



(51) International Patent Classification:

H01M 4/86 (2006.01) H01M 8/12 (2016.01)
H01M 8/0245 (2016.01)

(21) International Application Number:

PCT/GB2024/051349

(22) International Filing Date:

24 May 2024 (24.05.2024)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2307791.0 24 May 2023 (24.05.2023) GB

(71) Applicant: **HYPANODE LTD** [GB/GB]; 28a High Street
South, Crail, Anstruther, Fife KY10 3TE (GB).

(72) Inventors: **AGNEW, Gerald Daniel**; Ivy Cottage, Dove-
leys, Uttoxeter, Staffordshire ST14 5BY (GB). **HABER-**

MAN, Benjamin Adam; 98 Brookdale Avenue, Toronto,
Ontario M5M 1P3 (CA).

(74) Agent: **HGF LIMITED**; Document Handling (Sheffield),
1 City Walk, Leeds West Yorkshire LS11 9DX (GB).

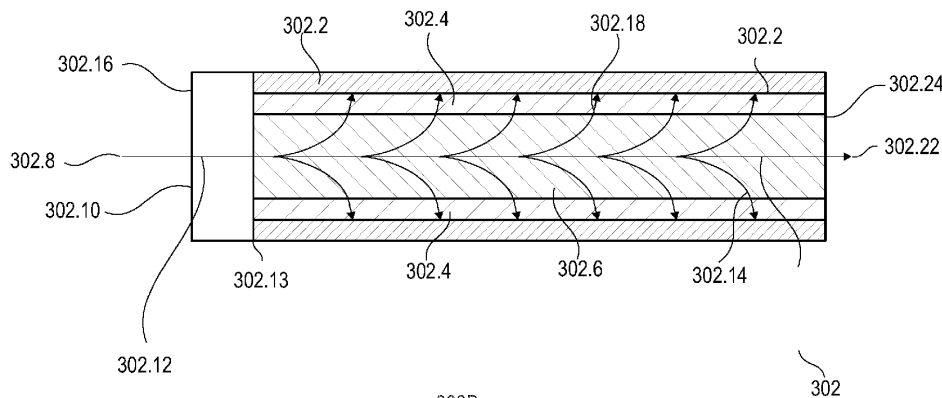
(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM,
DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IQ, 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.

(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,

(54) Title: SOLID OXIDE FUEL CELLS AND SYSTEMS

Anode cell

Fig. 3B.1



(57) Abstract: Examples relate to multi-layered structures for a fuel cell. Such a multi-layered structure comprises an electrolyte; a permeable electrode; an inert permeable barrier; the permeable electrode and electrolyte having a common interface to form a reaction region; the permeable electrode providing a permeable electrode reactant pathway through the electrode to present a reactant at the common interface; the permeable electrode reactant pathway being fed by a permeable reactant pathway, and the inert permeable barrier comprises an inert permeable barrier reactant pathway providing a convectively dominant reactant flow regime within the inert permeable barrier, wherein the convectively dominant reactant flow regime of the inert permeable barrier reactant pathway feeds the permeable reactant pathway.

[Continued on next page]

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:

— *of inventorship (Rule 4.17(iv))*

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))*