(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 429 107 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **90202773.9**

(51) Int. Cl.5: **B63B 59/02**

(22) Date of filing: **17.10.90**

(30) Priority: **18.11.89 NL 8902583**

(43) Date of publication of application:
29.05.91 Bulletin 91/22

(84) Designated Contracting States:
AT BE DE DK ES FR GB GR IT NL SE

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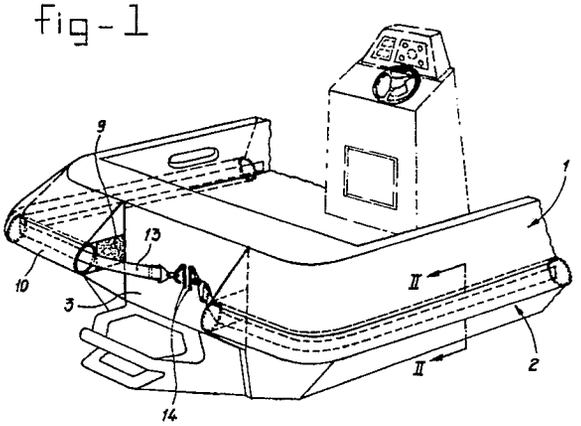
(54) Boat provided with a fender.

(57) Boat (1) provided with a fender along virtually the entire peripheral edge, which fender on the outside comprises a body of wear-resistant material with a low coefficient of friction, formed by a hollow tube (10) and on the inside comprises a body of readily deformable material, formed by a strip (9) of plastic foam, whereby a tensioning strap (13) or the like, which presses the tube (10) under pre-tension against the body (9) of plastic foam, is provided in the tube (10) and whereby the body (9) of plastic foam is incorporated entirely and the tube (10) partially in a channel (4, 5, 6) of rigid material lying on its side, which channel is connected to the peripheral edge of the boat (1).

fig-1



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BOAT PROVIDED WITH A FENDER.

The invention relates to a boat provided with a fender along virtually the entire peripheral edge, which fender on the outside comprises a body of wear-resistant material with a low coefficient of friction, and on the inside comprises a body of readily deformable material.

Such a fender is described in Dutch Patent Application 8006242, the inner body being made of a hollow rubber section and the outer body being a straight or curved strip which is integral with the rubber section.

The object of the outer body of wear-resistant material with a low coefficient of friction is to protect the rubber section in the event of a collision or the like. Without this protective layer, there is a chance of the rubber curling back. A fender is required in particular in the case of fast boats, for example pilot boats by means of which pilots are taken from and to seagoing vessels. However, a fender system is also desirable for other boats.

This known fender was not satisfactory in practice. The object of the invention is to provide a boat with fender which meets all requirements and is also cheap.

This is achieved according to the invention through the fact that the body of wear-resistant material with a low coefficient of friction is formed by a hollow tube, and by the fact that the body of readily deformable material is formed by a strip of plastic foam, a tensioning strap or the like, which presses the tube under pre-tension against the body of plastic foam, being provided in the tube, and the body of plastic foam being incorporated entirely and the tube partially in a channel of rigid material lying on its side, which channel is fixed to the peripheral edge of the boat. The fender system according to the invention is based on a combination of two plastic parts, i.e. a thick-walled tube, for example of rigid polyethylene, and a mass, for example of foamed polethylene or polyvinyl.

In this combination the tube acts as the sealing strip and through its round tubular shape as a shock absorber.

The foam block lying behind this acts purely as the shock-absorbing element.

The rigid housing inside which the two materials are situated is selected in such a way that the plastic tube can move only in one direction.

The through-running tensioning cable or tensioning strap or other tensioning device ensures that the tube cannot fall out of the housing.

The housing in which the fender package is situated is protected by two slanting faces, one above and one below the channel, which form part of the ship's structure and are clad with a plastic sheet material, as a result of which obstacles which threaten to come into contact with the boat in the vertical direction can slide off.

The ultimate shock-absorbing effect of the system in the lateral direction is therefore obtained through flexibility of the tube, on the one hand, and the elasticity of a foam block, on the other.

Through the use of foam blocks with different height/width ratios, or through the use of a foam with a different specific mass, the absorption characteristic can be adapted to the use circumstances and the weight of the boat.

The invention will be explained in greater detail with reference to the drawing, in which:

Fig. 1 is a perspective rear view of a boat, provided with a fender according to the invention; and

Fig. 2 is a cross-section of the fender along the line II-II of Fig. 1.

The boat 1, such as a pilot boat, is provided all the way round with an aluminium housing 2, except at the position of the centre of the stern 3.

The cross-sectional shape of the aluminium housing 2 can best be seen from Fig. 2.

It is composed of an essentially vertically running sheet 4 of aluminium or the like, which is fixed to the boat structure by means of arms 4a and 4b. Sheets 5 and 6 and slanting sheets 7 and 8 run at right angles to the sheet 4.

The sheets 4, 5 and 7 and the sheets 4, 6 and 8 form triangles, due to the fact that the various sheets are interconnected to a rigid whole, for example by welding. This housing runs all the way around the boat, but is interrupted at the centre of the stern 3.

The sheets 4, 5 and 6 form a channel lying on its side and rectangular in shape, in which a block of plastic 9 and a slightly flexible tube 10 of rigid polyethylene or the like is placed.

The aluminium sheets 7 and 8 are also clad with such a rigid plastic layer 11 and 12 respectively.

A tensioning strap, wire or chain, indicated by 13, runs through the interior of the tube 10, which is interrupted near the centre of the stern 3.

The ends of this tensioning strap 13 are connected to each other and tensioned near the centre of the stern 3 by means of tensioning means 14.

The tube 10 running around the boat 1 thus exerts a certain tension on the strip 9 of plastic foam which is rectangular in cross-section.

If there is a slight collision against the boat, the smooth tube 10, as it were, slides along the obstacle without damaging. Moreover, the tube 10 can deform slightly and transmit the force of the

impact to the plastic foam 9.

The rigid claddings 11 and 12 also ensure that the edge of the boat 1 glides along below or above any obstacle.

The spaces bounded by the sheets 4, 5 and 7 and 4, 6 and 8 also form buoyancy boxes.

As an example, the tube 10 has an external diameter of 125 mm and a wall thickness of 16 mm and is made of rigid polyethylene. The body 9 of plastic foam preferably has a height of 125 mm and a thickness of 75 mm, and is preferably made of polyethylene or polyvinyl foam with closed cells.

The claddings 11 and 12 are preferably made of rigid polyethylene and are, for example, 5 mm thick.

It is clear that the measurements depend on the size of the boat. The material can also be changed if necessary.

Claims

1.Boat provided with a fender along virtually the entire peripheral edge, which fender on the outside comprises a body of wear-resistant material with a low coefficient of friction, and on the inside comprises a body of readily deformable material,- **characterized in that** the body of wear-resistant material with a low coefficient of friction is formed by a hollow tube, and the body of readily deformable material is formed by a strip of plastic foam, a tensioning strap or the like, which presses the tube under pre-tension against the body of plastic foam, being provided in the tube, and the body of plastic foam being incorporated entirely and the tube partially in a channel of rigid material lying on its side, which channel is connected to the peripheral edge of the boat.

2.Boat according to Claim 1, **characterized in that** the tube is made of rigid polyethylene.

3.Boat according to Claim 1 or 2, **characterized in that** the tube projects beyond the channel along approximately half its periphery.

4.Boat according to Claim 1, 2 or 3, **characterized in that** the body of plastic foam is formed by polethylene or polyvinyl with closed cells.

5.Boat according to Claim 4, **characterized in that** the body of plastic foam has a rectangular cross-section.

6.Boat according to one or more of the preceding Claims, **characterized in that** the bottom of the channel is formed by an essentially vertically running metal sheet which is rigidly connected to the peripheral edge of the boat, and each wall of the channel is formed by an essentially horizontally running metal sheet which at one end is rigidly connected to the vertical metal sheet and at the other end to a sloping metal sheet, which in turn is rigidly connected to the vertical metal sheet.

7.Boat according to Claim 6, **characterized in that** the two sloping metal sheets are clad with sheets of wear-resistant material with a low coefficient of friction.

8.Boat according to Claim 6 or 7, **characterized in that** the metal sheets above and below the channel form air chambers of triangular cross-section.

fig-1

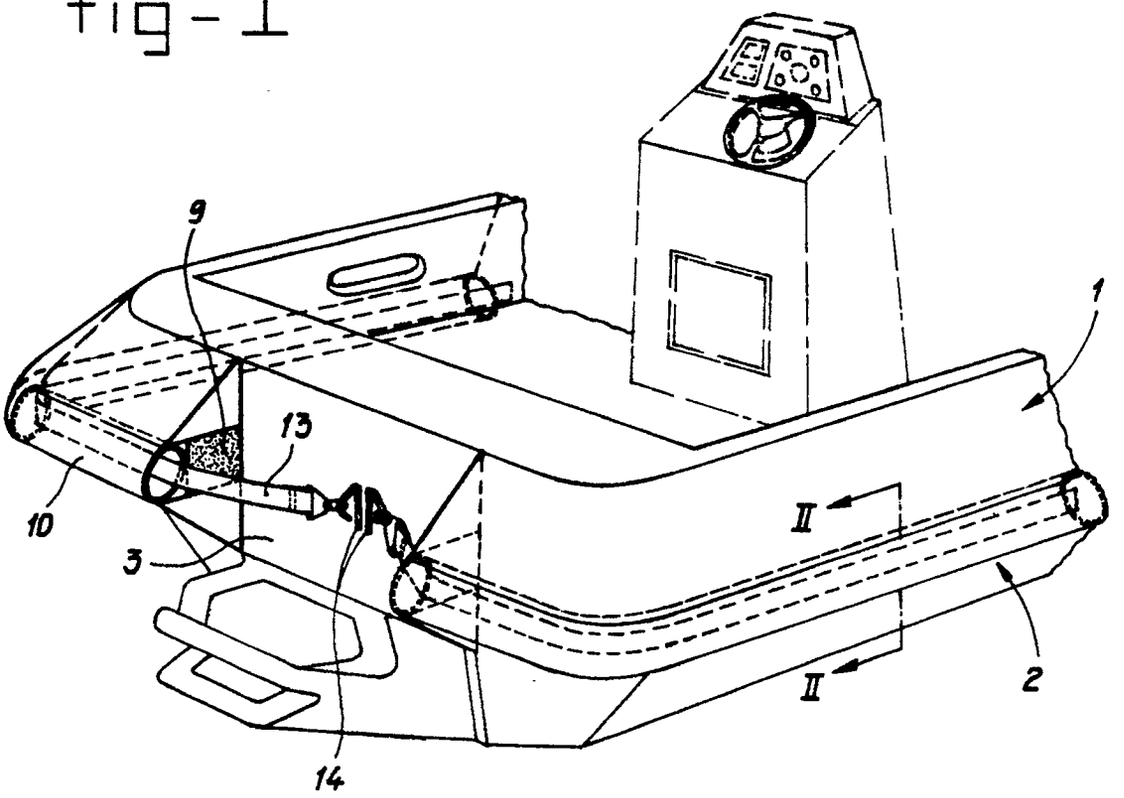
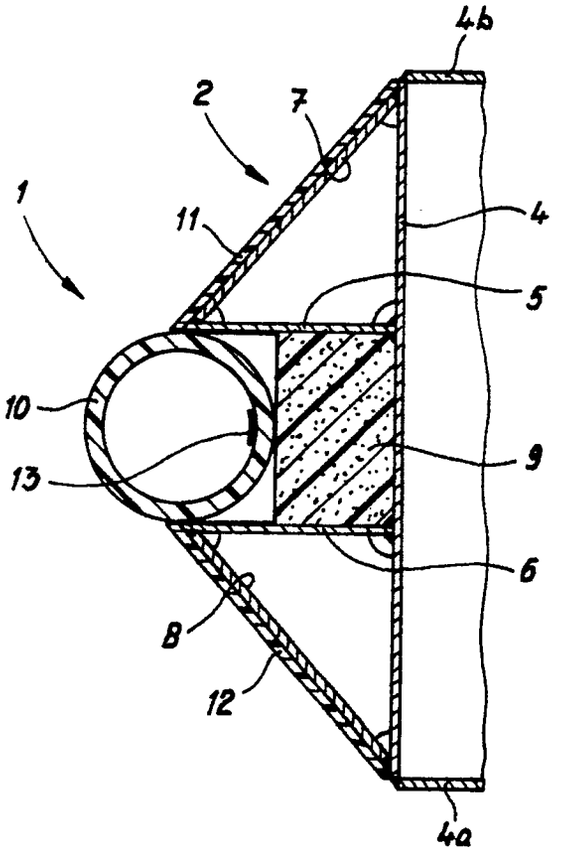


fig-2



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EUROPEAN SEARCH REPORT

Application Number

EP 90 20 2773

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y	US-A-2 117 121 (URQUHART) * Page 1, lines 15-31; figures 7,8,11 *	1	B 63 B 59/02
Y	GB-A-9 468 11 (BALDWIN-MONTROSE) * Page 1, line 85 - page 2, line 39; figures 1-4 *	1	
A,D	NL-A-8 006 242 (KON. BAKKER RUBBERFABRIK)		
A	FR-A-2 358 512 (SEA TANK)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 63 B
E 02 B

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	19 December 90	DE SCHEPPER H.P.H.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
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