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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
9 October 2014 (09.10.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/163673 A3

(51) International Patent Classification:
F01D 5/14 (2006.01)

(21) International Application Number:
PCT/US2013/072315

(22) International Filing Date:
27 November 2013 (27.11.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/776,752 11 March 2013 (11.03.2013) US

(72) Inventors; and
(71) Applicants : **POWER, Bronwyn** [US/US]; 1518 Redsunset Drive, Brownsburg, Indiana 46112 (US). **FULAYTER, Roy David** [US/US]; 1129 Red Dunes Run, Avon, Indiana 46123 (US). **RIVERS, Jonathan M.** [US/US]; 8174 Admirals Landing Place, Indianapolis, Indiana 46236 (US).

(74) Agents: **SWEENEY, III, James R.** et al.; Barnes & Thornburg, 11 South Meridian Street, Indianapolis, Indiana 46204 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, 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, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report (Art. 21(3))*

[Continued on next page]

(54) Title: GAS TURBINE ENGINE FLOW PATH GEOMETRY

(57) Abstract: A flow path surface of a gas turbine engine at the location of a bladed component is disclosed in which the flow path surface includes a cylindrical upstream side and a conical downstream side. The bladed component is located at the intersection of the cylindrical upstream side and the conical downstream side. The cylindrical upstream side can extend from a leading edge of the bladed component, or a point upstream of it, to a location between the leading edge and trailing edge of the component. The conical downstream side can extend past the trailing edge of the bladed component. The bladed component can be a fan blade or a compressor blade.

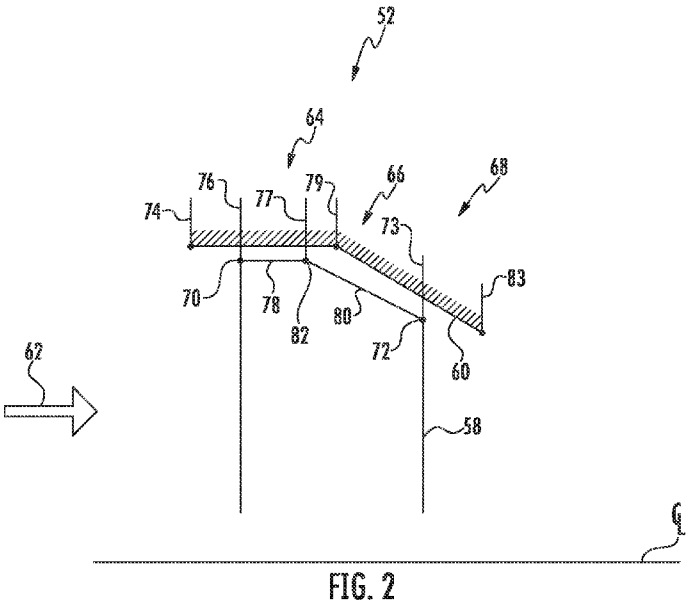

FIG. 2

WO 2014/163673 A3

— *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))*

(88) Date of publication of the international search report:
27 November 2014

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/072315

A. CLASSIFICATION OF SUBJECT MATTER
INV. F01D5/14
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)
F01D

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)
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 2011/157927 A1 (SNECMA [FR]; PERROT VINCENT PAUL GABRIEL [FR]; PESTEIL AGNES [FR]; BAE) 22 December 2011 (2011-12-22) figures 3,6 page 8, lines 23-28 page 8, line 32 - page 9, line 2	1,4-20
X	GB 2 407 344 A (ROLLS ROYCE PLC [GB]) 27 April 2005 (2005-04-27) figures 1,2,6 page 8, lines 32-34	1-20
A	GB 2 431 697 A (GEN ELECTRIC [US]) 2 May 2007 (2007-05-02) the whole document	1-20
A	EP 1 245 791 A2 (ROLLS ROYCE PLC [GB]) 2 October 2002 (2002-10-02) the whole document	1-20

☐ 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 application or patent 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	Date of mailing of the international search report
30 September 2014	09/10/2014

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

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2013/072315

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2011157927 A1	22-12-2011	CA 2801221 A1	22-12-2011
		CN 102947598 A	27-02-2013
		EP 2582985 A1	24-04-2013
		FR 2961564 A1	23-12-2011
		JP 2013529740 A	22-07-2013
		RU 2013102076 A	27-07-2014
		US 2013156559 A1	20-06-2013
		WO 2011157927 A1	22-12-2011
GB 2407344 A	27-04-2005	GB 2407344 A	27-04-2005
		GB 2418957 A	12-04-2006
		US 2009324390 A1	31-12-2009
GB 2431697 A	02-05-2007	FR 2889861 A1	23-02-2007
		GB 2431697 A	02-05-2007
		US 2007243068 A1	18-10-2007
EP 1245791 A2	02-10-2002	EP 1245791 A2	02-10-2002
		US 2002164244 A1	07-11-2002