

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
15 August 2019 (15.08.2019)



(10) International Publication Number
WO 2019/156627 A1

(51) International Patent Classification:

H01M 8/065 (2016.01) H01M 8/04119 (2016.01)
C01B 3/00 (2006.01) H01M 8/04082 (2016.01)
H01M 8/0662 (2016.01) H01M 8/04664 (2016.01)
H01M 8/04007 (2016.01) H01M 8/04746 (2016.01)
H01M 8/04029 (2016.01) C01B 3/06 (2006.01)
H01M 8/04089 (2016.01)

(21) International Application Number:

PCT/SG2019/050063

(22) International Filing Date:

01 February 2019 (01.02.2019)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10201801031W 06 February 2018 (06.02.2018) SG

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(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, 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, 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, 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,

(54) Title: A PORTABLE FUEL CELL APPARATUS AND SYSTEM

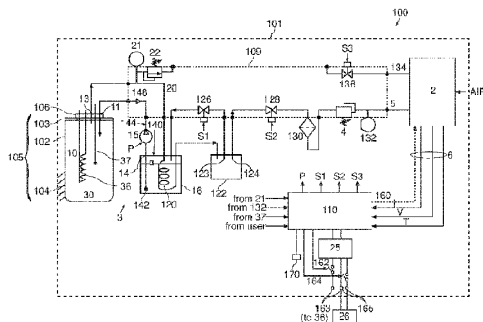


FIG. 1A

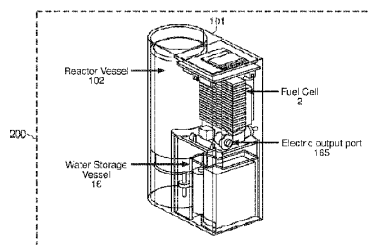


FIG. 1B

(57) Abstract: The present application describes an improved portable proton exchange membrane fuel cell (PEMFC) system (100) and apparatus (200) integrated with a hydrogen generator that produces hydrogen gas from the exothermic MgH₂ hydrolysis reaction in order to produce electrical energy needed for soldier worn electronics, gears, etc. The disclosed PEMFC apparatus and system has much higher gravimetric energy density values compared to conventional batteries due to use of fuel cells and a hydrogen-rich hydrogen storage material of MgH₂. The PEMFC system provides several safety features when the power system is portable and carried by the respective user.

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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))*
- *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*