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(54) Steering system for sailing vessels

(57) A steering system for a yacht including a rudder and a user steering interface such as a wheel or tiller is described. The steering system comprising:
a drive unit connected with the rudder to control the angle of the rudder relative to the yacht hull,
a sensor for sensing the position or movement of the user

steering interface,
a controller activating the drive unit to control the angle of the rudder according to the output of the sensor,
a feedback system that senses the rotation load on the rudder and applies a feedback force to the user steering interface that is a non-linear function of the rudder load.

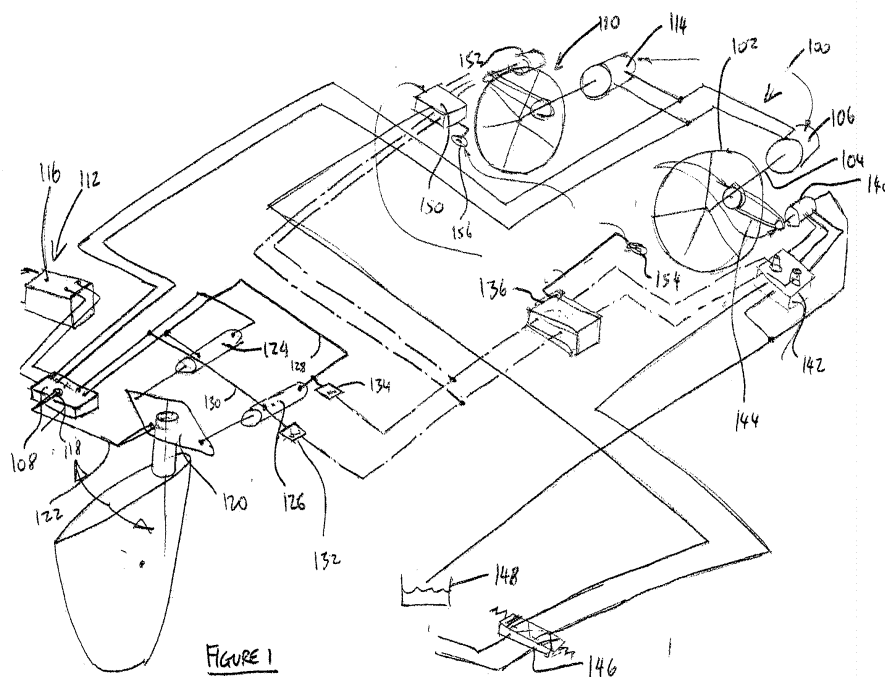


FIGURE 1

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EUROPEAN SEARCH REPORT

Application Number
EP 11 16 6398

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2008/115711 A1 (MIZUTANI MAKOTO [JP]) 22 May 2008 (2008-05-22) * abstract * * paragraphs [0003] - [0006], [0029], [0032], [0038], [0045], [0065], [0066] * * figures 1, 3, 5, 8b *	1-3	INV. B63H25/02 B63H25/18
X	US 2005/199168 A1 (MIZUTANI MAKOTO [JP]) 15 September 2005 (2005-09-15) * abstract * * paragraphs [0026] - [0030] * * figures 1, 2 *	1	
A	JP 2004 155282 A (KOYO SEIKO CO) 3 June 2004 (2004-06-03) * abstract *	1	
A	EP 0 416 266 A1 (BOSCH GMBH ROBERT [DE]) 13 March 1991 (1991-03-13) * abstract * * figure 2 *	1,2	
			TECHNICAL FIELDS SEARCHED (IPC)
			B63H B62D
<p>1 The present search report has been drawn up for all claims</p>			
Place of search Munich		Date of completion of the search 31 October 2011	Examiner Weber, Ingo
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-3(completely); 13(partially)

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3(completely); 13(partially)

Steering system with a feedback system that applies a feedback force that is a non-linear function of the rudder load.

2. claims: 4, 5(completely); 13(partially)

Steering system with a feedback system that allows activating or deactivating the feedback system.

3. claims: 6(completely); 13(partially)

Steering system comprising a controller controlling the the rudder actuators with input from particular sensors and actuators.

4. claims: 7-12, 14, 15(completely); 13(partially)

Steering system comprising a hydraulic feedback motor connected to the user steering interface.

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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31-10-2011

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