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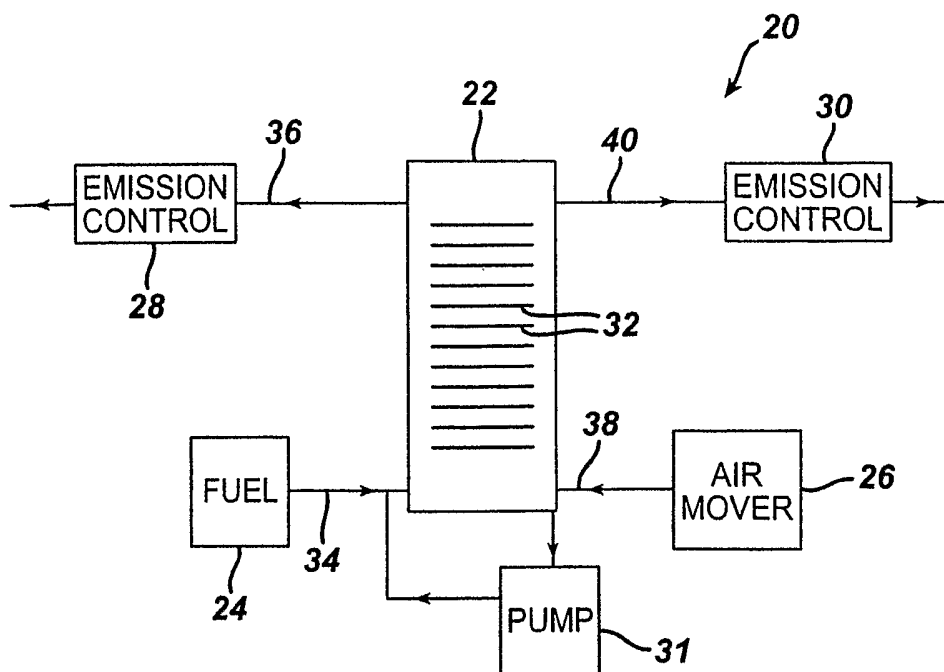
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[Continued on next page]

(54) Title: FUEL CELL SYSTEMS



(57) Abstract: Fuel cell systems and methods of operating fuel cell systems (20) are disclosed. In some embodiments, the systems and methods include an emission control system (28, 30) that reduces an amount of organic emission(s) released from the fuel cell systems. The organic emission(s) can include, for example, methanol, formic acid, and/or formaldehyde.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H01M8/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No. .
X	PATENT ABSTRACTS OF JAPAN vol. 2002, no. 03, 3 April 2002 (2002-04-03) & JP 2001 313059 A (TOYOTA MOTOR CORP), 9 November 2001 (2001-11-09)	1-4,7,9, 16,17
Y	abstract	6,8,18, 19
Y	----- US 2003/007912 A1 (SILVER RONALD G) 9 January 2003 (2003-01-09) paragraphs [0011] - [0015], [0019], [0020], [0035], [0036] ----- -/--	6,8

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 10, 31 October 1996 (1996-10-31) & JP 08 148151 A (TOKYO GAS CO LTD), 7 June 1996 (1996-06-07) abstract	18,19
X	----- DE 101 07 529 A1 (FORSCHUNGSZENTRUM JUELICH GMBH) 5 September 2002 (2002-09-05) paragraphs [0005] - [0017], [0029], [0030]; figures 2,3	1-4,9, 16,17
X	----- US 5 573 866 A (VAN DINE ET AL) 12 November 1996 (1996-11-12) column 2, line 47 - column 2, line 58 column 3, line 23 - column 4, line 11 claims 1-3,8; figure 1	1-4,7,9, 10,15-17
X	----- PATENT ABSTRACTS OF JAPAN vol. 005, no. 171 (E-080), 30 October 1981 (1981-10-30) & JP 56 097972 A (HITACHI LTD), 7 August 1981 (1981-08-07) abstract	1-3,7,9, 16,17
X	----- WO 02/15306 A (SIEMENS AKTIENGESELLSCHAFT; PREIDEL, WALTER) 21 February 2002 (2002-02-21) page 1, line 28 - page 2, line 37 page 3, line 26 - page 4, line 29 page 5, line 16 - page 6, line 20 claims 1-3; figures 1-3	1-3,7,9, 10,16,17
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P,X	----- WO 03/047010 A (FORSCHUNGSZENTRUM JUELICH GMBH; DOHLE, HENDRIK; MERGEL, JUERGEN) 5 June 2003 (2003-06-05) page 2, line 1 - page 2, line 12 page 2, line 29 - page 5, line 22 claims 1,2,4-8	1-4,7-9, 16,17
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/014673

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-20

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-20

Claims 1-20 are directed to a fuel cell system, comprising an outlet; a fuel cell stack in fluid communication with the outlet; an organic fuel in fluid communication with the fuel cell stack; and an emission control system in fluid communication with the outlet, the control system capable of reducing an amount of an organic emission from the outlet.

2. claims: 21-28, 35-50

Claims 21-28 and 35-50 are directed to a fuel cell system, comprising a fuel cell including a gas diffusion layer having dispersed therein a first material capable of reducing an amount of an organic emission that contacts the first material (claims 21-28), or to the method of operating such a fuel cell system (claims 35-50).

3. claims: 29-34, 51-56

Claims 29-34 and 51-56 directed to a fuel cell system, comprising a fuel cell stack including a cathode catalyst and a passageway in fluid communication with the cathode catalyst; and a mechanism adapted to restrict gas flow through passageway (claims 29-34), or to the method of operating such a fuel cell system (claims 51-56).

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/014673

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