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[Continued on next page]

(54) Title: MANIFOLD ASSEMBLY FOR CONTROLLING GAS FLOW AND FLOW DISTRIBUTION IN A FUEL CELL STACK

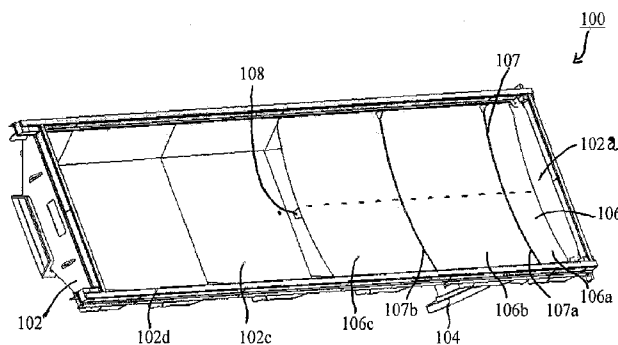


FIG. 1

(57) Abstract: A manifold assembly for use with a fuel cell stack for the purpose of ensuring a desired flow distribution to fuel cells within the stack, with the most commonly desired being uniform flow distribution. Said manifold assembly comprising: an external manifold for abutting and sealingly enclosing a face of the fuel cell stack, wherein the manifold comprises an enclosure for one of: providing inlet gas to the fuel cell stack and receiving exhaust gas from said fuel cell stack; and one or more baffles disposed in the enclosure of the external manifold, the one or more baffles one of: (a) controlling gas flow distribution and direction of the inlet gas from the enclosure to fuel cells of the fuel cell stack to achieve a predetermined distribution or a uniform distribution; and (b) controlling gas flow distribution of the exhaust gas flow within the enclosure to achieve the predetermined distribution or the uniform distribution of gas to fuel cells of the fuel cell stack. A multi-stack fuel cell system including a baffling assembly with one or more baffles for providing a predetermined gas flow distribution to each fuel cell stack in the fuel cell system is also described. The baffling assembly is provided at a system level and comprises one or more baffles in an intake assembly and/or in an exhaust assembly of the multi-stack fuel cell system, so that each fuel cell stack receives a predetermined amount of gas.





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, ML, MR, NE, SN, TD, TG).

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PCT/US2012/022322**A. CLASSIFICATION OF SUBJECT MATTER****H01M 8/24(2006.01)i, H01M 8/04(2006.01)i, H01M 8/02(2006.01)i**

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)

H01M 8/24; H01M 8/04; H01M 8/02

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: external, manifold, fuel cell, baffle, distribution

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 8004012 B2 (HITACHI, LTD.) 17 January 1996	1-32
Y	See abstract, pages 2-3, claims 1-3, figures 1-4.	33-39
Y	WO 2009-149314 A2 (FUELCELL ENERGY, INC.) 10 December 2009 See abstract, pages 1-39, figures 2-4, 7.	33-39
X	JP 08-306381 A (FUJI ELECTRIC CO., LTD.) 22 November 1996 See abstract, paragraphs [0016]-[0021], claims 1-3, figures 1-2, 5.	1-2, 10, 13-14, 22 , 25-26, 30, 32
X	JP 6038344 B2 (TOSHIBA CORPORATION) 18 May 1994 See abstract, pages 2-4, claim 1, figures 1-3, 5.	1, 13, 25, 32
X	US 2002-0076601 A1 (GUTHRIE, ROBIN J. et al.) 20 June 2002 See abstract, paragraphs [0030]-[0039], claims 1-11, figures 3-6.	1, 10, 13, 22, 25, 30 , 33-36

 Further documents are listed in the continuation of Box C. See patent family annex.

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 8004012 B2	17.01.1996	None	
WO 2009-149314 A2	10.12.2009	EP 2297811 A2 KR 10-2011-0014715 A US 2011-0081592 A1 WO 2009-149314 A3	23.03.2011 11.02.2011 07.04.2011 11.03.2010
JP 08-306381 A	22.11.1996	None	
JP 6038344 B2	18.05.1994	None	
US 2002-0076601 A1	20.06.2002	US 6632556 B2	14.10.2003