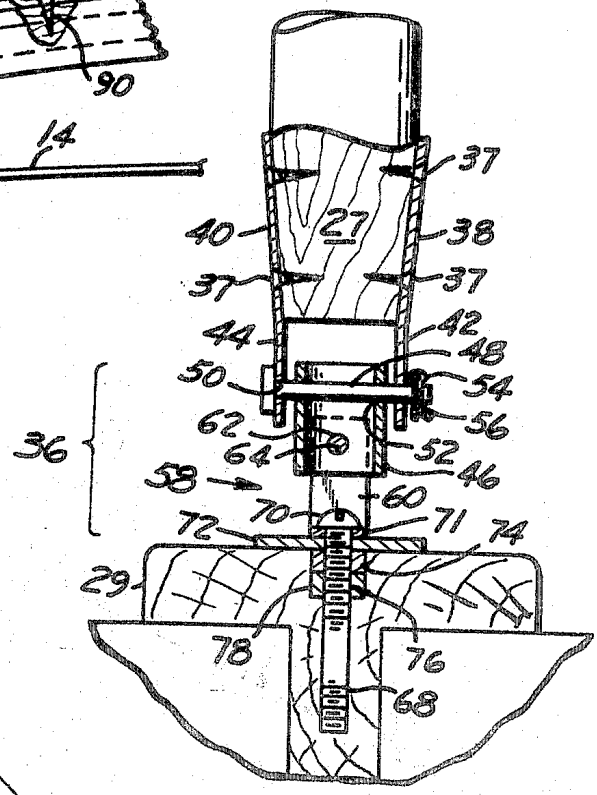

FIG. 2

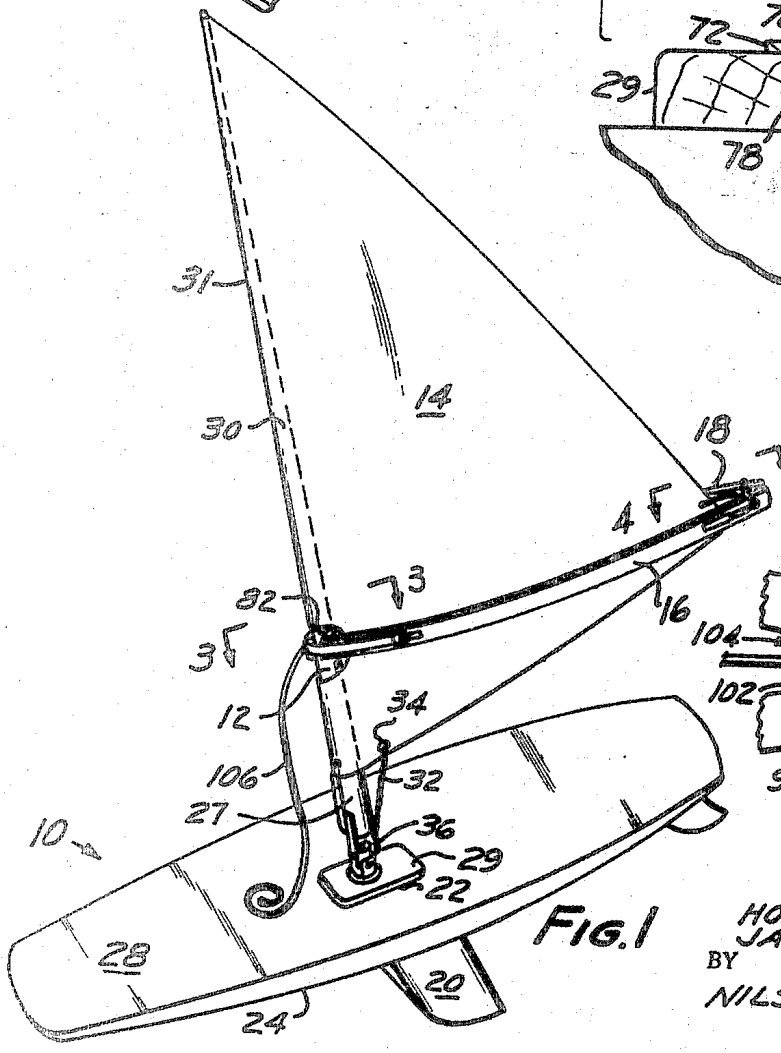

FIG. 1

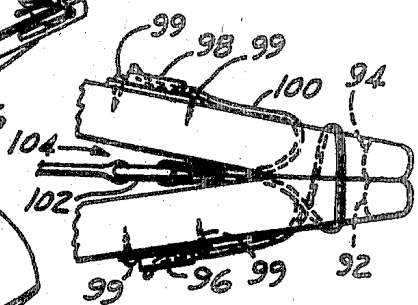

FIG. 4

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WIND-PROPELLED APPARATUS

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14 Claims

ABSTRACT OF THE DISCLOSURE

Wind-propelled apparatus in which a mast is universally mounted on a craft and supports a boom and sail. Specifically a pair of curved booms are arcuately connected athwart the mast and secure the sail therebetween, the position of the mast and sail being controllable by the user but being substantially free from pivotal restraint in the absence of such control.

BACKGROUND OF THE INVENTION

Field of the invention

The field of art to which the invention pertains includes the field of ships, particularly sailboats and iceboats, and the field of land vehicle sail attachments.

Description of the prior art

Sail propulsion has been suggested as a motive means not only for boats and iceboats, but also for such watercraft as surfboards and landcraft such as skateboards and sleds, i.e., generally any lightweight small craft. Typically, a sail is provided on a mast that is rigidly secured to the craft in a vertical position or else the sail and mast are entwined in a network of riggings and control mechanisms.

The general effect of providing a sail on a normally sail-free vehicle is to convert the vehicle into a water or landboat. Thus, by rigidly securing a sail to a surfboard, the feel of the surfboard and enjoyment as such is lost and the skill normally required to control it is no longer needed. Instead, one obtains the speed and feel of a light sailboat and needs substantially only those skills appropriate to control a sailboat. The same "denaturing" occurs with other vehicles modified to bear a sail.

A further problem arises when a sail is fitted to a vehicle that does not have high roll stability in that sudden or excessive winds can overturn the vehicle.

A need therefore exists for safely providing wind-propulsion means for a vehicle not normally so equipped but which means preserves the original ride and control characteristics of the vehicle.

SUMMARY OF THE INVENTION

The present invention provides wind propulsion means for a vehicle that adds new dimensions of wind responsiveness and speed and yet enhances the vehicle's normal ride and control characteristics to greatly increase the enjoyment obtained therefrom. Wind-propelled apparatus is provided comprising vehicle body means adapted to support a user and wind-propulsion means pivotally associated with the body means and adapted to receive wind for motive power. The position of the propulsion means is controllable by the user and is substantially free from pivotal restraint in the absence of such control.

In particular embodiments, the propulsion means is connected to the vehicle body by means of a universal

joint, e.g. a joint having three axes of rotation, or other such joint to enable the propulsion means to be substantially free-floating in the absence of user control.

The wind propulsion means can comprise a spar pivotally attached to the vehicle body and a sail on the spar. Means are provided to allow the user to grasp the sail on one or both sides thereof. Thus, a boom is provided laterally disposed on the spar to hold the sail taut and provide a hand-hold. In particular embodiments, a pair of booms is provided arcuately connected athwart the spar and securing the sail therebetween.

The invention can be used on watercraft, iceboats and landcraft. It can be used on small yachts, runabouts, canoes, rowboats, and other such craft, but is most advantageously used on small and lightweight vehicles such as surfboards, iceboats, skateboards, and sleds. Leeboard means can be provided for a watercraft of low roll stability such as a surfboard. The term "leeboard" is meant to include center boards and dagger-boards, as these terms are known to the sailing art, as well as other projections from the body of the craft, planar or otherwise extending into or onto the water for stabilization.

The present invention allows essentially all of the steering and control to be accomplished through the sail; i.e. no rudder or other steering mechanism is needed, although such need not be excluded. One may accelerate, turn and tack merely by manipulating the sail. However, because the sail is pivotally unrestrained, it must be held by the user with the user relying on his skill with the vehicle for balance. In the event of sudden or excessive winds, the user need only release the sail and it will immediately fall in any direction, freeing the vehicle from the propulsive force.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a perspective view of a wind-propelled apparatus according to an embodiment of this invention obtained by modifying a surfboard with a sail, spar and boom therefor and leeboard;

FIGURE 2 is a sectional view, on line 2—2 of FIGURE 1, of a universal joint used for pivotal motion of the sail;

FIGURE 3 is a sectional view, on line 3—3 of FIGURE 1, of the spar-side juncture between the booms; and

FIGURE 4 is a sectional view, on line 4—4 of FIGURE 1, of the clew-side juncture between the booms.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGURE 1, a wind-propelled apparatus is shown, including a surfboard **10**, spar **12**, triangular sail **14** and booms **16** and **18**. The surfboard **10** has a daggerboard **20**, as leeboard, inserted through an opening **22** provided in the body of the surfboard **10** and projecting obliquely from the bottom **24** thereof. A top portion of the daggerboard **20** extends somewhat beyond the top surface **28** of the surfboard **10** to provide a platform **29** for pivotal attachment of the spar **12** as will be fully described below.

The spar **12** is a stout, rounded, elongated fiberglass shaft which, in this case, is hollow for lightneses but may be of solid wood or metal, and has a cylindrical wood base **27** wedged through its lower end. The spar **12** serves as a pivotal mast for the sail **14** and is inserted within a hem **30** tapering along a long edge **31** of the sail **14** toward the top thereof. The bottom of the sail **14** is

secured to the spar **12** by a rope **32** threaded through an eyelet **34** in a lower edge of the sail **14** adjacent to the spar **12**.

Referring to FIGURE 2, the spar **12** is connected to the daggerboard platform **29** by means of a three-axis universal joint **36**. The joint **36** is made completely of stainless steel and is attached to the spar **12** by means of brace plates **38** and **40** held on opposite sides of the spar base **27** by wood screws **37**. The brace plates **38** and **40** have extended portions **42** and **44**, respectively, somewhat below the spar base **27** and disposed on opposite sides of a short section of stainless steel tubing **46**. A one-quarter inch diameter headed pin **48** extends through holes **50** and **52** in the brace plate extensions **42** and **44** and is rotatably secured by a cotter pin **54** inserted through a cotterway **56** in the headed pin **48**.

A U-shaped clevis **58** of stainless steel sheeting is disposed on the tubing **46** so that its sides **60** (only one of which is shown) lie below and transverse to the brace plate extensions **42** and **44**. A ¼-inch diameter headed pin **62** (shown in cross-section in FIGURE 2) extends through holes **64** in the clevis sides and in the tubing **46** and is rotatably secured by a cotter pin (not shown) through a cotterway in the headed pin **62**.

A three-inch long, ¼-inch diameter round head machine screw **68** rotatably secures the clevis to the daggerboard **20** by extending through a hole **70** in the base **71** of the clevis **58** and from there through a washer **72** and underlying nut **74** and locknut **76** set in a mortise **78** in the daggerboard platform **29**. The machine screw **68** holds the base of the clevis **58** with sufficient play to allow sliding rotation of the clevis **58** against the washer **72**.

Referring to FIGURES 1 and 3, a pair of curved, laminated wood booms **16** and **18** are provided about four feet from the surface **28** of the surfboard **10** and are arcuately connected at both their ends. At the spar-end, the booms are connected together and to the spar **12** by a loop of one-inch wide webbed tape **80** encircling the spar **12** through a crescent-shaped opening **82** in the sail hem **30**. The tape loop **80** has brass rings **84** at its ends held in place by stitches **86** through the looped tape and which secure the tape **80** to the booms **16** and **18** by engagement with brass hook fittings **88** secured to the booms **16** and **18** by wood screws **90**. The booms **16** and **18** thus provide a handhold for the sail **14** spaced upwardly from at least an intermediate point on the lower edge of the sail.

Referring to FIGURES 1 and 4, the booms **16** and **18** are provided at their clew ends with outhaul openings **92** and **94**, respectively, and jamb cleats **96** and **98**, respectively, which are secured to the booms **16** and **18** by screws **99**. An outhaul **100** is threaded from the jamb cleat **98** of one boom **18** through the outhaul opening **94** in that boom **18**, through a reinforced opening **102** in the sail clew **104**, through the outhaul opening **92** in the second boom **16**, looped through both outhaul openings **94** and **92** and from there to a second jamb cleat **96** on the other boom **16**. The outhaul **100** is then pulled taut and secured by the second jamb cleat **96** to hold the sail **14** taut between the booms **16** and **18**.

In operation, the user stands on the top **28** of the surfboard **10** behind the point where the spar **12** is attached by the universal joint **36** and grips one or the other of the booms **16** or **18**. If he were going before the wind and wished to make a turn, he would tilt the sail **14** forward, thus applying the force of the wind to the nose of the surfboard **10** and causing the board **10** to turn to the left or right depending on which side of the sail **14** was windward. On the other hand, if he wanted to come about into the wind for the purpose of tacking, he would pull the sail **14** backwardly to apply the force of the wind to the rear of the board **10**, causing the rear of the board **10** to move so as to come into the wind. As he is into the wind, he may complete the tack by merely walking in front of the sail **14**, grasping the boom on the other side and setting the sail **14** so that the wind captures it and the board **10** is then on its new course. The sail may be maneuvered forward and backward for speed control.

In the event that a sudden surge of wind threatens to capsize the surfboard **10**, the user may merely release the sail **14** and it will fall free into the water, completely removing the danger. The sail **14** is provided at its spar **12** end with a rope **106** so that the user can readily pull the sail **14** back into sailing position.

It will be understood that modifications and variations may be effected to adapt the foregoing apparatus for the expediencies of particular applications without departing from the scope of the novel concepts of this invention.

What is claimed is:

1. Wind-propelled apparatus comprising body means adapted to support a user and wind-propulsion means pivotally associated with said body means and adapted to receive wind for motive power for said apparatus, said propulsion means comprising a mast, a joint for mounting said mast on said body means, a sail and means for extending said sail laterally from said mast, the position of said propulsion means being controllable by said user, said propulsion means being substantially free from pivotal restraint in the absence of said user, said joint having a plurality of axes of rotation whereby said sail free falls along any of a plurality of vertical planes upon release by said user.

2. The apparatus of claim **1** wherein said propulsion means is adapted to be hand-held by said user but is otherwise substantially free from pivotal restraint.

3. The apparatus of claim **1** including means for said user to hold said sail.

4. The apparatus of claim **1** wherein said sail extending means comprises a boom laterally disposed on said mast to hold said sail taut and adapted to provide a handhold for said user.

5. The apparatus of claim **1** including means adapted to enable said user to grasp either side of said sail.

6. The apparatus of claim **1** adapted as a watercraft.

7. The apparatus of claim **6** including water stabilizing means associated with said body means.

8. The apparatus of claim **6** including leeboard means associated with said body means.

9. The apparatus of claim **1** wherein said propulsion means is substantially the sole means for changing the direction of travel of said apparatus.

10. Sail means for propelling a vehicle comprising a spar for a sail, hand-hold means associated therewith comprising a pair of curved booms arcuately connected athwart said spar for securing a sail therebetween, and means for attaching said spar to a vehicle in pivotal association therewith.

11. Wind-propelled apparatus comprising body means adapted to support a user, wind-propulsion means pivotally associated with said body means and adapted to receive wind for motive power for said apparatus, said propulsion means comprising a spar attached to said body in said pivotal association and a sail thereon, and a pair of curved booms arcuately connected athwart said spar and securing said sail therebetween, the position of said propulsion means being controllable by said user, said propulsion means being substantially free from pivotal restraint in the absence of said control.

12. The sail means of claim **10** including a sail on said spar and secured between said booms.

13. The apparatus of claim **1** wherein said sail has a lower edge extending outwardly from said spar, and including means spaced upwardly from at least an intermediate point on said lower edge for providing a handhold for said sail.

14. Wind-propelled apparatus comprising body means adapted to support a user and wind-propulsion means pivotally associated with said body means and adapted to receive wind for motive power for said apparatus,

said propulsion means comprising a mast, boom and sail laterally extended from said mast, a joint for mounting said mast on said body means, the position of said propulsion means being controllable by said user, said propulsion means being substantially free from pivotal restraint in the absence of said user, said joint having a plurality of axes of rotation whereby said sail free falls along any of a plurality of vertical planes upon release by said user.

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