



(51) International Patent Classification:

B01D 53/047 (2006.01) *F02C 3/34* (2006.01)
F02C 1/00 (2006.01) *F02C 6/18* (2006.01)

(21) International Application Number:

PCT/US2013/045607

(22) International Filing Date:

13 June 2013 (13.06.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/659,541 14 June 2012 (14.06.2012) US
61/810,339 10 April 2013 (10.04.2013) US

(71) Applicant: **EXXONMOBIL RESEARCH AND ENGINEERING COMPANY** [US/US]; 1545 Route 22 East, P.O. Box 900, Annandale, NJ 08801-0900 (US).

(72) Inventors: **SUNDARAM, Narasimhan**; 3512 King Arthur Road, Annandale, VA 22003 (US). **GUPTA, Ramesh**; 57 Lawrence Drive, Berkeley Heights, NJ 07922 (US). **THOMANN, Hans**; 26 Gatehouse Road, Bedminster, NJ 07921 (US). **CARAM, Hugo, S.**; 1236 Deerfield Drive, Allentown, PA 18104 (US). **STARCHER, Loren, K.**; 3410 Castlebrook Court, Sugar Land, TX 77478 (US). **MITTRICKER, Franklin, F.**; 14777 Presilla Drive, Jamul, CA 91935 (US). **WESTON, Simon, Christopher**; 3 Spring Brook Drive, Annandale, NJ 08801-1642 (US). **WEIGEL, Scott, J.**; 246 Elm Road, Allentown, PA 18104 (US).

(74) Agents: **MIGLIORINI, Robert, A.** et al.; Exxonmobil Research And Engineering Company, 1545 Route 22 East, P.O. Box 900, Annandale, NJ 08801-0900 (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, 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, 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))
- with amended claims (Art. 19(1))

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

10 April 2014

[Continued on next page]

(54) Title: INTEGRATION OF PRESSURE SWING ADSORPTION WITH A POWER PLANT FOR CO₂ CAPTURE/UTILIZATION AND N₂ PRODUCTION

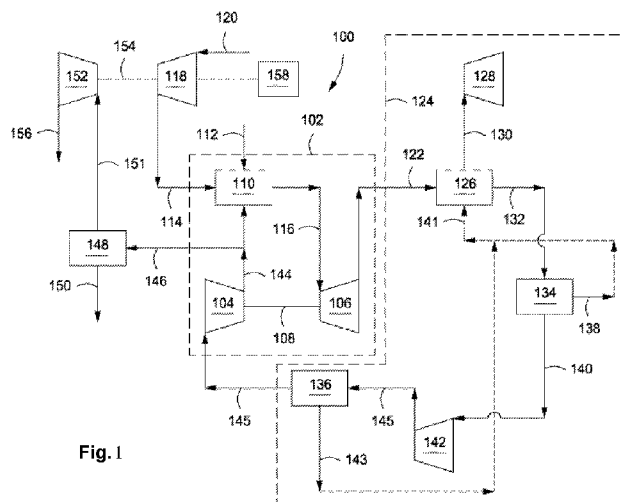


Fig. 1

(57) Abstract: Systems and methods are provided for combined cycle power generation while reducing or mitigating emissions during power generation. Recycled exhaust gas from a power generation combustion reaction can be separated using a swing adsorption process so as to generate a high purity CO₂ stream while reducing/minimizing the energy required for the separation and without having to reduce the temperature of the exhaust gas. This can allow for improved energy recovery while also generating high purity streams of carbon dioxide and nitrogen.



Date of publication of the amended claims: 31 July 2014