

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 October 2008 (23.10.2008)

PCT

(10) International Publication Number
WO 2008/127437 A3

- (51) International Patent Classification:
F23R 3/06 (2006.01) F23R 3/50 (2006.01)
- (21) International Application Number:
PCT/US2007/085618
- (22) International Filing Date:
27 November 2007 (27.11.2007)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
11/606,567 30 November 2006 (30.11.2006) US
- (71) Applicant (for all designated States except US): **HONEYWELL INTERNATIONAL INC.** [US/US]; Law Department AB/2B, 101 Columbia Road, Morristown, NJ 07962 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **ZUPANC, Frank J.** [US/US]; 14409 S. 40th Place, Phoenix, Arizona 85044 (US). **SCHUMACHER, Jergen C.** [CA/US]; 4756 E. Lavender Lane, Phoenix, Arizona 85044 (US). **DUDEBOUT, Rodolphe** [CA/US]; 16026 S. 31st Street, Phoenix, Arizona 85048 (US).
- (74) Agent: **BEATUS, Carrie**; Honeywell International Inc., Law Department AB/2B, 101 Columbia Road, Morristown, New Jersey 07962 (US).

- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, 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, SV, SY, 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, 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, MT, 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

[Continued on next page]

(54) Title: QUENCH JET ARRANGEMENT FOR ANNULAR RICH-QUENCH-LEAN GAS TURBINE COMBUSTORS

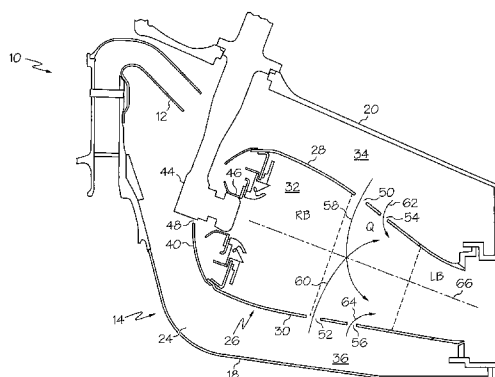


FIG. 1

(57) Abstract: A combustor (26) includes an outer liner (28) having a first row (50) and a second row of circumferentially distributed air admission holes penetrating therethrough. The combustor (26) further includes an inner liner (30) circumscribed by the outer liner (28) and having a first row (52) and a second row (56) of circumferentially distributed air admission holes penetrating therethrough. The combustor (26) further includes a plurality of fuel injectors (44) extending into the combustion chamber (32) and configured to deliver an air-fuel mixture to the combustion chamber (32). Each of the plurality of fuel injectors (44) are associated with two air admission holes in the first row (50) of the outer liner (28), two air admission holes in the first row (52) of the inner liner (30), four air admission holes in the second row (54) of the outer liner (28), and two air admission holes of the second row of the inner liner (30).

WO 2008/127437 A3



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

11 June 2009

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/085618A. CLASSIFICATION OF SUBJECT MATTER
INV. F23R3/06 F23R3/50

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)
F23R

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6 070 412 A (ANSART DENIS ROGER HENRI [FR] ET AL) 6 June 2000 (2000-06-06) the whole document	1-4
Y	US 5 934 067 A (ANSART DENIS ROGER HENRI [FR] ET AL) 10 August 1999 (1999-08-10) the whole document	1-4
A	EP 1 235 032 A (UNITED TECHNOLOGIES CORP [US]) 28 August 2002 (2002-08-28) paragraphs [0001], [0002], [0004] - [0007], [0010] - [0013], [0017], [0025] - [0028], [0031] - [0033], [0043] claims 1-3,5,6,12-14; figures 1-3,5,6	1-5,8

 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

21 April 2009

Date of mailing of the international search report

04/05/2009

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

Vogl, Paul

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/085618

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6070412	A	06-06-2000	DE 69820967 D1	12-02-2004
			DE 69820967 T2	09-12-2004
			EP 0913645 A1	06-05-1999
			ES 2210689 T3	01-07-2004
			FR 2770283 A1	30-04-1999
			JP 3714806 B2	09-11-2005
			JP 11201453 A	30-07-1999
			RU 2151343 C1	20-06-2000
US 5934067	A	10-08-1999	DE 69723348 D1	14-08-2003
			DE 69723348 T2	09-06-2004
			EP 0803681 A1	29-10-1997
			FR 2748088 A1	31-10-1997
EP 1235032	A	28-08-2002	DE 60216168 T2	11-10-2007
			JP 4129362 B2	06-08-2008
			JP 2002267161 A	18-09-2002
			US 2004006995 A1	15-01-2004
			US 2002116929 A1	29-08-2002