## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

# (19) World Intellectual Property Organization International Bureau



# 

# (43) International Publication Date 14 December 2006 (14.12.2006)

# (10) International Publication Number WO 2006/133122 A3

(51) International Patent Classification: *F03D 9/02* (2006.01)

(21) International Application Number:

PCT/US2006/021791

(22) **International Filing Date:** 5 June 2006 (05.06.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 60/687,622

3 June 2005 (03.06.2005) US

(71) Applicant (for all designated States except US): CLEVE-LAND STATE UNIVERSITY [US/US]; Keith Building, Suite 1150, 2121 Euclid Avenue, Cleveland, OH 44115 (US).

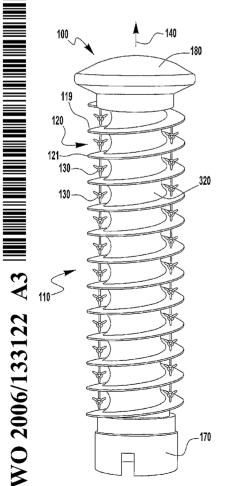
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): RASHIDI, Majid

[US/US]; 33626 Lombardy Lane, Pepper Pike, OH 44124 (US).

- (74) Agent: MUELLER, Andrew, J.; CALFEE, HALTER & GRISWOLD LLP, 1400 McDonald Investment Center, 800 Superior Avenue, Cleveland, OH 44114-2688 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): 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),

[Continued on next page]

## (54) Title: WIND HARNESSING SYSTEM



(57) Abstract: A wind harnessing system comprises a substantially helical structure including at least a portion of a spiraling groove and at least one energy converter positioned at least partially within the portion of the spiraling groove. In other embodiments, wind grooves formed by adjacent bands which are fixed with respect to one another, carry energy converters which are moveable with respect to these fixed bands.

# WO 2006/133122 A3



European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

## Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

## INTERNATIONAL SEARCH REPORT

International application No. PCT/US06/21791

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - F03D 9/02 (2006.01)

USPC - 415/4.5

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)

IPC(8) - F03D 1/04, 1/06, 3/06, 5/06, 9/02, F03B 3/12 (2006.01)

USPC - 415/1, 4.2, 4.3, 4.4, 4.5, 290/44, 55, 416/80, 82

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 practicable, search terms used)

USPTO EAST System (US, USPG-PUB, EPO, DERWENT), MicroPatent, IP.com, DialogPro, IEEE

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	
Х	US 4,421,452 A (ROUGEMONT) 20 December 1983 (20.12.83) entire document	1-5, 8, 12, 17-20	
Α	US 2002/0180216 A1 (MCDAVID) 05 December 2002 (05.12.2002) 1-20		
Α	US 4,236,083 A (KENNEY) 25 November 1980 (25.11.1980) entire document 1-20		
Α	US 6,132,172 A (LI) 17 October 2000 (17.10.2000) entire document	1-20	
Α	US 5,313,103 A (HICKEY) 17 May 1994 (17.05.1994) entire document	1-20	
Α	US 5,137,417 A (LUND) 11 August 1992 (11.08.1992) entire document	1-20	
Α	US 6,626,638 B2 (ROSEFSKY) 30 September 2003 (30.09.2003) entire document	1-20	
Α	US 4,725,194 A (BARTSCH) 16 February 1998 (16.02.1998) entire document	1-20	
Α	US 6,158,953 A (LAMONT) 12 December 2000 (12.12.2000) entire document	1-20	
Α	WO 2002/084115 A1 (HUANG) 24 October 2002 (24.10.2002) see abstract	1-20	
,,			

Further documents are listed in the continuation of Box C.				
* "A"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance	" 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		
"E"	earlier application or patent but published on or after the international filing date	considered novel or cannot be considered to involve an inventive		
"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)	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		
"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	"&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report		
06 November 2006		<b>12</b> FEB 2007		
Nam	ne and mailing address of the ISA/US	Authorized officer:		
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450		Blaine R. Copenheaver		
Facsimile No. 571-273-3201		PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774		
70000				