

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
11 December 2003 (11.12.2003)

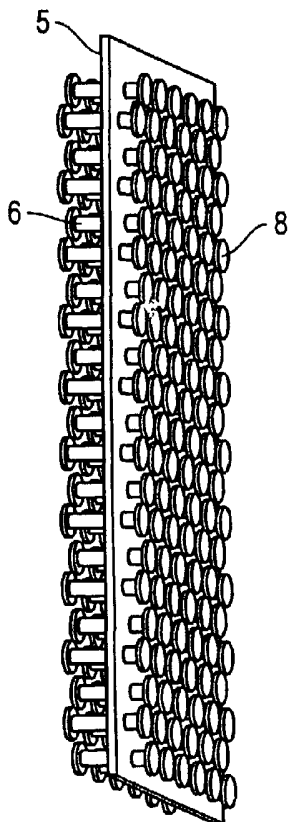
PCT

(10) International Publication Number  
WO 2003/103082 A3

- (51) International Patent Classification<sup>7</sup>: H01M 8/02
- (21) International Application Number:  
PCT/US2003/016949
- (22) International Filing Date: 30 May 2003 (30.05.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/384,659 31 May 2002 (31.05.2002) US
- (71) Applicant: LYNNTTECH, INC. [US/US]; 7610 Eastmark Drive, College Station, TX 77845 (US).
- (72) Inventors: ANDREWS, Craig; 1106 Walton Drive, College Station, TX 77840 (US). CISAR, Alan, J.; 15603 Juniper Hollow Way, Cypress, TX 77433 (US). GREENWALD, Charles; 707 Broadmoor, Bryan, TX 77802 (US).
- (74) Agent: STREETS, Jeffrey, L.; Streets & Steele, Suite 355, 13831 Northwest Freeway, Houston, TX 77040 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

[Continued on next page]

(54) Title: ELECTROCHEMICAL CELL AND BIPOLAR ASSEMBLY FOR AN ELECTROCHEMICAL CELL



(57) Abstract: A bipolar assembly for use in electrochemical cell stacks, especially stacks operated at low pressure. The bipolar assembly is lightweight and provides a "post-type" flow field that operates with a low pressure drop. The bipolar assembly comprises a gas barrier having an array of electronically conducting posts disposed approximately perpendicular to the gas barrier. Each end of the posts is in electrical communication with the surface of an electrode. Because the bipolar assembly separates a cathode from an anode, the posts contact an anode electrode on one end and a cathode electrode on the other end. The posts provide current conduction through the stack as well as provide the flow fields for the electrochemical reactants. Optionally, the bipolar assembly may contain cooling fluid channels formed by adding additional gas barriers to the bipolar assembly. The space between the gas barriers form a channel through which cooling fluids may be circulated.

WO 2003/103082 A3



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**(88) Date of publication of the international search report:**  
13 January 2005

**Published:**

- *with international search report*
- *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.*

## INTERNATIONAL SEARCH REPORT

Int	Application No
	PCT/US 03/16949

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 H01M8/02		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> 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		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/045086 A1 (OHTANI TERUYUJI ET AL) 18 April 2002 (2002-04-18)  paragraphs '0008! - '0037! figures 2,3	1-3, 9, 21-23, 79, 81, 82
X	PATENT ABSTRACTS OF JAPAN vol. 017, no. 398 (E-1403), 26 July 1993 (1993-07-26) -& JP 05 074469 A (YAMAHA MOTOR CO LTD), 26 March 1993 (1993-03-26) abstract  ----- -/--	1-3, 10, 11, 21, 22, 29, 79, 81, 82
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> 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 *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *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 *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family
Date of the actual completion of the international search  5 November 2004		Date of mailing of the international search report  19/11/2004
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer  GONZALEZ-CUENCA, M

INTERNATIONAL SEARCH REPORT

Inte                      ublication No  
 PC1/US                US/16949

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/065000 A1 (MOROZUMI EIICHIRO) 30 May 2002 (2002-05-30)  paragraphs '0009! - '0046! figures 1a,1b  -----	1-3,9, 10,21, 22,29, 79,81,82
A	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 08, 6 October 2000 (2000-10-06) & JP 2000 133282 A (ISHIKAWAJIMA HARIMA HEAVY IND CO LTD), 12 May 2000 (2000-05-12) abstract  -----	1-85

INTERNATIONAL SEARCH REPORT

Intern application No  
PCT/US J3/16949

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002045086 A1	18-04-2002	JP 3534685 B2 JP 2002042828 A	07-06-2004 08-02-2002
JP 05074469 A	26-03-1993	NONE	
US 2002065000 A1	30-05-2002	JP 2002164062 A EP 1211742 A2	07-06-2002 05-06-2002
JP 2000133282 A	12-05-2000	NONE	