

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
18 August 2022 (18.08.2022)



(10) International Publication Number
WO 2022/173454 A1

(51) International Patent Classification:

H01M 8/0254 (2016.01) H01M 8/0265 (2016.01)
H01M 8/0256 (2016.01) H01M 8/04089 (2016.01)
H01M 8/0258 (2016.01) H01M 8/14 (2006.01)

(21) International Application Number:

PCT/US2021/020838

(22) International Filing Date:

04 March 2021 (04.03.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

17/173,786 11 February 2021 (11.02.2021) US

(71) Applicants: **EXXONMOBIL RESEARCH AND ENGINEERING COMPANY** [US/US]; 1545 Route 22 East, P. O. Box 900, Annandale, New Jersey 08801-0900 (US). **FUELCELL ENERGY, INC.** [US/US]; 3 Great Pasture Road, Danbury, Connecticut 06810 (US).

(72) Inventors: **HOWARD, Christopher**; 56 Horance St., Stratford, Connecticut 06614 (US). **O'NEILL, Brandon J.**; 2323 E. Mossy Oaks Road, Apt. 252, Spring, Texas 77389 (US). **RUBAS, Paul J.**; 10 Foxwood Lane, Milford, New Jersey 08848 (US). **HERSHKOWITZ, Frank**; 509 Lyons Road, Basking Ridge, New Jersey 07920 (US). **HAN, Lu**; 37 Milestone Dr., Ringoes, New Jersey 08551 (US). **NOVACCO, Lawrence J.**; 16 Allen Road, Brookfield, Connecticut 06804 (US). **DOBEK, Jr., Frank J.**; 71 Stoneridge Rd., Colchester, Connecticut 06415 (US). **DAVID, Keith E.**; 58 Sachem Rd., Southbury, Connecticut 06488 (US). **BULLECKS, Brian**; 157 Fields Hill Rd., Sumner, Maine 04292 (US).

(74) Agent: **HOWARD, Jason O.**; Shook, Hardy & Bacon, LLP, 2555 Grand Blvd., Kansas City, Missouri 64108 (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, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, 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, 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))

(54) Title: FLOW BAFFLE FOR MOLTEN CARBONATE FUEL CELL

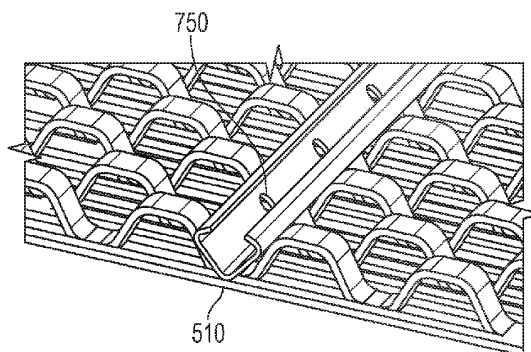


FIG. 7

(57) Abstract: Molten carbonate fuel cell configurations are provided that allow for introduction of an anode input gas flow on a side of the fuel cell that is adjacent to the entry side for the cathode input gas flow while allowing the anode and cathode to operate under co-current flow and/or counter-current flow conditions. Improved flow properties are achieved during co-current flow or counter-current flow operation by diverting the input flow for the anode or cathode into an extended edge seal region adjacent to the active area of the anode or cathode, and then using a baffle to provide sufficient pressure drop for even flow distribution across the anode or cathode. A second baffle can be used to create a pressure drop as the output flow exits from the active area into a second extended edge seal region prior to leaving the fuel cell.

WO 2022/173454 A1