



(51) International Patent Classification:

F23R 3/28 (2006.01) F02M 63/00 (2006.01)
F02C 9/26 (2006.01) B05B 1/02 (2006.01)

(21) International Application Number:

PCT/US2013/065453

(22) International Filing Date:

17 October 2013 (17.10.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/715,020 17 October 2012 (17.10.2012) US

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(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))
- 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:

16 October 2014

(54) Title: FUEL NOZZLE FOR A GAS TURBINE ENGINE

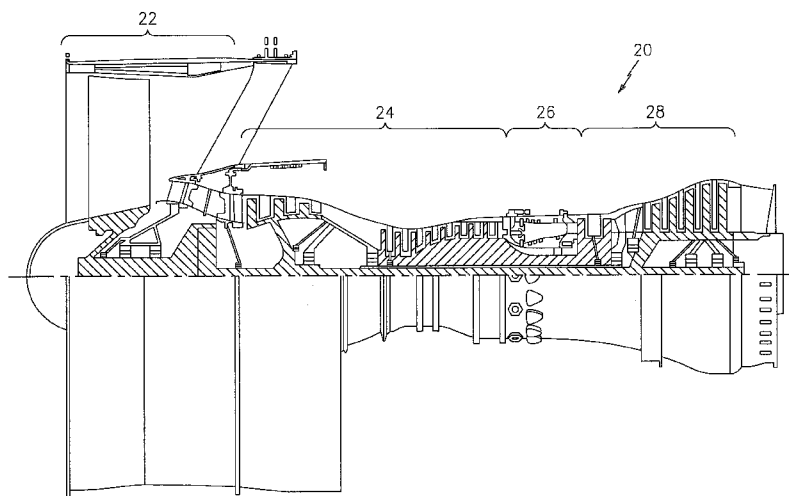


FIG. 1

(57) Abstract: A fuel nozzle for a combustor of a gas turbine engine, includes a swirler tip along an axis; and a helical adapter along the axis and within the swirler tip. A method of directing a fuel gas and a liquid through a fuel nozzle and into a combustor of a gas turbine engine includes directing a primary fuel flow through a helical insert; and directing a secondary fuel flow around the helical insert.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/065453**A. CLASSIFICATION OF SUBJECT MATTER****F23R 3/28(2006.01)i, F02C 9/26(2006.01)i, F02M 63/00(2006.01)i, B05B 1/02(2006.01)i**

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 3/28; F23R 3/14; F02C 7/22; F02G 3/00; F23R 3/30; F02C 1/00; F02C 3/30; F02C 9/26; F02M 63/00; B05B 1/02

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & keywords: fuel nozzle, gas turbine engine, swirler tip, helical adapter, and primary passage

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,715,292 B1 (HOKE, JAMES B.) 06 April 2004 See abstract; column 7, lines 19-65, column 8, lines 49-63; and figure 5.	1-9, 12-15
A		10-11
A	US 7,926,282 B2 (CHEW et al.) 19 April 2011 See abstract; column 5, lines 19-41; and figure 2.	1-15
A	US 6,021,635 A (GAAG et al.) 08 February 2000 See abstract; column 5, lines 50-67, column 7, lines 58-67; and figures 2, 3.	1-15
A	US 2012-0186259 A1 (HOKE, JAMES B.) 26 July 2012 See abstract; paragraphs [0018]-[0019]; and figure 3.	1-15
A	US 2007-0074517 A1 (CHIPMAN ROGERS et al.) 05 April 2007 See abstract; paragraph [0015]; and figure 2A.	1-15

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

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Date of the actual completion of the international search

12 August 2014 (12.08.2014)

Date of mailing of the international search report

13 August 2014 (13.08.2014)

Name and mailing address of the ISA/KR

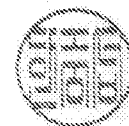
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2013/065453

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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