

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
14 August 2003 (14.08.2003)

PCT

(10) International Publication Number
WO 03/066517 A1

(51) International Patent Classification⁷: **C01B 3/24**,
C10G 9/04, C07C 27/00, B01J 35/02, 8/08, 8/00

(21) International Application Number: PCT/US03/03489

(22) International Filing Date: 4 February 2003 (04.02.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/355,405 5 February 2002 (05.02.2002) US

(71) Applicant (for all designated States except US): **THE REGENTS OF THE UNIVERSITY OF CALIFORNIA** [US/US]; 1111 Franklin Street, 5th floor, Oakland, CA 94607-5200 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **NORBECK, Joseph, N.** [US/US]; 600 West Central #240, Riverside, CA 92507 (US). **HACKETT, Colin, E.** [US/US]; 8414 Daisy Lane, Riverside, CA 92508 (US). **HEUMANN, James, Edward** [US/US]; 222 Old Newport Blvd., Newport Beach, CA 92663 (US). **NGO, Uy, Quoc** [US/US]; 380 N. Mollison Ave., #135, El Cajon, CA 92021 (US). **TRAN, Nguven, The** [US/US]; 7862 14th Street, Apt. A, Westminster, CA 92683 (US). **YILMAZ, Bilge** [—/US]; 8 Beacon Terrace, Apt. #2, Somerville, MA 02143-3568 (US).

(74) Agent: **CHURCHILL, Margaret, A.**; Fulbright & Jaworski L.L.P., 865 South Figueroa, Twenty-Ninth Floor, Los Angeles, CA 90017-2571 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (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

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.

(54) Title: PRODUCTION OF SYNTHETIC TRANSPORTATION FUELS FROM CARBONACEOUS MATERIALS USING SELF-SUSTAINED HYDRO-GASIFICATION

(57) Abstract: A process and apparatus for producing a synthesis gas for use as a gaseous fuel or as feed into a Fischer-Tropsch reactor to produce a liquid fuel in a substantially self-sustaining process. A slurry of particles of carbonaceous material in water, and hydrogen from an internal source, are fed into a hydro-gasification reactor under conditions whereby methane rich producer gases are generated and fed into a steam pyrolytic reformer under conditions whereby synthesis gas comprising hydrogen and carbon monoxide are generated. A portion of the hydrogen generated by the steam pyrolytic reformer is fed through a hydrogen purification filter into the hydro-gasification reactor, the hydrogen therefrom constituting the hydrogen from an internal source. The remaining synthesis gas generated by the steam pyrolytic reformer is either used as fuel for a gaseous fueled engine to produce electricity and/or process heat or is fed into a Fischer-Tropsch reactor under conditions whereby a liquid fuel is produced. Molten salt loops are used to transfer heat from the hydro-gasification reactor, and Fischer-Tropsch reactor if liquid fuel is produced, to the steam generator and the steam pyrolytic reformer.



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