

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
26 May 2006 (26.05.2006)

PCT

(10) International Publication Number
WO 2006/055326 A1

(51) International Patent Classification:

C01B 3/00 (2006.01) **C01B 17/16** (2006.01)
C01B 3/32 (2006.01)

(21) International Application Number:

PCT/US2005/040336

(22) International Filing Date:

7 November 2005 (07.11.2005)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10/990,485 18 November 2004 (18.11.2004) US
11/151,223 14 June 2005 (14.06.2005) US

(71) Applicant (for all designated States except US): **PRAX-AIR TECHNOLOGY, INC.** [US/US]; 39 Old Ridgebury Road, Danbury, CT 06810-5113 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DRNEVICH, Raymond, Francis** [US/US]; 5850 Creekview Drive, Clarence Center, NY 14032 (US). **PAPAVASSILIOU, Vasilis** [US/US]; 168 Crown Royal, Williamsville, NY 14221 (US).

(74) Agents: **ROSENBLUM, David, M.** et al.; Praxair, Inc., 39 Old Ridgebury Road, Danbury, CT 06810-5113 (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.

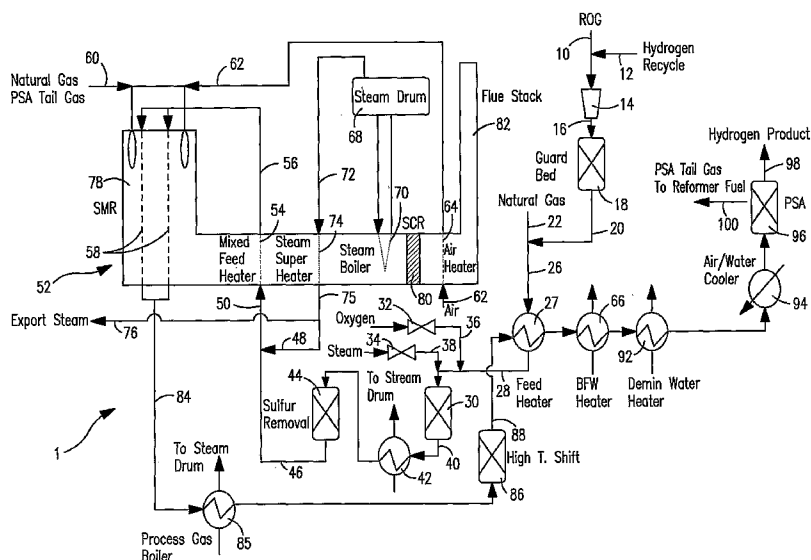
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, 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).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

[Continued on next page]

(54) Title: STEAM METHANE REFORMING METHOD



(57) Abstract: A steam methane reforming method in which a feed stream (10) is treated in a reactor (30; 30') containing a catalyst that is capable of promoting both hydrogenation and partial oxidation reactions. The feed stream (10) may be a refinery off-gas. The reactor (30; 30') is either operated in a catalytic hydrogenation mode to convert olefins into saturated hydrocarbons and/or to chemically reduce sulfur species to hydrogen sulfide or a catalytic oxidative mode utilizing oxygen and steam to prereform the feed and thus, increase the hydrogen content of a synthesis gas produced by a steam methane reformer (52). The reactor (30; 32) may be operated in alternate modes to provide for increased hydrogen production during the catalytic oxidative mode of operation or exclusively in a single mode of operation involving either a catalytic hydrogenation mode or a catalytic oxidative mode.



Published:

— with 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.