

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
16 February 2023 (16.02.2023)



(10) International Publication Number
WO 2023/018527 A1

(51) International Patent Classification:

C07C 5/333 (2006.01) C07C 11/06 (2006.01)
C07C 11/02 (2006.01)

(21) International Application Number:

PCT/US2022/037683

(22) International Filing Date:

20 July 2022 (20.07.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/231,939 11 August 2021 (11.08.2021) US
63/328,935 08 April 2022 (08.04.2022) US

(71) Applicant: **EXXONMOBIL CHEMICAL PATENTS INC.** [US/US]; 5200 Bayway Drive, Baytown, TX 77520 (US).

(72) Inventors: **DIAZ URRUTIA, Christian, A.**; Rue Emile Steeno 12, 1160 Auderghem (BE). **BAO, Xiaoying**; 4239 Albans, Houston, TX 77005 (US). **KUECHLER, Keith, H.**; 912 Applewood Drive, Friendswood, TX 77546 (US). **MADUSKAR, Saurabh, S.**; 3 Hermann Museum Circle Drive, Apt. 4402, Houston, TX 77004 (US). **SHARMA, Arun, K.**; 1851 Viola Lane, Hellertown, PA 18055 (US).

CLAY, Russell, T.; 10702 Radiant Realm Dr., Tomball, TX 77375 (US).

(74) Agent: **CHEN, Siwen** et al.; ExxonMobil Chemical Company, Law Department, P.O. Box 2149, Baytown, TX 77522-2149 (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, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, 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, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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, 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,

(54) Title: PROCESSES FOR DEHYDROGENATING ALKANES AND ALKYL AROMATIC HYDROCARBONS

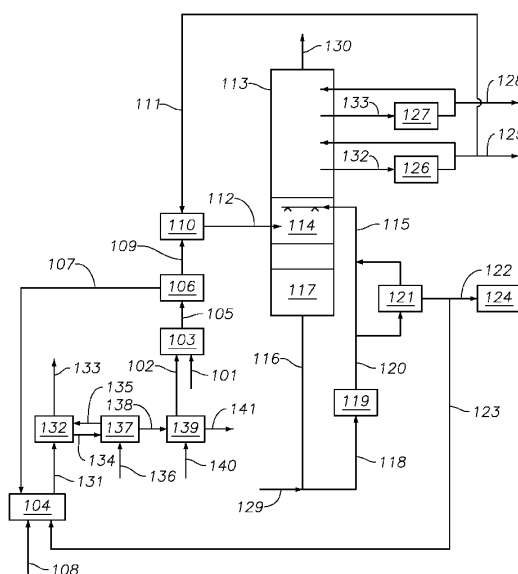


FIG. 1

(57) Abstract: A hydrocarbon can be contacted with dehydrogenation catalyst particles to produce an effluent that can include coked catalyst particles and dehydrogenated hydrocarbon(s). A first stream rich in coked catalyst particles and a second stream rich in dehydrogenated hydrocarbon(s) and containing entrained catalyst particles can be separated from the effluent. The second stream can be contacted with a first quench medium to produce a cooled stream. The cooled stream can be contacted with a second quench medium within a quench tower. A gaseous stream that includes the dehydrogenated hydrocarbon(s), a first quench medium stream, and a slurry stream that includes the second quench medium and the entrained catalyst particles can be separated from the tower. The first quench medium can be recycled. The entrained catalyst particles can be separated from the slurry to provide recovered second quench medium and recovered entrained catalyst particles. The recovered second quench medium can be recycled.

[Continued on next page]

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))*