



- | | |
|---|---|
| (51) International Patent Classification:
<i>F03B 13/26</i> (2006.01) | (74) Agent: CHAPMAN, Molony; Cardiff Business Technology Centre, Senghennydd Road, Cardiff South Wales CF24 4AY (GB). |
| (21) International Application Number:
PCT/GB2009/050565 | (81) Designated States (<i>unless otherwise indicated, for every kind of national protection available</i>): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW. |
| (22) International Filing Date:
26 May 2009 (26.05.2009) | (84) Designated States (<i>unless otherwise indicated, for every kind of regional protection available</i>): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG). |
| (25) Filing Language:
English | |
| (26) Publication Language:
English | |
| (30) Priority Data:
0809421.1 27 May 2008 (27.05.2008) GB
0809900.4 2 June 2008 (02.06.2008) GB
0810508.2 10 June 2008 (10.06.2008) GB
0819555.4 27 October 2008 (27.10.2008) GB
0902414.2 16 February 2009 (16.02.2009) GB | |
| (71) Applicant (<i>for all designated States except US</i>): MA-RINE POWER SYSTEMS LIMITED [GB/GB]; 27, Downleaze, Cockett, Swansea South Wales SA2 0GQ (GB). | |
| (72) Inventors; and | |
| (75) Inventors/Applicants (<i>for US only</i>): FOSTER, Graham [GB/GB]; 27, Downleaze, Cockett, Swansea South Wales SA2 0GQ (GB). STOCKMAN, Gareth Ian [GB/GB]; 27, Edgware Road, Uplands, Swansea South Wales SA2 0NA (GB). | |
| (73) Owner (<i>for US only</i>): FOSTER, Graham [GB/GB]; 27, Downleaze, Cockett, Swansea South Wales SA2 0GQ (GB). | |
| (74) Agent: CHAPMAN, Molony; Cardiff Business Technology Centre, Senghennydd Road, Cardiff South Wales CF24 4AY (GB). | |
| (21) International Application Number:
PCT/GB2009/050565 | |
| (22) International Filing Date:
26 May 2009 (26.05.2009) | |
| (25) Filing Language:
English | |
| (26) Publication Language:
English | |
| (30) Priority Data:
0809421.1 27 May 2008 (27.05.2008) GB
0809900.4 2 June 2008 (02.06.2008) GB
0810508.2 10 June 2008 (10.06.2008) GB
0819555.4 27 October 2008 (27.10.2008) GB
0902414.2 16 February 2009 (16.02.2009) GB | |
| (71) Applicant (<i>for all designated States except US</i>): MA-RINE POWER SYSTEMS LIMITED [GB/GB]; 27, Downleaze, Cockett, Swansea South Wales SA2 0GQ (GB). | |
| (72) Inventors; and | |
| (75) Inventors/Applicants (<i>for US only</i>): FOSTER, Graham [GB/GB]; 27, Downleaze, Cockett, Swansea South Wales SA2 0GQ (GB). STOCKMAN, Gareth Ian [GB/GB]; 27, Edgware Road, Uplands, Swansea South Wales SA2 0NA (GB). | |

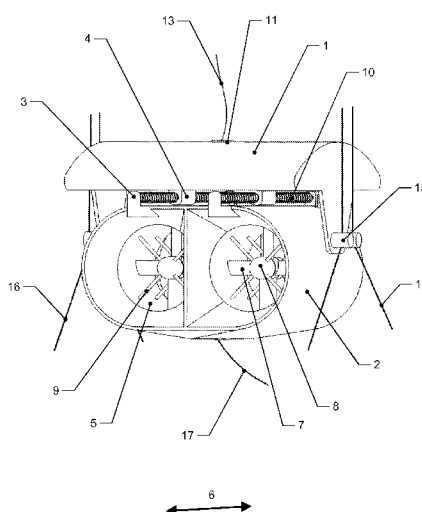
Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

[Continued on next page]

- (54) Title:** SUBMERSIBLE TURBINE APPARATUS

Figure 4



- (57) Abstract:** The apparatus comprises a turbine to be driven when submerged in a current of water; lift means for generating a lift force upon the turbine means when the turbine is submerged in the current; securing means for securing the apparatus to a tether; and stabilising means for dynamically stabilising the apparatus in a first configuration in the current when the current flows in a first direction, and in a second configuration when the current flows in a second different direction. The geometrical relationship between the securing means, the centre of drag on the apparatus and the centre of lift of the apparatus in the first configuration is different to the corresponding geometrical relationship in the second configuration.



(88) Date of publication of the international search report:

25 November 2010

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2009/050565

A. CLASSIFICATION OF SUBJECT MATTER
INV. F03B13/26
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F03B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/42318 A1 (DEHLSSEN ASSOCIATES INC [US]; DEHLSSEN JAMES G P [US]; DEHLSSEN JAMES B []) 20 July 2000 (2000-07-20) * abstract page 3, line 25 - page 11, line 12 claims figures	1-21
X	US 2002/158472 A1 (ROBSON JOHN H [US]) 31 October 2002 (2002-10-31) * abstract paragraphs [0046] - [0054] paragraphs [0089] - [0125] figures claims ----- -/-	1-21

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

8 October 2010

Date of mailing of the international search report

15/10/2010

Name and mailing address of the ISA/
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Rini, Pietro

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2009/050565

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2007/100639 A2 (KUEHNLE MANFRED R [US]) 7 September 2007 (2007-09-07) * abstract page 12, line 11 - page 14, line 11 figures claims -----	1-21
X	US 2007/284882 A1 (COSTIN DANIEL P [US]) 13 December 2007 (2007-12-13) * abstract paragraphs [0009] - [0013] paragraphs [0024] - [0044] claims figures -----	1-21
X	US 7 291 936 B1 (ROBSON JOHN H [US]) 6 November 2007 (2007-11-06) column 9, line 46 - column 13, line 8 column 14, line 10 - column 29, line 45 figures -----	1-21
X	US 2008/050993 A1 (MACKIE GRAEME C [GB] MACKIE GRAEME CHARLES [GB]) 28 February 2008 (2008-02-28) paragraphs [0032] - [0045] figures claims -----	1-21

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2009/050565

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0042318	A1	20-07-2000	AU 2611900 A 01-08-2000
			EP 1144864 A1 17-10-2001
			JP 2002535188 T 22-10-2002
US 2002158472	A1	31-10-2002	NONE
WO 2007100639	A2	07-09-2007	NONE
US 2007284882	A1	13-12-2007	US 2009167022 A1 02-07-2009
			US 2010253078 A1 07-10-2010
US 7291936	B1	06-11-2007	WO 2007130479 A2 15-11-2007
US 2008050993	A1	28-02-2008	EP 1815133 A1 08-08-2007
			GB 2422878 A 09-08-2006
			WO 2006054084 A1 26-05-2006
			ZA 200703743 A 30-07-2008