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(54) **Brace for mounting of shrouds on the hull of a sailboat**

(57) Brace for mounting of shrouds (13, 14) on the hull of a sailboat by way of a fixed mounting device (22), such as chain plates, has a through-going bore (20) for reception of a crossbolt (21), which is attached to the mounting device (22). The brace (1) consists of to halves (2) releasably connected to each other, which abut each other along a common plane (4) extending perpendicular to the crossbolt (21) of the mounting device (22) when mounted. The two parts (2) of the brace have, on the surfaces (5) abutting each other, a first cavity (7) for reception of an end of a lower shroud (13) and a second cavity (8) for reception of an end of a topshroud (14), each of the mentioned ends having its own expansion (15, 16).

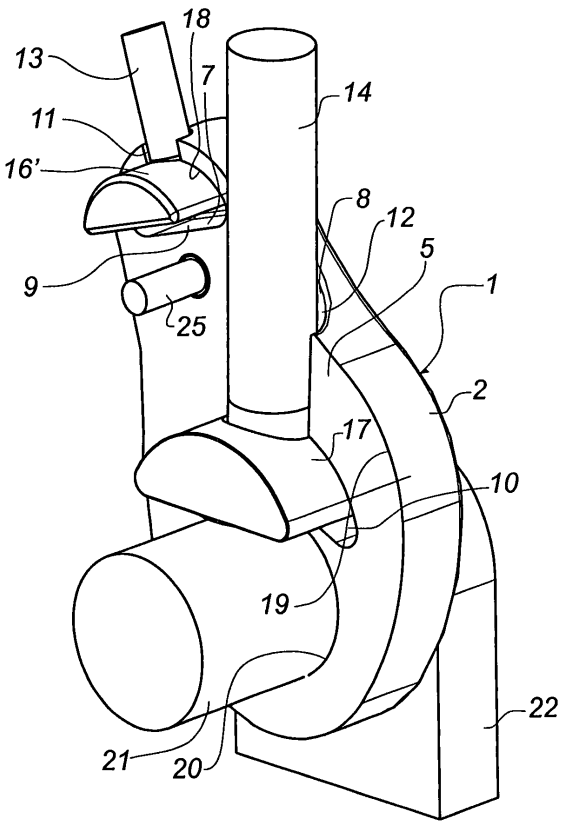

Fig. 1

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Description

[0001] The invention concerns a brace for mounting of shrouds on the hull of a sailboat by way of a fixed mounting device, such as chain plates, where the brace has a through-going bore for reception of a crossbolt, which is attached to the mounting device.

[0002] It is known to mount the vertical shroud, also known as the topshroud, and a diagonal shroud, also known as the lower shroud, on the deck of a sailboat. Normally, this is done by connecting each of these to separate joint elements, which can be mounted on a fixed brace on the deck.

[0003] The object of the invention is to limit the number of joint elements necessary to connect the respective shrouds to the deck of the boat as well as the braces placed thereon.

[0004] According to the invention, this is achieved by a brace consisting of to halves releasably connected to each other, where the halves abut each other along a common plane extending perpendicular to the crossbolt of the mounting device when mounted, and by the two halves of the brace having, on the surfaces abutting each other, a first cavity for reception of an end of a topshroud and a second cavity for reception of an end of a lower shroud, each of the mentioned ends having its own expansion.

[0005] It is thus achieved that both a topshroud and a lower shroud on each side of a sailboat can be connected with the same brace, which itself can be mounted on a single mounting device. Thus, among other things, less wind resistance is achieved when the boat is to be used for sailing race, and a relatively easy fastening of the two shrouds is achieved, too.

[0006] It is particularly advantageous if each of the cavities is shaped symmetrically in relation to planes which substantially coincide with the central axis of the through-going bore, by which the weight force is transferred directly to the crossbolt in question, without subjecting the brace to stressing moments.

[0007] According to the invention, the cavities may be adapted to receive the respective shroud expansions with intermediate seating members, whereby an improved power transfer is obtained.

[0008] Moreover, according to the invention, each of the two cavities may consist of an internal part for reception of the expansion of the shroud in question and an external part for passage of the shroud from the outside and into the internal part, where, closest to the external part, the internal part has a cylindrical surface with a generator extending parallel to the central axis of the bore and a radius of curvature positioned closer to the central axis of the bore than the cylindrical surface in question, which constitutes part of a surface of revolution and has a generator extending parallel to the central axis of the bore and a centre positioned in the vicinity of or further away than the central axis of the bore, and where the external part has a conical shape, being most narrow closest to the internal part. It is thus obtained that the shrouds may move slightly independent of each other in the brace during the movements which the mast of the sailboat may be subjected to. This provides a further reduction in the stressing moments to which the brace may be subjected.

[0009] The external part of at least one of the cavities may be offset from the common plane of the brace in a direction parallel to the central axis of the bore, by which an improved mounting of the lower shroud in relation to the topshroud may be achieved, since the courses of the two may deviate slightly from each other seen in the longitudinal direction of the boat.

[0010] According to the invention, it is particularly advantageous if the internal parts of the cavities are shaped symmetrically in relation to the common plane.

[0011] Furthermore, according to the invention, the internal cavities may be delimited on the inside by a cylindrical surface, which constitutes part of a cylindrical surface of revolution and has a generator extending parallel to the central axis of the bore and a centre positioned in the vicinity of or further away than the central axis of the bore. It is thus obtained that especially one of the cavities may be positioned relatively close to the bore for the crossbolt.

[0012] Finally, according to the invention, the halves may be releasably connected by means of a crossbolt extending through similar borings in the two halves, by which these halves are relatively easily separated and assembled.

[0013] The invention is described in more detail below with reference to the drawing in which

Fig. 1 and 2 show the brace when mounted with, respectively, a half removed for the sake of clarity and both halves assembled and mounted on a complete mounting device on a not-shown deck, while only parts of a topshroud and a lower shroud are shown,

Fig. 3 shows the brace of Fig. 2, seen from the right on a reduced scale,

Fig. 4 shows the brace of Fig. 2, seen from the side,

Fig. 5 shows the brace of Fig. 1, seen from the side,

Fig. 6 shows the ends of the shrouds shown in Figs. 1-5 with their position in relation to each other retained, but without a seating member,

Fig. 7 shows a sectional view of a seating member for the lower shroud and the top shroud, respectively, along the lines shown in Fig. 8, and

Fig. 8 shows the mentioned seating members, seen from the side.

[0014] The brace shown in Figs. 1-5, which has been given the general reference number 1, comprises to halves 2 and 3, of which only one is shown in Figs. 1 and 5. These halves abut each other along a common plane 4. In the shown embodiment, the two halves have an almost pear-like shape when seen from the side, and are delimited by substantially two mutually parallel sides. At the common plane 4, where the two halves 2 and 3 abut each other when mounted, each of the two halves has its own substantially plane surface 5 and 6, of which only the surface 5 can be seen in Figs. 1 and 5, whereas the surface 6 is indicated by a reference number in Figs. 2 and 3. The two halves 2 and 3 are provided with recesses, which face each other in twos when the halves are mounted, forming two cavities 7 and 8, each of which consists of an internal part 9 and 10, respectively, and an external part 11 and 12, respectively. The two cavities 7 and 8 are adapted so that they may receive a lower end of a diagonal shroud 13 and a vertical shroud 14, respectively, which are only shown in part in the drawing. The diagonal shroud 13 is also known as a lower shroud, and the vertical shroud 14 as a topshroud.

[0015] As can be seen in Fig. 6, the mentioned lower ends of the lower shroud 13 and the topshroud 14, respectively, are provided with an almost half-spherical expansion 15 and 16, respectively, at the bottom, the upward-turning surface being zone-shaped in the drawing, whereas the lower part of the expansion is delimited by a plane surface, extending perpendicular to the axis of the respective shroud 13 and 14.

[0016] Today, the shrouds on a sailboat are often made from solid spring steel and are thus in the form of solid bars, but it is also commonly known to make them from wire rope on which separate spherical terminals are mounted. Solid bars in combination with the present brace entail that so-called shroud-tighteners may be left out here.

[0017] As is especially apparent from Fig. 5, the external parts 11, 12 of the cavities 7, 8 are slightly conically shaped, being most narrow closest to the internal part. Thus, the shrouds may move slightly in the brace 1. As can be seen in Figs. 1, 2 and 7, the cavity 7 for reception of the lower shroud 13 may be thus shaped that its external part 11 is slightly offset from the centre plane 4, so that the brace 1 fits even if the course of the lower shroud 13 deviates slightly. In other respects, the internal parts of the cavities 7 and 8 are shaped substantially symmetrically around the common plane 4 and, as can be seen in Fig. 2, the internal part 10 of the cavity 8 extends axially all the way through the two halves of the brace 1.

[0018] When mounted, the expanded lower ends 15 and 16 of the shrouds 13 and 14, respectively, are provided with separate seating members 16' and 17, respectively, by means of which they are positioned in the respective cavities 7 and 8. These seating members give the shrouds 13 and 14 a larger contact surface in the internal parts 9 and 10 of the cavities 7 and 8. The seating members 16' and 17 enable the shrouds 13 and 14 to move slightly in relation to the seating members 16' and 17, this mobility being further promoted by the conical shape of the external parts 11, 12 of the cavities 7, 8.

[0019] As appears from the drawing, the internal parts of the cavities 7 and 8 are delimited by surfaces each of which constitutes part of a cylindrical surface of revolution having a generator extending perpendicular to the common plane 4 and a centre positioned in a direction away from the top parts of the cavities 7 and 8. These parts of a cylindrical surface of revolution have been given the general reference numbers 18 and 19 in Fig.

1. The opposite sides of the internal parts of the cavities 7 and 8 are also delimited by parts of a cylindrical surface of revolution, of which the one in the cavity 7 is almost plane, whereas the one in the cavity 8 is more curved. In both cases, the generator extends perpendicular to the common plane 4 when mounted, and the centre is also here positioned in a direction away from the external parts of the cavities 7 and 8.

[0020] As also appears from the drawing, the brace 1 has a through-going bore 20 adapted for passage of a crossbolt 21, which itself is adapted for mounting in a mounting device, such as chain plates 22, which usually consists of two upward-projecting flanges with an eye for reception of the crossbolt 21. The mounting device is fastened on the hull of the sailboat in question, eg through welding. The bore 20 has a circular cross section and a central axis 23 extending perpendicular to so-called common plane 4 of the brace 1. Moreover, the halves of the brace have a through-going bore 24 for reception of a fastening bolt 25, which makes it possible to connect the two halves 2, 3 releasably to each other. Although this it not shown, the bore 24 may be adapted with a stepped expansion for reception of a bolt head, which is not shown either.

[0021] The positioning of the cavities 7, 8 is adapted to fit the natural positions of the lower shroud 13 and the topshroud 14, and such that their respective axes pass through the central axis 23 of the bore 20.

[0022] The parts of the brace may advantageously be made from stainless steel, and the mounting of the two ends of the shrouds 13 and 14 is carried out by joining the two halves 2 and 3 around the ends of the shrouds 13 and 14, after which the brace is mounted on the mounting device 22 by means of the crossbolt 22.

[0023] The invention has been described with reference to a preferred embodiment. Many changes can be made without thereby deviating from the idea and scope of the invention.

Claims

1. Brace for mounting of shrouds (13, 14) on the hull

of a sailboat by way of a fixed mounting device (22), such as chain plates, where the brace (1) has a through-going bore (20) for reception of a crossbolt (21), which is attached to the mounting device (22), **characterised in that** the brace (1) consists of to halves (2, 3) releasably connected to each other, where the halves abut each other along a common plane (4) extending perpendicular to the crossbolt (21) of the mounting device (22) when mounted, and that the two halves (2, 3) of the brace have, on the surfaces (5, 6) abutting each other, a first cavity (7) for reception of an end of a lower shroud (13) and a second cavity (8) for reception of an end of a top-shroud (14), each of the mentioned ends having its own expansion (15, 16).

2. Brace according to claim 1, **characterised in that** each of the cavities (7, 8) is shaped symmetrically in relation to planes which substantially coincide with the central axis (23) of the through-going bore.

3. Brace according to claim 1 or 2, **characterised in that** the cavities (7, 8) are adapted for reception of the respective shroud expansions (15, 16) with intermediate seating members (16', 17).

4. Brace according to claim 1, 2 or 3, **characterised in that** each of the two cavities (7, 8) consists of an internal part (9, 10) for reception of the expansion of the shroud (13, 14) in question and an external part (11, 12) for passage of the shroud (13, 14) from the outside and into the internal part (9, 10), where, closest to the external part (11, 12), the internal part (9, 10) has a cylindrical surface (17, 18) which constitutes part of a surface of revolution and has a generator extending parallel to the central axis (23) of the bore (20) and a centre positioned in the vicinity of or further away than the central axis (23) of the bore (20), and that the external part (11, 12) has a conical shape, being most narrow closest to the internal part (9, 10).

5. Brace according to claim 1, 2, 3 or 4, **characterised in that** the external part of at least one of the cavities (7, 8) is offset from the common plane (4) of the brace (1) in a direction parallel to the central axis (23) of the bore (20).

6. Brace according to one or more of claims 1-5, **characterised in that** the internal parts (9, 10) of the cavities (7, 8) are shaped symmetrically in relation to the common plane (4).

7. Brace according to claim 5 or 6, **characterised in that** the internal parts (9, 10) of the cavities (7, 8) are delimited on the inside by a cylindrical surface, which constitutes part of a cylindrical surface of revolution and has a generator extending parallel to the central axis (23) of the bore (20) and a centre positioned in the vicinity of or further away than the central axis (23) of the bore (20).

8. Brace according to one or more of claims 1-7, **characterised in that** the halves (2, 3) are releasably connected by means of a crossbolt (25) extending through similar borings (24) in the two halves (2, 3).

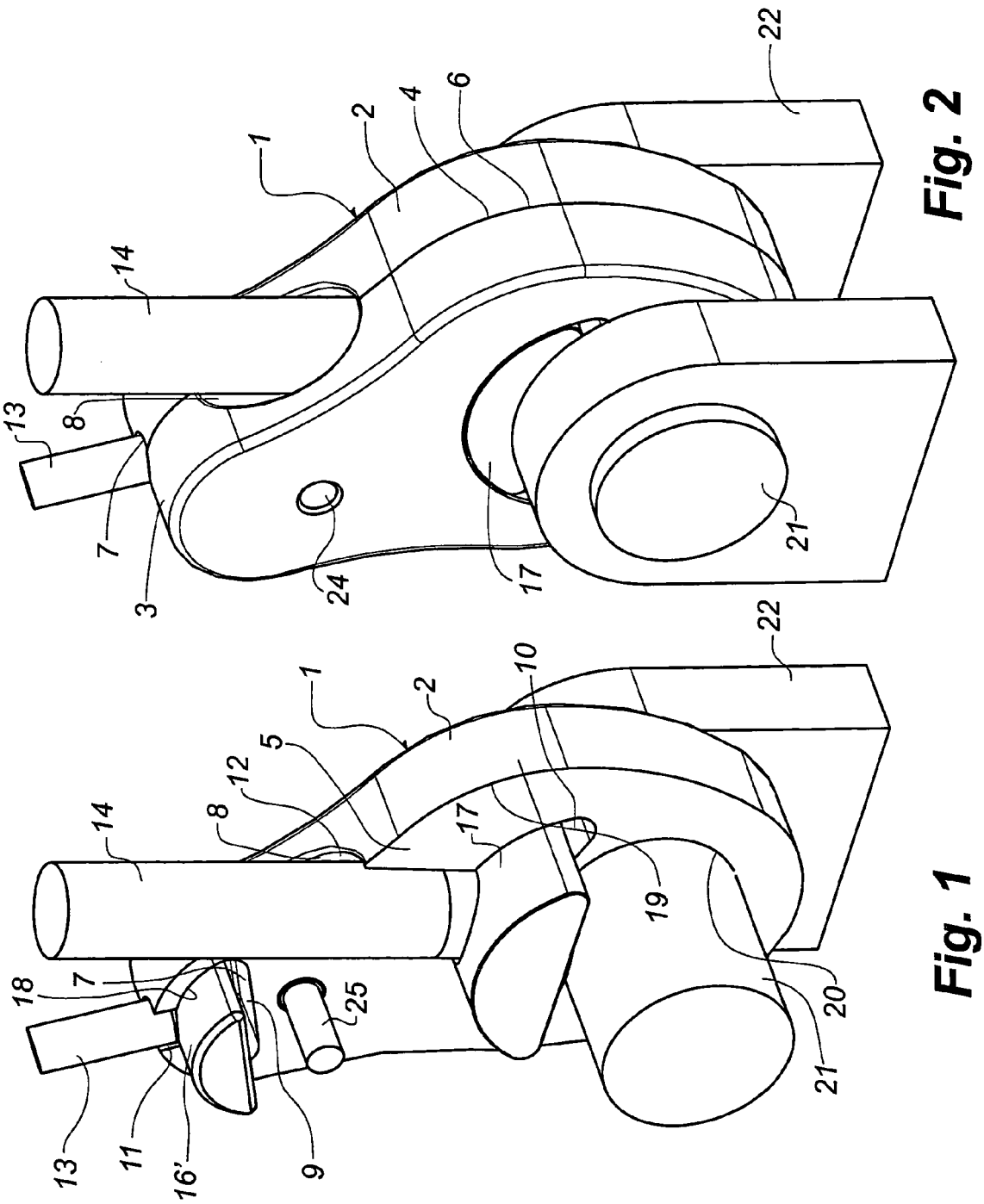
22
6
4
2
1
14
13
8
7
3
24
17
21

Fig. 2

22
10
1
2
5
12
8
14
17
19
18
7
25
20
21
13
11
16'
9

Fig. 1

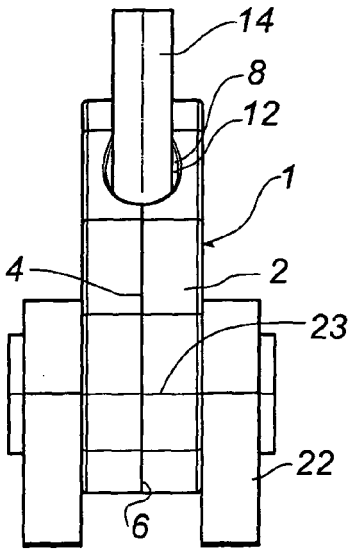

Fig. 3

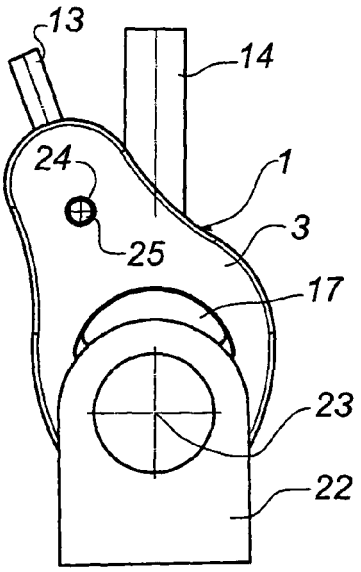

Fig. 4

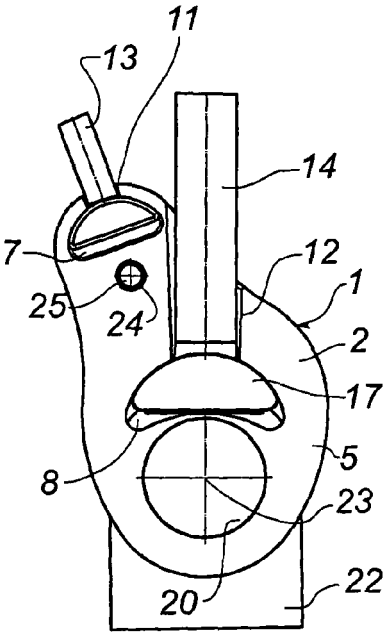

Fig. 5

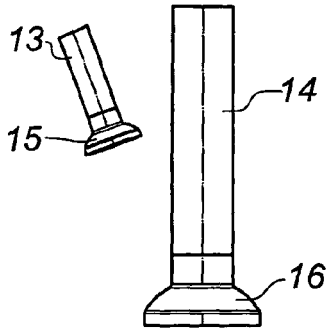

Fig. 6

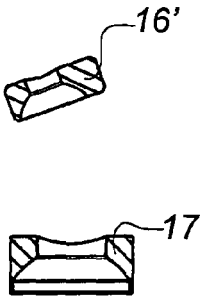

Fig. 7

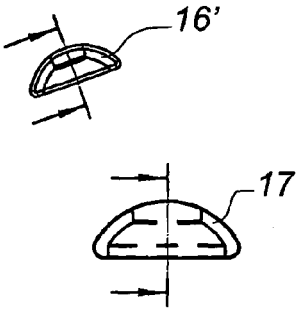

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 08 38 8003

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	FR 2 678 234 A (CHANTIERS BENETEAU [FR]) 31 December 1992 (1992-12-31) * page 3, line 14 - page 6, line 35; figures *	1-8	INV. B63B15/02
A	FR 2 602 205 A (BENETEAU CHANTIERS [FR]; BERRET JEAN [FR]) 5 February 1988 (1988-02-05) * page 4, line 6 - page 7, line 29; figures *	1-8	
A	US 5 458 076 A (LOUTREL STEPHEN P [US] ET AL) 17 October 1995 (1995-10-17) * abstract; figures *	1	
A	WO 03/042572 A (FREDERIK ANDERSENS MASKINFABRI [DK]; ANDERSEN FRODE [DK]) 22 May 2003 (2003-05-22) * abstract; figures *	1	TECHNICAL FIELDS SEARCHED (IPC) B63B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 May 2008	Moya, Eduardo

CATEGORY OF CITED DOCUMENTS

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