



- (51) **International Patent Classification:**
B01D 53/92 (2006.01) *B01D 53/62* (2006.01)
- (21) **International Application Number:**
PCT/US2024/025726
- (22) **International Filing Date:**
22 April 2024 (22.04.2024)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
63/497,696 21 April 2023 (21.04.2023) US
- (71) **Applicant:** **CHEVRON U.S.A. INC.** [US/US]; Chevron Corporation, P.O. Box 6006, San Ramon, California 94583-0806 (US).
- (72) **Inventors:** **BHUWANIA, Nitesh**; Chevron Corporation, P.O. Box 6006, San Ramon, California 94583-0806 (US). **CHINN, Daniel**; Chevron Corporation, P.O. Box 6006, San Ramon, California 94583-0806 (US). **JADHAV, Ra-**

ja Ankush; Chevron Corporation, P.O. Box 6006, San Ramon, California 94583-0806 (US). **HUANG, Zihan**; Chevron Corporation, P.O. Box 6006, San Ramon, California 94583-0806 (US).

(74) **Agent:** **GUERRERO, Jason M.** et al.; Chevron Corporation, P.O. Box 6006, San Ramon, California 94583-0806 (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, MG, MK, MN, MU, 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.

(54) **Title:** MEMBRANE PRECONCENTRATION OF CARBON DIOXIDE FROM EXHAUST GAS SOURCES

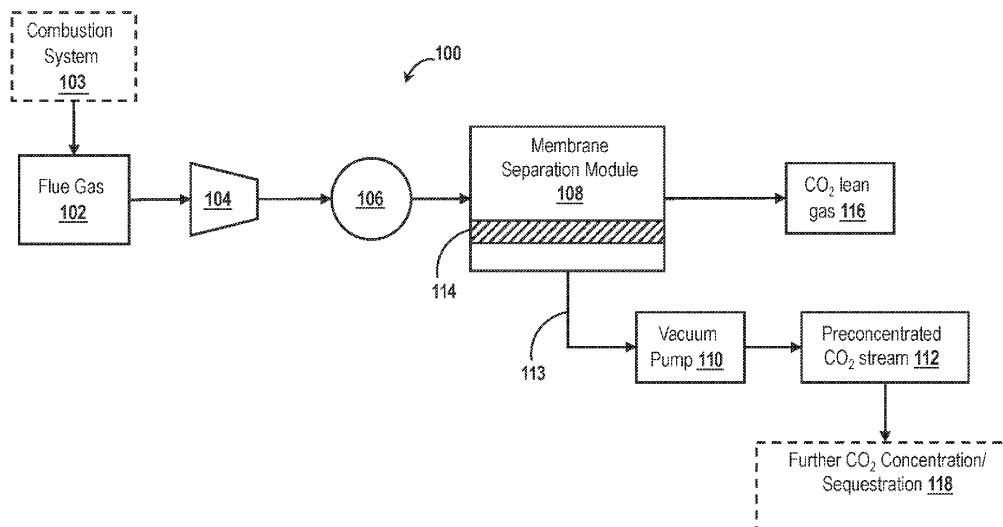


FIG. 2

(57) **Abstract:** A process of preconcentrating CO₂ in an exhaust gas stream includes flowing all the exhaust gas stream from an exhaust gas source to a CO₂ preconcentration system. Within the CO₂ preconcentration system, at least a portion of the exhaust gas stream is fed to a membrane separation module comprising a polymeric membrane that has a perm-selectivity for CO₂ over N₂ and O₂, to produce a CO₂ rich exhaust gas. The exhaust gas stream may initially have as low as 400 ppm CO₂ and may be preconcentrated to over 8 vol. % CO₂, thereby generating a more optimal feed for further treatment processes.

[Continued on next page]

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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, ME, 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 the identity of the inventor (Rule 4.17(i))*
- *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:

- *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*