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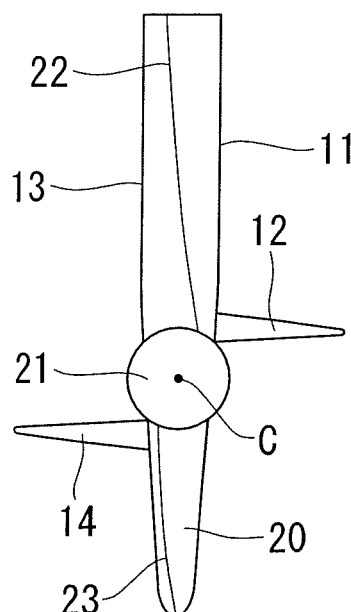
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(54) **Finned rudder**

(57) A fin that generates thrust in the forward motion direction by utilizing rising, falling, and swirling flows near a rudder surface is attached to a rudder to improve the propulsion performance. The invention provides a finned rudder, disposed aftward of a screw propeller that rotates clockwise as viewed from the stern side during forward motion, for changing the course of a ship and provided with a first fin and a second fin in respective rudder surfaces. A first end of the first fin is attached at a position higher than a center position of the screw propeller on a leading edge side of a central portion of the rudder surface, and a first end of the second fin is attached at a position lower than the center position of the screw propeller on the leading edge side of the central portion of the rudder surface. A second end of the first fin extends at an upward inclination to a position inside the rotation radius of the screw propeller where the upward flow is strong, and a second end of the second fin extends horizontally to a position inside the rotation radius of the screw propeller where the downward flow is strong.

FIG. 7





EUROPEAN SEARCH REPORT

Application Number
EP 09 15 2042

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,D	JP 11 139395 A (KAWASAKI HEAVY IND LTD) 25 May 1999 (1999-05-25)	1,3-5	INV. B63H25/38 B63H25/52
A	* figures 1,6b *	2	
X	----- EP 0 472 811 A1 (NIPPON KOKAN KK [JP]) 4 March 1992 (1992-03-04) * figure 5c *	1,5	
X	----- JP 4 043192 A (HITACHI SHIPBUILDING ENG CO) 13 February 1992 (1992-02-13) * figures *	1,5	
A	----- JP 61 278499 A (ISHIKAWAJIMA HARIMA HEAVY IND) 9 December 1986 (1986-12-09) * figures 1,2,3,6 *	1,2,5	
A,D	----- JP 6 305487 A (HITACHI SHIPBUILDING ENG CO) 1 November 1994 (1994-11-01) * figure 4 *	1,2,5	
A	----- WO 2006/115317 A1 (HYUN DAI HEAVY IND CO LTD [KR]; MIN KEH-SIK [KR]; CHANG BONG-JUN [KR];) 2 November 2006 (2006-11-02) * figures 1,2, *	1,2,5	TECHNICAL FIELDS SEARCHED (IPC)
A	----- EP 0 527 270 A1 (HITACHI SHIPBUILDING ENG CO [JP]) 17 February 1993 (1993-02-17) * figures 1,15 *	1,2,5	B63H
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 26 August 2011	Examiner van Rooij, Michael
CATEGORY OF CITED DOCUMENTS 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		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	

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

EP 09 15 2042

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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26-08-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 11139395 A	25-05-1999	JP 3004238 B2	31-01-2000
EP 0472811 A1	04-03-1992	DE 69104931 D1	08-12-1994
		DE 69104931 T2	13-04-1995
		JP 4085194 A	18-03-1992
		NO 911693 A	28-01-1992
		US 5231947 A	03-08-1993
JP 4043192 A	13-02-1992	NONE	
JP 61278499 A	09-12-1986	NONE	
JP 6305487 A	01-11-1994	NONE	
WO 2006115317 A1	02-11-2006	CN 101189159 A	28-05-2008
		EP 1877301 A1	16-01-2008
		JP 2008536760 A	11-09-2008
		US 2008066669 A1	20-03-2008
EP 0527270 A1	17-02-1993	DE 69110040 D1	29-06-1995
		DE 69110040 T2	23-11-1995
		DK 0527270 T3	02-10-1995
		ES 2075336 T3	01-10-1995
		JP 5039090 A	19-02-1993