

FORM 1

COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952

APPLICATION FOR A STANDARD PATENT

I\We,

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of

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hereby apply for the grant of a standard patent for an invention entitled:

MAST FOR SAILING BOATS.

which is described in the accompanying complete specification

Details of basic application(s):

Number of basic application	Name of Convention country in which basic application was filed	Date of basic application
40 07 951.1	DE	13 MAR 90

My/our address for service is care of GRIFFITH HACK & CO., Patent Attorneys, 601 St. Kilda Road, Melbourne 3004, Victoria, Australia.

DATED this 04th day of March 1991

Hilbert NOORMAN

GRIFFITH HACK & CO.



TO: The Commissioner of Patents.

AUSTRALIA DMO:AG P13791 18/2/4
PATENTS ACT 1952

A

APPLICATION
BY INVENTOR

DECLARATION IN SUPPORT OF AN APPLICATION
FOR A PATENT

In support of an application made for a patent for an invention entitled:
MAST FOR SAILING BOATS.

TITLE

FULL NAME AND
ADDRESS OF
SIGNATORY

I, Hilbert NOORMAN
of Zomerdijk 6, NL-7946 LZ Wanneperveen

(H.N.) GERMANY The Netherlands

do solemnly and sincerely declare as follows:

1. I am the applicant for the patent.
2. I am the actual inventor of the invention.
3. The basic application as defined by Section 141 of the Act was made in my name

COUNTRY

in GERMANY

ATE

on 13th March 1990

DELETE PARAGRAPHS
3 AND 4 FOR
NON CONVENTION
APPLICATION

PLACE AND DATE
OF SIGNING

4. The basic application referred to in the preceding paragraph was the first application made in a Convention country for protection in respect of the invention the subject of this application.

Declared at *WANNEPERVEEN*

this *15* day at *MART.* 1991

Signed *H.N.*

H.NORMAN

GRIFFITH HACK & CO

PATENT AND TRADE MARK ATTORNEYS

MELBOURNE · SYDNEY · PERTH

(12) PATENT ABSTRACT

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MAST FOR SAILING BOATS

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(57) Claim

1. A mast for sailing boats, having two profiles disposed at a distance apart from each other and with cross-panels which extend between these profiles, wherein it has a concave course for the internal surfaces of both profiles.

AUSTRALIA

PATENTS ACT 1952

Form 10

COMPLETE SPECIFICATION

(ORIGINAL)

FOR OFFICE USE

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Lodged:

Complete Specification-Lodged:

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Related Art:

TO BE COMPLETED BY APPLICANT

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Complete Specification for the invention entitled:
MAST FOR SAILING BOATS.

The following statement is a full description of this invention
including the best method of performing it known to me:-

The present invention relates to a mast for sailing boats, having two profiles disposed at a distance apart from each other and with cross-panels which extend between these profiles.

This type of mast is known, for example from the Patent GB 2 037 686 A. Two profiles, which run parallel to each other and of which the cross section has a somewhat drop-shaped configuration, are depicted. The somewhat drop-shaped cross section of the two profiles is intended to result in a development of the entire mast with relatively low air resistance. However, the rigidity of this type of mast is frequently not satisfactory in practice.

The problem to be solved by the invention is the creation of a mast which is very resistant to bending and, in addition, achieves a very good aerodynamic effect.

This problem underlying the present invention can be solved by having a concave course for the internal surfaces of both profiles.

In other words, the proposal is that the intermediate space between the two profiles should be barrel-shaped, by means of which a construction of the mast is achieved, in combination with the cross-panels disposed between the two profiles, which is very resistant to bending.

Additional advantageous developments of a mast in accordance with the present invention are described in the dependent Claims.

An example of embodiment of a mast in accordance with the present invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a diagrammatic cross-section through a first example of embodiment of a mast,

Fig. 2 is a diagrammatic cross-section through a second example of embodiment of a mast,

5 Fig. 3 is a diagrammatic front view of a mast from which some of the parts have been broken away,

Fig. 4 is a diagrammatic cross-section through a third example of embodiment of a mast, and

Fig. 5 & 6 are connections between mast and sail.

10 In the drawings, designated by the numeral 1, two mirror-image profiles are arranged symmetrically in relation to each other at a distance apart, each of said profiles having an inner surface 2, an outer surface 3, a leading edge 4 and a trailing edge 5. The intermediate space between the two profiles 1 is filled out at regular intervals by a transverse cross-panel 6. Where the cross-panel 6 comes into contact with the leading edge 4 of a profile, a front corner 7 of the cross-panel 6 is formed in each case and, correspondingly a rear corner 8 of the cross-panel 6 is formed where it comes into contact with the trailing edge 5 of a profile.

15

20 An imaginary axis 9 runs in each case from a front corner 7 to a rear corner 8 on either side of the mast. The concave course of the two inner surfaces 2 of the profile 1, and thus the barrel-shaped configuration of the intermediate space between the two profiles 1, results in the imaginary axis 9 along the greater part of its length does not pass through the body of the profile 1 but through the cross-panels 6. Because of this course of the axis 9, the cross-panels 6 absorb a large proportion of

the stresses, with the result that the entire mast has a configuration which is extremely resistant to bending.

5 A mast is depicted in Fig. 1 in which each profile 1 consists of individual strips 10 of wood, so that the profiles are solid and the inner and outer surfaces 2, 3 are substantially at the same distance apart along the cross-section of each profile. This type of mast construction is intended only for masts, for example, with relatively small height.

10 A mast based on a similar principle to that shown in Fig. 1 is depicted in Fig. 2 but in this case the separate profiles 1 are hollow in each case. The inner surfaces 2 and outer surfaces 3 are substantially constructed from thin strips 11 of wood which are covered on the outside with a coating 12 of GFK (fibre-glass reinforced plastics material), while the intermediate space between the strips of wood is filled with polyurethane foam 14. In each of the profiles 1 there are ribs 15 arranged at regular intervals above each other for stiffening the profiles. Such a rib 15 may be discerned in the right-hand profile 1 in Fig. 2, where the cross-section through this right-hand profile is offset vertically in relation to the cross-section through the left-hand profile 1.

15 There is a cross-panel 6 located at the same height as every second rib 15, in which case the transition between the cross-panel 6 and the profile 1 has a coved configuration as indicated by the region 16 depicted along the inner surface 2 of the right-hand profile in Fig. 2.

20 In the region of leading edge of each profile 1 there is a longitudinal cavity 17 provided to accommodate and protect cables, for example, for electric lighting.

Fig. 3 is a diagrammatic front view of the mast in accordance with Fig. 2, where the greater distance between the two leading edges is designated as A_v and the lesser distance between the two trailing edges is designated as A_h . It is also possible to see the coved contour of the transition from the cross-panel 6 to both profiles 1.

5 The two profiles 1 are closed at the top by means of a cover-plate which is provided with eyelets for fastening or diverting, for example, the rigging, of the main sail, of the fore staysail and similar standing or running rigging.

Fig. 4 depicts a third example of embodiment of a mast in accordance with the present invention in which there are several tubes 18 running longitudinally in the profiles 1. These tubes 18 have a hexagonal cross-section and extend with each of their opposite apices of the hexagon into the inner and outer profile surfaces 2 and 3 respectively. The various tubes 18 abut against each other with their flat surfaces and any small gap which may exist between said surfaces is filled, for example, with epoxide resin, and the individual tubes 18 are cemented together in this manner.

10 The tubes 18 themselves can be constructed from strips of wood which are first-of-all placed alongside each other on a sheet of film, with the edges of the strips of wood being mitre-cut in such a way that glue can be applied between the edges of the strips, after which the film is rolled around in such a way that the mitred edges 15 of the strips of wood are brought into contact to form the hexagonal tube 18.

20 In addition, the tubes 18 can be wrapped up, for example, in a laminated sheet of plastics material, in order to increase the rigidity and resistance to buckling of the tubes 18.

The tubes 18 can not only be constructed from individual longwall panels but,

alternatively, they could consist of a hollow extruded profile, for example a hexagonal aluminium tube.

The tubes 18 may be empty or else they may be filled with a foam plastics material.

5 In those situations between the inner and outer surfaces 2 and 3 of the profile where the tubes 18 are not present, it is possible, for example at the level of the cross-panels 6, to provide a rib of wood or of synthetic plastics material or of metal.

10 The example of embodiment as shown in Fig. 4, is provided with cross-panels 6a of which the side surfaces are not determined by the contours of the inner surfaces 2 of the profiles, but instead, in the region of the tubes 18, these cross-panels 6a extend to make direct contact with the surfaces of the tubes 18 so that there is a serrated border region present on the cross-panels 6a. In the case of tubes having a circular cross-section, the border regions of the cross-panels 6a would have a corresponding scalloped outline to fit around the tubes.

15 Between the outer surfaces 3 of the profiles and the tubes 18, as depicted in the example of embodiment in Fig. 4, there are cavities formed which can either remain empty or else be filled with foam plastics material.

20 The electric cabling, in the case of the example of embodiment according to Fig. 2 - as described previously - can be effected through a hollow tube 17. In the case of the mast in accordance with Fig. 1, at the junction between the edges of two strips 10 of wood, it is possible to provide a slight grooved indentation for insertion of the conductor cable which can be glued into position between the strips 10 of wood. The insulation, in the case of lacquer-insulated copper wires for example, is so well protected by the strips of wood 10 so that no additional insulation is necessary.

In the example of embodiment as shown in Fig. 4, electric wiring or also running rigging can be passed through the tubes 18 or through the triangular cross-section intermediate spaces defined by the outer adjacent surfaces of the hexagonal tubes 18 and the outer surface 3 of the profile.

5 With the types of mast in accordance with the present invention, it is advantageous for achievement of good aerodynamic performance, to keep and handle the luff of the sail allocated to the mast under tension. For this purpose, it is possible to provide means on some or all of the cross-panels 6 or 6a in order to affix receiving devices for making fast the luff. Thus, for example, the luff can be inserted into a metal profile which is made fast with several connections to holes which have been moulded into the ending region of the cross-panels 6 or 6a or which are moulded into metal lugs which are affixed to the ends of the cross-panels 6 or 6a. Furthermore, it is also possible, in the region of the cross-panels 6 or 6a, to provide a hook which is gripped by an eye which, in its turn is connected with the metal profile which the luff of the sail is pulled into. In this manner, the luff can not belly out from the mast, so that in all cases the flow-favouring effect of the mast in accordance with the present invention can have an optimal influence on the sail.

10 A rotatable connection of a sail 19 to the mast is shown in Fig. 5 and 6. The sail 19, in the region of each flow-favouring profiled cross-plate 6a, possesses a sail batten 15. A holder 21 encloses the mast-side end of the sail batten 20 and with its other 20 end it grips a profiled rod 22. The profiled rod 22 extends from the masthead to the mast foot and consists, for example, of aluminium. In order to increase its mechanical strength it is provided, in the middle of its hollow cylindrical head section, with a steel wire 23 which has a coating 24 of synthetic plastics material.

25 In the region of each cross-plate 6a, there is a connector 25, welded to the rib of the profiled rod 22, extending to the end region of the cross-plate 6a, which is formed

by a metal tongue, or by a laminate of wood or of synthetic plastics material 26. The connector 25 is held there rotatably by means of a bolt 27, said bolt being inserted through a drilled hole 28 shown in Fig. 4. The range of movement of the connector 25, in relation to the cross-plate 6a, is limited by the depth of a cut-out 29 in the 5 connector 25.

The rotatable mounting allows for a flow-favourable adaptation of the sail setting to the direction of the incident wind. In connection with the guiding under tension of the luff of the sail, which ensures a constant distance between sail and mast, it is made possible to sail most closely to the wind. In this way, the aerodynamic 10 advantages of the mast in accordance with the present invention are supported and boosted.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A mast for sailing boats, having two profiles disposed at a distance apart from each other and with cross-panels which extend between these profiles, wherein it has a concave course for the internal surfaces of both profiles.
- 5 2. The mast according to Claim 1, wherein it has wood strips used to form each of the profiles.
- 10 3. The mast according to Claim 1, wherein the profile is constructed as a hollow profile.
4. The mast according to Claim 1, wherein a multiplicity of tubes is disposed in each profile in the longitudinal direction of the mast.
- 15 5. The mast according to Claim 4, wherein the cross-panels extend laterally to the tubes, with the sides of the cross-panels being adapted to the contour of the tubes.
6. The mast according to Claim 4 or 5, wherein the tubes extend into the inner and outer surfaces of the profiles.
- 20 7. The mast according to any one of Claims 4 to 6, wherein each of the tubes has a hexagonal cross-section.
8. The mast according to any one of Claims 1 or 4 to 7, wherein it has a sandwich-like construction of the two profiles with polyurethane foam filled in between the inner and outer surfaces of the profiles.
- 20 9. The mast according to Claim 8, wherein there are ribs inside each profile,

arranged at regular intervals above each other.

10. The mast according to Claim 9, wherein the distance between the cross-panels above each other is substantially twice the distance between the ribs.
- 5 11. The mast according to any one or more of the preceding Claims, wherein there are rounded coved transitions from the cross-panels to the two profiles.
12. The mast according to any one of the preceding Claims, wherein the distance between the two leading edges is greater than the distance between the two trailing edges.
- 10 13. The mast according to any one of the preceding Claims, wherein a hollow tube is firmly connected to the profile in the front region of each profile and extends along the length of the profile.
14. The mast according to any one of the preceding Claims, wherein the two profiles are closed at the top by means of a cover-plate provided with connectors for standing and running rigging.
- 15 15. The mast according to any one of the preceding Claims, wherein there are receiving devices connected to the cross-plates for making fast the luff of the sail.
16. The mast according to any one of the preceding Claims, wherein there is a guide [profiled rod] for the sail which, by way of connectors, runs at a distance away from the end regions of the cross-plates.
- 20 17. The mast according to Claim 16, wherein connector between the guide [profiled rod] and the cross-plate is rotatably mounted.

DATED THIS 4TH DAY OF MARCH 1991

Hilbert NOORMAN

By his Patent Attorneys: GRIFFITH HACK & CO.

Fellows Institute of Patent Attorneys of Australia

FIG.1

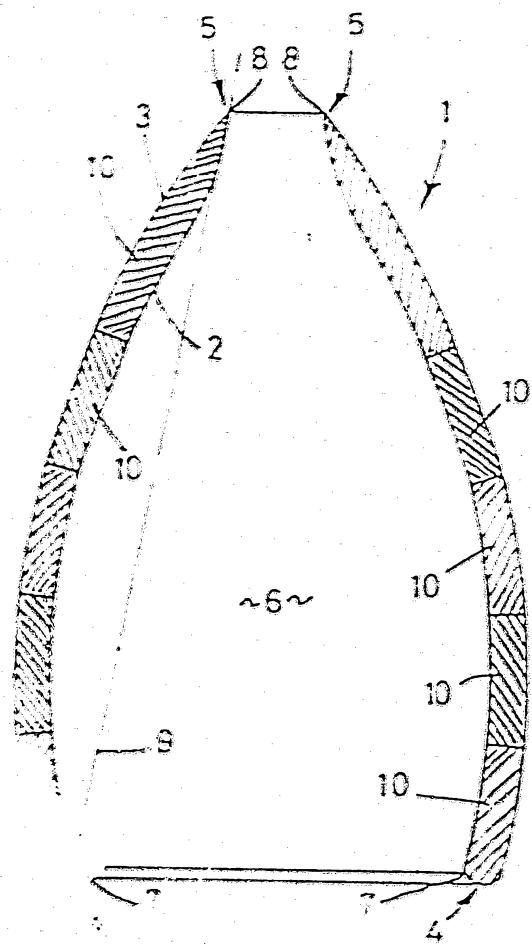


FIG.2

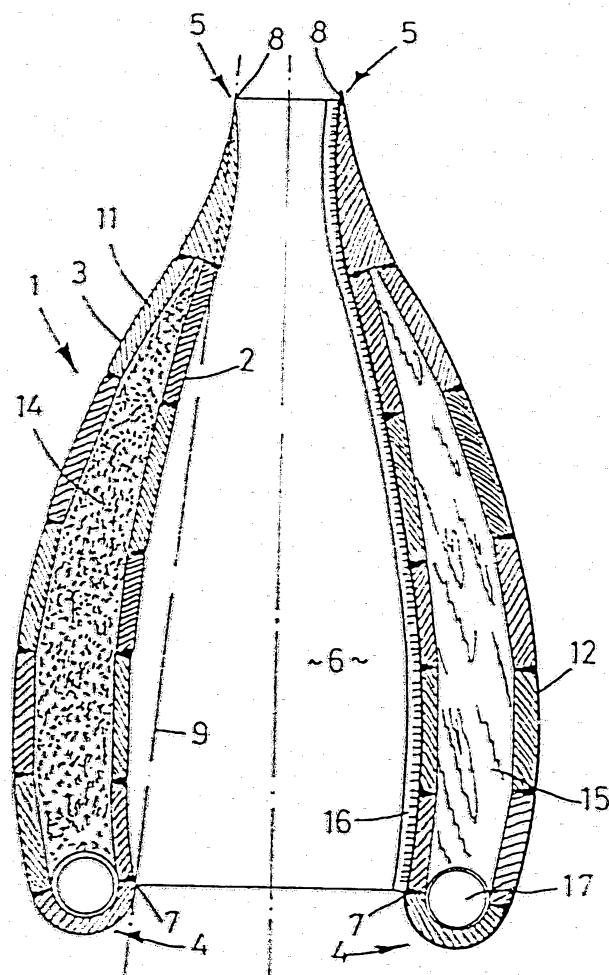
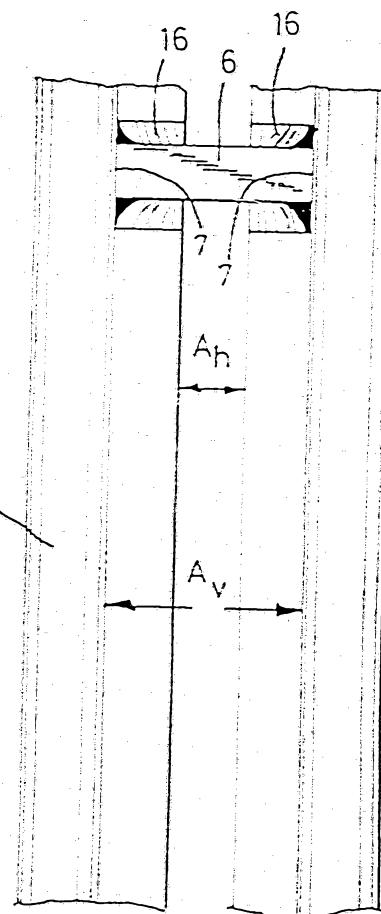


FIG.3



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FIG.4

