



(51) International Patent Classification:

G01F 23/284 (2006.01) G01F 23/296 (2006.01)
B01J 8/00 (2006.01)

(21) International Application Number:

PCT/US2014/055608

(22) International Filing Date:

15 September 2014 (15.09.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/891,569 16 October 2013 (16.10.2013) 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: HUANG, Yi En; 13925 Saddlevue Drive, North Potomac, MD 20878 (US). DANKWORTH, David, C.; 305 River Bend Road, Great Falls, VA 22066 (US). WILSON, Keith; "Robinias" Marrowells, Weybridge, Surrey KT13 9RN (GB). ALVAREZ, Manuel, S.; 6316

York Court, Warrenton, VA 20187 (US). DAVULURI, Rathna, P.; 4879 Annamohr Drive, Fairfax, VA 22030 (US). FREDERICK, Jeffrey, W.; 193 Marienstein Road, Upper Black Eddy, PA 18972 (US). PATEL, Bryan, A.; 277 Third Street, Apt. 2, Jersey City, NJ 07302 (US).

(74) Agents: GUICE, Chad 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, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, 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,

[Continued on next page]

(54) Title: REAL-TIME LEVEL MONITORING FOR FIXED BED CATALYST LOADING USING MULTIPLE LEVEL SENSORS

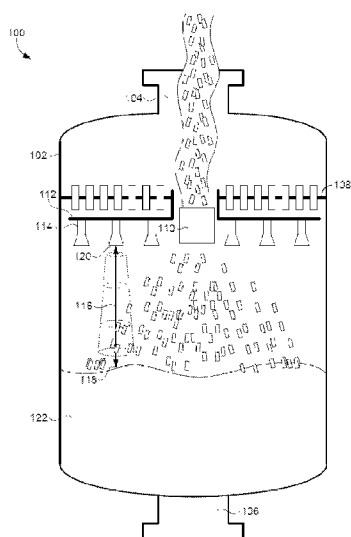


FIG. 1

(57) Abstract: In various aspects, methods and systems are provided for monitoring catalyst bed levels using multiple sensors that are temporarily installed in a reactor during catalyst loading. The multiple sensors are able to take distance measurements at substantially the same time and at predetermined time intervals so as to provide a catalyst time profile. The catalyst time profile allows an operator monitor catalyst levels during and after catalyst loading. Once catalyst loading is completed, the multiple sensors are removed from the reactor.



GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, 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))*