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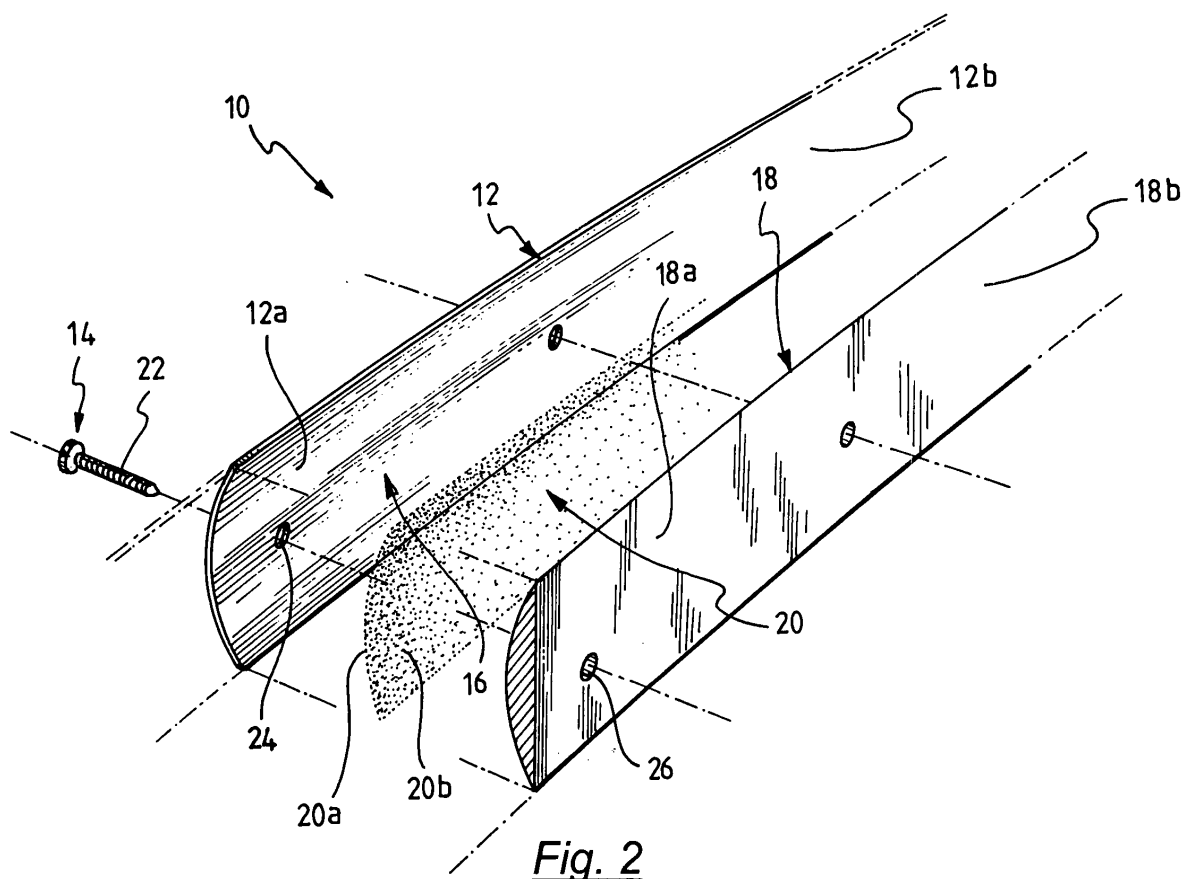
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(54) **Protection boat for a keel and/or profiled parts of a boat**

(57) The invention relates to a protection structure for a keel or profiled parts of a boat. The protection structure (10) has advantageously an exemplary finishing, as well as lightness and sturdiness, and comprises a sec-

tion (12) with a predetermined length and a plurality of fixing means (14) to fix the section to the keel; the structure further comprises a recess (16) longitudinally formed in the section (12) and a plastic-material filling element (18) in at least a portion of said recess.



**Fig. 2**

**Description**Field of application

**[0001]** The present invention relates, in its more general aspect, to a protection structure for a keel and/or profiled parts of a boat.

**[0002]** In particular, the invention relates to a protection structure for a keel or wearing boat parts generally protected by sections or mouldings, like for example fender bars.

**[0003]** The invention comprises a rod-shaped section having a predetermined length and intended to be fixed to a keel or to said wearing boat parts by a plurality of fixing means.

Prior art

**[0004]** As it is well known in the boating technical field, the term keel means that portion of a boat hull which is positioned longitudinally fore to aft, connecting the transverse frameworks and joining the skin of the two hull sides.

**[0005]** In the prior art a protection structure is usually applied to the keel, outside the hull, in order to save it in land operations, for example during the boat haulage, and to protect it from possible scrapings for example against the depths.

**[0006]** The known protection structure comprises a section being substantially as long as the keel: this section is a stainless steel lump, generally obtained by drawing. The sectional shape of this section is usually a circular segment.

**[0007]** The section is fixed to the keel by means of a plurality of fixing means composed of self-threading screws being distributed in correspondence with respective through holes, provided along the section in a predetermined spaced relation with each other.

**[0008]** Although advantageous under different points of view, the protection structure arranged as above schematically described, has known drawbacks.

**[0009]** First of all, the high lump section cost is pointed out.

**[0010]** In fact, for the realisation thereof, three or more passages in a drawbench are generally required with a following annealing operation: moreover, the section coming from the annealing has a rough surface, which must preferably undergo a finishing operation, for example lapping and subsequent polishing, with further corresponding costs.

**[0011]** The aim of the present invention is that of providing a protection structure for a keel and/or profiled parts of a boat, capable of meeting the above-described requirement, meanwhile overcoming, in a simple and effective way, the drawback mentioned with reference to the prior art.

Summary of the invention

**[0012]** The solution idea on which the invention is based is that of providing a protection structure for a keel and/or profiled parts of a boat comprising a section including a longitudinal recess that is filled by a plastic material.

**[0013]** According to this solution idea the technical problem is solved by a protection structure defined in claim 1 and following.

**[0014]** Further features and advantages of the protection structure for a keel according to the present invention will be apparent from the following description of a preferred embodiment thereof, given by way of non limiting example with reference to the attached drawings.

Brief description of the drawings

**[0015]**

Figure 1 is a schematic perspective view of a boat equipped with a keel protection structure according to the present invention and shown in an exploded view.

Figure 2 is a schematic perspective exploded view of a protection structure according to the invention.

Figure 3 is a schematic sectional view of the protection structure of figure 2, when being used.

Figure 4 is a further schematic perspective view of a boat equipped with a protection structure for profiled-parts according to the present invention.

Detailed description of a preferred embodiment

**[0016]** With reference to the figures, a protection structure according to the present invention is shown and globally indicated with 10, for a keel 30 of a boat 32.

**[0017]** The protection structure 10 comprises a substantially rod-shaped section 12, being longer than wide and thick and intended to be constrained to the keel 30 and/or profiled parts 15 of the boat for the whole length thereof. The structure 10 also comprises a plurality of fixing means 14 to fix the section 12 to the keel 30 or to the parts 15.

**[0018]** Profiled parts mean all those boat wearing portions or boat portions intended to perform a shock-resistant function, like for example fender bars. By simple way of example, reference can be made to figure 4 which schematically shows a boat 32 being peripherally equipped with a protection and finishing moulding extending along the whole boat edge. In particular, the stern region 25 of this boat 32 is equipped with the protection structure 10 according to the invention.

**[0019]** According to an aspect of the present invention, and as better shown in figure 2, the structure 10

comprises a recess 16 longitudinally formed in the section 12. Furthermore, the structure 10 comprises a plastic-material filling element 18 in said recess 16 or, at least, in at least one portion or section of this recess 16.

**[0020]** Generally, the section 12 is made of steel, preferably stainless steel; while the filling element 18 is waterproof and with a predetermined elasticity.

**[0021]** In the example of the figures, the section 12, having the recess 16, is implemented by a steel list having a hump-like profile, obtained for example from a rectangular-or-trapezoidal-section list, of a predetermined width (for example 50 mm), a predetermined thickness (for example 2 mm) and having at least a greater flat face with a predetermined high surface finishing. The finishing is preferably obtained after bending the section.

**[0022]** In other words, the section 12 with the recess 16 is composed of a "C"-section semi-lunar section.

**[0023]** The element 18, in the example, is implemented by a plastic material section, preferably PVC, equipped with a surface conjugated with a surface of the recess 16, i.e. it is implemented by a section having a massive circular-sector-shaped section.

**[0024]** More precisely, the section 12 has an extrados surface 12a and an intrados surface 12b, defining the recess 16; the element 18, having a circular-sector-shaped section, has an extrados surface 18a and an intrados surface 18b. Obviously, the conjugate surfaces are the intrados surface 12b of the section 12 and the extrados surface 18a of the element 18.

**[0025]** The section 12 and the element 18 are mutually constrained. An adhesive is preferably used to this purpose. Or rather, a both sides adhesive tape 20 with opposed faces 20a and 20b is used, fixed at first by the face 20a in the recess 16 of the section 12 and then joint, after removing the a siliconed protective layer from the face 20b, to the element 18.

**[0026]** Before the implementation on the keel 30, the so-realised protection structure 10 and i.e. the assembly of the section 12, the both sides adhesive tape 20 and the element 18, undergoes a compression to scavenge the remaining air possibly trapped between the both sides adhesive tape 20, the section 12 and the element 18 respectively, as well as to ensure the full adhesion of the both sides adhesive tape 20 to the section 12 and to the element 18. This compression is performed for example by letting the structure 10 pass into a simple roller press.

**[0027]** In the example of the figures, the plurality of fixing means 14 through which the section 12, complete with the element 18, is constrained to the keel 30, is composed of screws 22, for example self-threading screws, for example of the D8 type with a 6 mm diameter, which are distributed in correspondence with respective through holes 24 and 26, crossing the section 12 and the element 18 respectively and which are provided in a predetermined spaced relation with each other, for example 200 mm.

**[0028]** To cover the whole length of the keel or other boat parts, multiple sections of structure 10 must eventually be provided. By simple way of example, figure 2 has indicated four different sections of structure 10 with the references: 10a, 10b, 10c and 10d to cover the whole length of the keel 30.

**[0029]** The operation of the protection structure for a boat keel according to the present invention is specified hereafter.

**[0030]** The element 18 is mounted in the recess 16 of the section 12 as above described and, after said compression or pressing operation, as they say, the protection structure 10 is ready for application to the keel 30 or to any part of the boat 32 requiring a protection profile.

**[0031]** The assembly of the section 12 and of the element 18, which is flexible, is put into contact with the keel 30, so to follow the profile thereof, and it is fixed thereto by means of screws 22, which are screwed starting from one of the two ends of the keel 30, preferably starting from the bow of the boat 32.

**[0032]** The main advantage reached by the boat keel protection structure according to the invention is an unusual surface finishing quality.

**[0033]** Another advantage is that the assembly of the section and of the plastic-material element, pasted by the both sides adhesive tape, is unusually both light and resistant.

**[0034]** Another advantage of the invention is that the assembly of the section, of the both sides adhesive tape and of the plastic-material element has a good flexibility, being thus easy to mount along the keel profile. On the contrary, in the prior art, the lump section shaping operation, although annealed, to follow the keel profile, in order to give good results, must be performed by skilled operators.

**[0035]** A further advantage is that this structure is considerably cheaper than in the prior art, both in terms of costs of the materials being used, and in terms of production speed. In fact, for example, the lump section drilling operation to let fixing screws pass is simplified with respect to the prior art.

**[0036]** Not least advantage of the invention is the qualitatively exemplary boat aspect, achieved because the section perfectly follows the keel profile and - if possible - it minimises possible small irregularities.

**[0037]** Obviously, in order to meet specific and contingent requirements, a skilled in the art could make several changes and variations to the above-described protection structure, all comprised however in the scope of protection of the present invention as defined in the following claims.

## Claims

1. A protection structure (10) for a keel (30) or profiled parts (15) of a boat (32), comprising:

a section (12) with a predetermined length; and

a plurality of fixing means (14) to fix the section (12) to said keel;

wherein a recess (16) longitudinally formed in said section (12); and

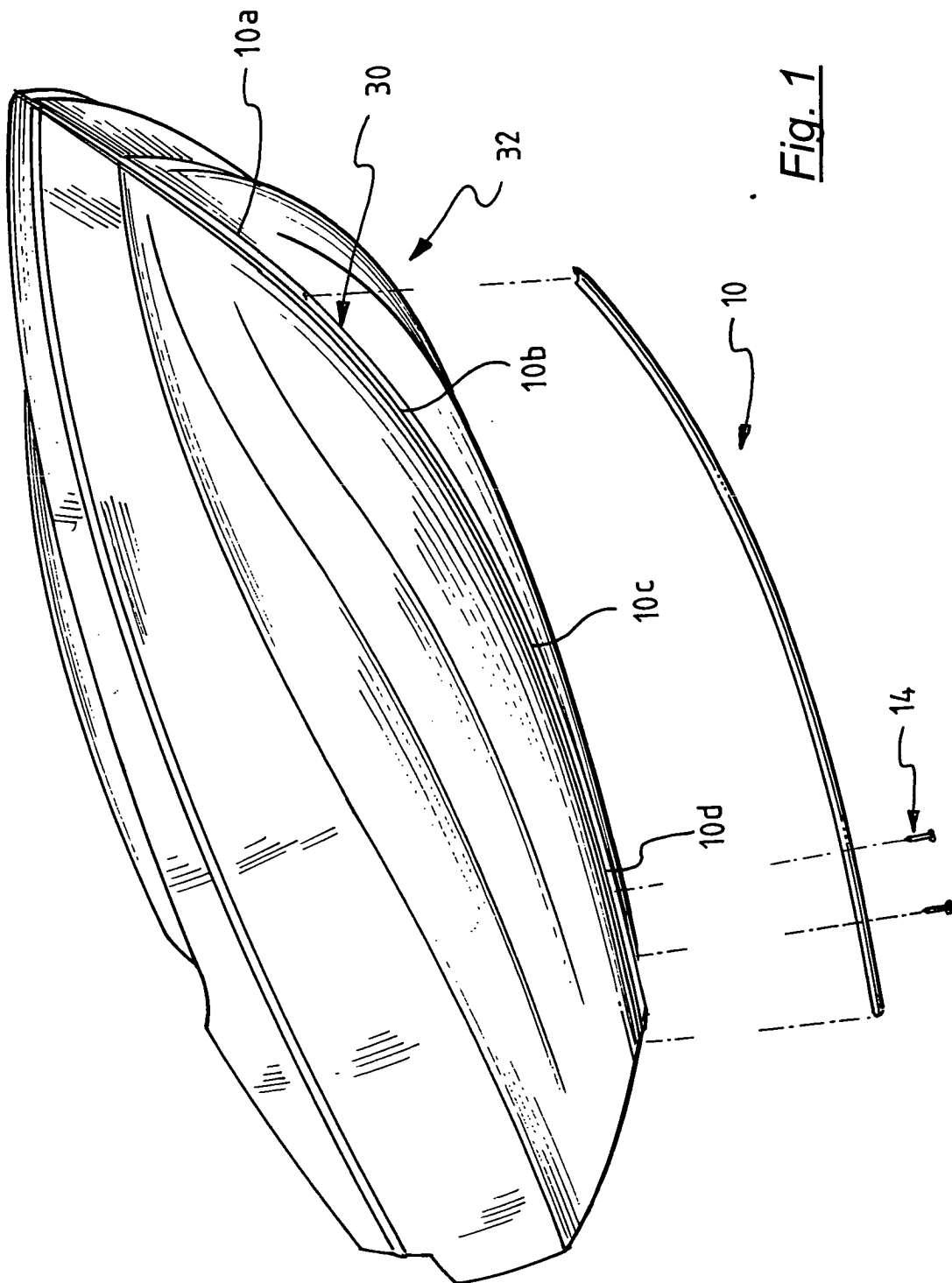
a plastic filling material (18) in at least a portion of said recess.

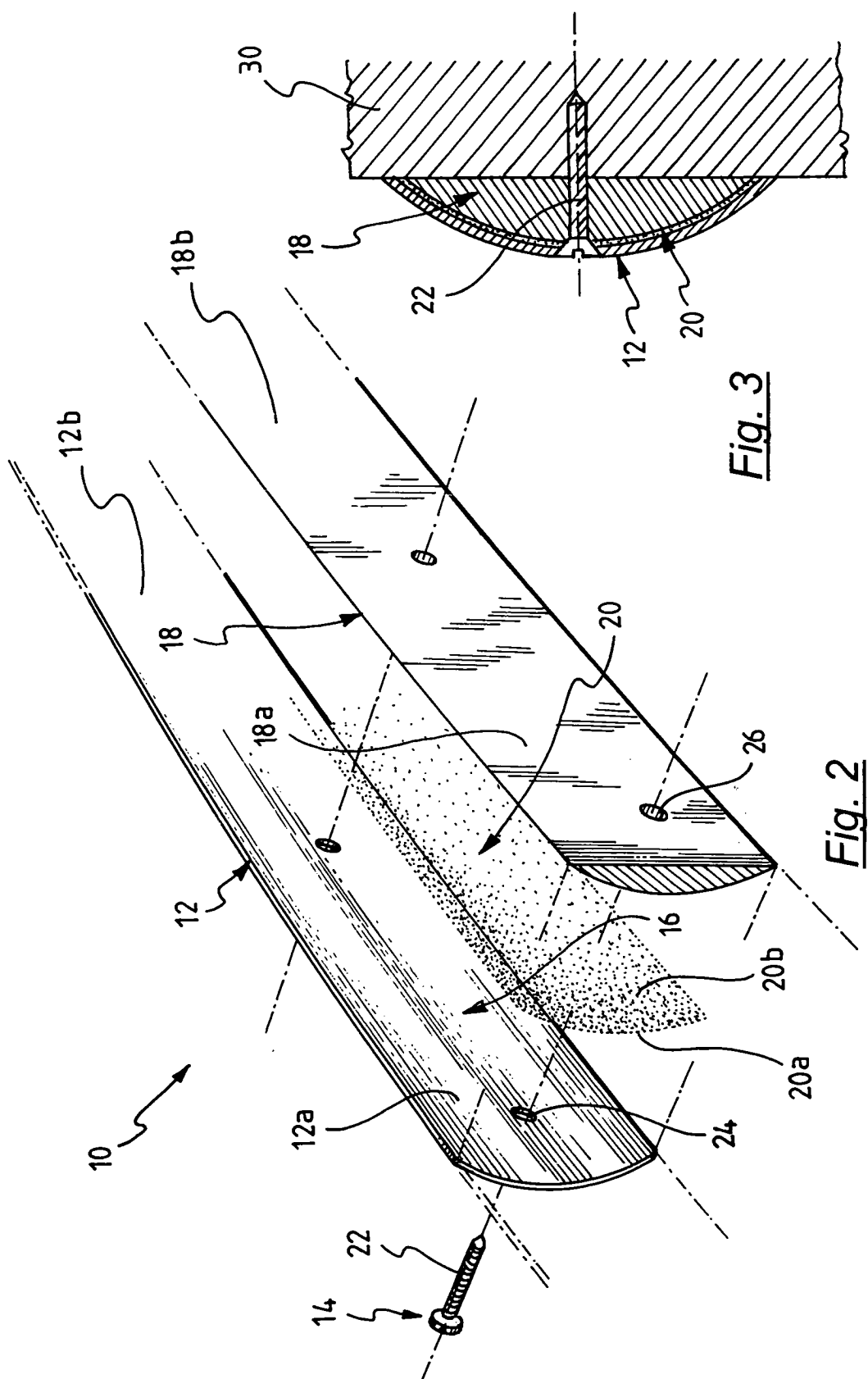
2. A protection structure according to claim 1, wherein said section (12) is formed by a steel list having a hump-like profile. 5
3. A protection structure according to claim 2, wherein said section (12) is obtained by bending starting from a rectangular-or-trapezoidal-section list, said list being equipped with at least a greater flat face with a high surface finishing. 10
4. A protection structure according to claim 1, wherein said section (12) has substantially a "C"-section. 15
5. A protection structure according to claim 1, wherein said filling material (18) is a plastic material section. 20
6. A protection structure according to claim 5, wherein said plastic material is PVC. 25
7. A protection structure according to claim 5, wherein said filling material (18) has an extrados surface (18a) that is conjugated with an intrados surface (12a) of said section (12). 30
8. A protection structure according to claim 4, wherein said filling material (12) has a circular-sector-shaped section. 35
9. A protection structure according to claim 1, wherein said section (12) and said filling material (18) are mutually constrained. 40
10. A protection structure according to claim 9, wherein said section (12) and said filling material (18) are constrained by an adhesive. 45
11. A protection structure according to claim 9, wherein said section and said filling material are constrained by an adhesive tape (20) having both adhesive sides. 50
12. A protection structure according to claim 11, wherein said section (12) and said filling material (18) undergo a compression for scavenging the possible air remained trapped. 55
13. A protection structure according to claim 1, wherein said plurality of fixing means (14) are screws (22).

14. A protection structure according to claim 13, wherein said screws (22) are self-threading and are distributed in correspondence of respective through holes (24) crossing said section (12) and said filling material (18) respectively; said screws being provided in a predetermined spaced relation one with respect to the other.

15. A protection structure according to claim 1, wherein said section is made of stainless steel.

16. A section (12) intended to be fixed to a keel (30) or to parts to be profiled of a boat (32), extending for at least a length section of the keel or said parts, including a longitudinally developing recess (16) associated to a plastic-material filling element (18).





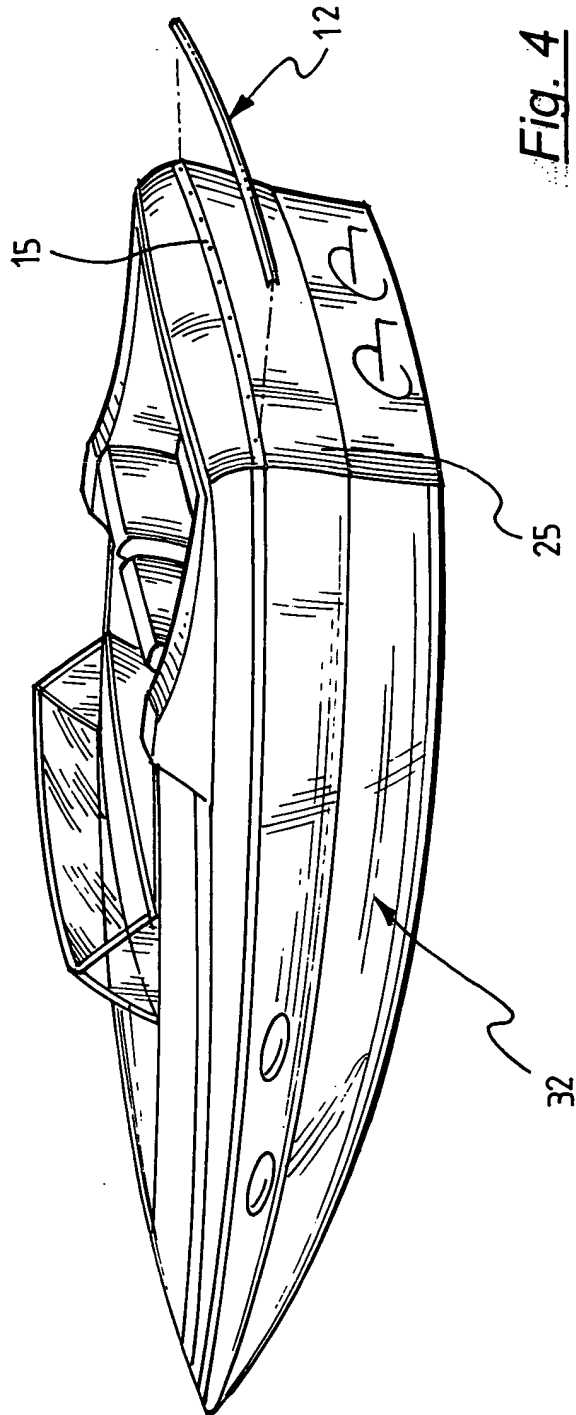


Fig. 4