

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
06 April 2023 (06.04.2023)



(10) International Publication Number
WO 2023/056191 A1

(51) International Patent Classification:

C10G 9/00 (2006.01) F28D 7/10 (2006.01)
F28C 3/06 (2006.01)

(21) International Application Number:

PCT/US2022/076728

(22) International Filing Date:

20 September 2022 (20.09.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/250,262 30 September 2021 (30.09.2021) US

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

(72) Inventors: **SPICER, David**; 5319 Del Monte Drive, Houston, TX 77056 (US). **SLONAKER, James, C.**; 4500 Bayway Drive, BTEC East - Rm 2185, Baytown, TX 77520 (US). **HIRST, Thomas, T.**; 16326 Heatherdale Drive, Houston, TX 77059 (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,

(54) Title: CONDUIT AND PROCESS FOR COOLING A HYDROCARBON GAS-CONTAINING STREAM

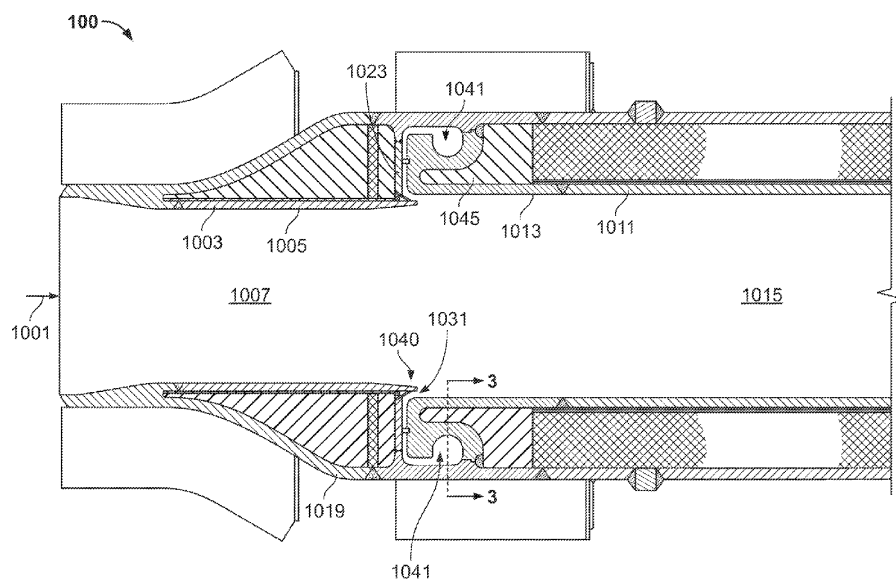


FIG. 1

(57) Abstract: Conduits for cooling a hydrocarbon stream and processes for using same. The conduit can include a first inner wall defining a first bore, a second inner wall defining a second bore, and an outer wall disposed about the first and second inner walls. The conduit can also include an annular support wall connected to an inner surface of the outer wall. An end of the second inner wall and an end of the annular support wall can define a perimeter opening that can be in fluid communication with the second bore. An annular flexible ring can be bonded to the annular support wall and can flexibly contact the first inner wall. A substantially annular cavity can be disposed between the second inner and the outer walls and in fluid communication with the perimeter opening. A quench fluid introduction port can be configured to introduce a quench fluid into the cavity.

[Continued on next page]

WO 2023/056191 A1

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, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, 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))*

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))*