APPLICATION FOR A STANDARD PATENT

I/We
Bluewater Terminal Systems N.V.
of
Theaterstraat 17, Willemstad, Curacao, Netherlands Antilles

hereby apply for the grant of a Standard Patent for an invention entitled:

Stand-off mooring system

which is described in the accompanying complete specification.

Details of basic application(s):

<table>
<thead>
<tr>
<th>Number</th>
<th>Convention Country</th>
<th>Date</th>
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<tbody>
<tr>
<td>9000363</td>
<td>The Netherlands</td>
<td>15 February 1990</td>
</tr>
</tbody>
</table>

The address for service is care of DAVIES & COLLISON, Patent Attorneys, of 1 Little Collins Street, Melbourne, in the State of Victoria, Commonwealth of Australia.

DATED this FOURTEENTH day of FEBRUARY 1991

To: THE COMMISSIONER OF PATENTS

[Signature]

a member of the firm of DAVIES & COLLISON for and on behalf of the applicant(s)

Davies & Collison, Melbourne
In support of the Application made for a patent for an invention
entitled: "STAND-OFF MOORING SYSTEM"

1. (a) I Willem Jan van Heijst
(b) I am authorized by
Bluewater Terminal Systems N.V.
of Theaterstraat 17
Willemsstad, Curacao
Netherlands Antilles

I do solemnly and sincerely declare as follows:-

1. (a) I am authorized by
Bluewater Terminal Systems N.V.
the applicant,............ for the patent to make this declaration on its behalf.

2. (a) I Jacob de Baan
(b) I am not an inventor;
the applicant,............ for the patent to make this declaration on its behalf.

State manner in which applicant(s) derive title from inventor(s)

3. The basic application............ as defined by Section 141 of the Act was
made in The Netherlands............ on the 15th of February 1990
by Bluewater Terminal Systems N.V..................

4. The basic application............ referred to in paragraph 3 of this Declaration was
the first application............ made in a Convention country in respect of the invention the subject
of the application............ made in a Convention country in respect of the invention

Declared at Willemstad this 10th February 1991

Willem Jan van HEIJST
(Director)
STAND-OFF MOORING SYSTEM

1. Mooring system for a vessel, comprising a structure anchored to the seabed with at its upper end a turntable to which the vessel is moored by means of a hawser connected to one end of the vessel, characterized by an outrigger, projecting from this vessel end in essentially the longitudinal direction thereof which is at its end near to the buoy provided with a guide for a flexible tension member such as a wire or cable of which one end is connected to the anchored structure and of which the other end is connected to means which generate a tensive force in said member.
COMMONWEALTH OF AUSTRALIA
PATENTS ACT 1952
COMPLETE SPECIFICATION

NAME & ADDRESS
OF APPLICANT:
Bluewater Terminal Systems N.V.
Theaterstraat 17
Willemstad Curacao
Netherlands Antilles

NAME(S) OF INVENTOR(S):
Jacob de BAAN

ADDRESS FOR SERVICE:
DAVIES & COLLISON
Patent Attorneys
1 Little Collins Street, Melbourne, 3000.

COMPLETE SPECIFICATION FOR THE INVENTION ENTITLED:
Stand-off mooring system

The following statement is a full description of this invention, including the best method of performing it known to me/us:-
The invention relates to a mooring system for a vessel, comprising a structure which is anchored to the seabed, and with on top thereof a turntable to which the vessel is moored by a hawser connected to one end of the vessel.

Such a simple and easy to use mooring system is often used when it is no disadvantage that the vessel can, under the influence of the prevailing wind, swing around the anchored structure ("weather-vaning"), but does have the disadvantage of the danger that the vessel, under the influence of wind, current or wave comes into contact with the mooring structure.

The invention aims to obviate this drawback with simple means which can be installed on each vessel. According to the invention this is obtained in that an outrigger, projecting from this vessel end in essentially the longitudinal direction thereof which is at its end near to the buoy provided with a guide for a flexible tension member such as a wire or cable of which one end is connected to the anchored structure and of which the other end is connected to means which generate a tensive force in said member.

At rest the guide at the end of the outrigger will lie practically straight above the mooring structure so that no longitudinal forces will be exerted on the outrigger. However, when the outrigger moves to or from the mooring structure the part of the flexible tension member between the guide and the mooring structure will include an angle with the vertical so that reset forces are generated which result into a restoration of the original situation. In this way it is prevented with simple means that the vessel comes into contact with the mooring structure.

Preferably the means are constituted by a weight and is the embodiment of the mooring system such that the tension member is guided along the outrigger to above the deck of the vessel and from there over a guide near to the rail, in
such a way that the weight is positioned next to the ves-

sel.

The guides can consist of sheaves while the sheave at
the end of the outrigger can rotate around a horizontal and
a vertical axis.

Embodiments of the invention are described in the
claims 6-9.

The anchored structure can be, as is known in itself, a
floating buoy, anchored by means of chains or cables to the
seabed.

The invention is elucidated on the hand of the dra-
wings. Herein are:

figures 1a, 1b and 1c schematic views to elucidate the
way in which the mooring system according to the invention
operates;

figure 2 is a perspective schematic view of a practical
embodiment thereof.

In the drawing 2 denotes a vessel, such as a tanker,
which is moored by means of a hawser to the turntable 6 of
a mooring structure which is anchored to the seabed. This
comprises a floating buoy 8 anchored to the seabed by means
of cables or chains 10. Such a mooring method is commonly
known but has the disadvantages as described in the intro-
duction.

To obviate these the vessel 12 carries, according to
the invention, an outrigger 14 with at the first end 16 a
suitable guide, such as a sheave for a flexible tension
member 20 - such as a cable or chain - of which the first
end 22 is fixed to a suitable fastening bracket 24 on the
buoy 8. The second end 26 of the cable is fastened to a
schematically shown device 28 for generating a tensive
force T. This device may consist of a free-hanging weight,
a winch or a spring; in the latter case the tensive force
can also be supplied by the elasticity of the flexible
element. The bracket 30 of the foremost sheave 18 can
rotate around the horizontal axis 32 and the vertical axis
34.
In the position as shown in figure 1a the end 16 of the outrigger 14 lies essentially above the buoy 8 so that only a downwardly directed force P is exerted on this end 16, equal to the force T. However, when the vessel 2 moves towards the buoy 8 the situation according to figure 1b is obtained in which a resetting force P₁, equal to Pₛ𝑖𝑛α, is exerted at the end 16. This resetting force tends to move the vessel 2 away from the buoy 8, with which the envisaged effect is obtained.

A similar situation is obtained when the vessel moves away from the buoy: then a resetting force P₂, equal to Pₛ𝑖𝑛β, is exerted on the outrigger 14.

Figure 2 shows in a perspective view a practical embodiment using a dead weight. The cable 20 is guided over a sheave 36 with horizontal axis 38 on the deck of the vessel 2; furthermore there is a second guide for the cable 20, namely a sheave 42 which can rotate around the horizontal axis 40 and is positioned next to the rail. The weight 28 is composed of a number of anchor chains 44.

To free the vessel from the mooring one only has to take the chains 44 on board and disconnect the rope 20 and the hawser 4. When the hawser 4 breaks and the vessel 2 moves away from the buoy then the chains 44 are hauled upwardly until they meet an abutment (not shown); the connection of the end 22 to the buoy 8 contains a safety pin (not shown) which breaks at a predetermined load so that damage to the outrigger structure 14 by excessive loads is prevented.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Mooring system for a vessel, comprising a structure anchored to the seabed with at its upper end a turntable to which the vessel is moored by means of a hawser connected to one end of the vessel, characterized by an outrigger, projecting from this vessel end in essentially the longitudinal direction thereof which is at its end near to the buoy provided with a guide for a flexible tension member such as a wire or cable of which one end is connected to the anchored structure and of which the other end is connected to means which generate a tensive force in said member.

2. Mooring system according to claim 1, characterized in that these means are constituted by a suspended weight, moveable in a vertical direction.

3. Mooring device according to claim 2, characterized in that the tension member is guided along the outrigger to above the vessel deck, and from there to a guide near to the railing thereof, in such a way that the weight is positioned next to the vessel.

4. Mooring system according to claim 1-3, characterized in that the guides are sheaves.

5. Mooring system according to claim 4, characterized in that the sheave at the end of the outrigger can rotate around a horizontal and vertical axis.

6. Mooring system according to claim 1-5, characterized in that the weight comprises one or more chains.

7. Mooring system according to claim 1, characterized in that the means are constituted by a winch.

8. Mooring device according to claim 1, characterized in that the means are constituted by a spring.

9. Mooring system according to claim 8, characterized in that the spring is constituted by the own elasticity of the tension member.

10. Mooring system according to claim 1-9, characterized in that the anchored system is constituted by a floating buoy.
11. A mooring system substantially as hereinbefore described with reference to the drawings.

12. The steps, features, compositions and compounds disclosed herein or referred to or indicated in the specification and/or claims of this application, individually or collectively, and any and all combinations of any two or more of said steps or features.

DATED this FOURTEENTH day of FEBRUARY 1991

Bluewater Terminal Systems N.V.

by DAVIES & COLLISON
Patent Attorneys for the applicant(s)