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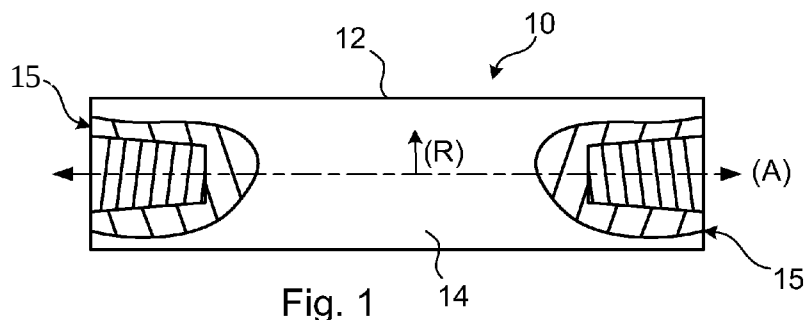
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(54) Title: GRAPHITE ELECTRODE



(57) Abstract: A graphite electrode exhibits oxidation resistance by modifying the outer radial surface characteristics. The outer radial surface may be modified by providing a textured portion which improves water flow while minimizing water absorption. Alternatively, a layer of flexible graphite or plurality of particles of exfoliated graphite may be disposed on the outer radial surface of the electrode body.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 11/42407

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - C01 B 31/04 (2013.01)

USPC - 428/402

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)

USPC - 428/402

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC - all classes; ; 106/286.8; 241/15, NPL (Keyword delimited)

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

PatBase, Patbase (classified), Google Patents, Google Scholar

Search terms used: Graphite, electrode, darcy, gas permeability, textured, etch#, polish#, machined, sand#, cylind# . tube, radial#, contact angle, mat, foil, cover#, sheet, carbon nanotube, droplet, surface, body, antioxidant, volume, 50 percent

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3,993,503 A (LUDWIG) 23 November 1976 (23.11.1976), col 9, ln 50-col 10, ln 52; Fig 1-3	4, 5, 10
Y		6-9, 11, 14, 15
X	US 2006/0193364 A1 (SHIRAIISHI et al.) 31 August 2006 (31.08.2006), para [0015], [0016]; Fig 1, 2	1-3, 12, 13
Y	US 4,824,733 A (DALLAIRE) 25 April 1989 (25.04.1989), col 3, ln 55-60	6, 7
Y	US 4,567,103 A (SARA) 28 January 1986 (28.01.1986), col 1, ln 18-22; col 2, ln 63-col 3, ln 2	8, 9, 14, 15
Y	US 6,864,007 B1 (IQBAL et al.) 08 March 2005 (08.03.2005), col 6, ln 26-41; claim 3	11
A	US 4,461,689 A (DIEPERS) 24 July 1984 (24.07.1984), col 2, ln 20-26; col 3, ln 42-50; col 6, ln 40-43	1-15
A	US 2005/0254545 A1 (DAIMER) 17 November 2005 (17.11.2005), abstract; para [0043], [0060]	1-15
A	US 2010/0136289 A1 (EXTRAND et al.) 03 June 2010 (03.06.2010), para [0010], [0025], [0032], [0034], [0041], [0081] and figure 1C	1-15
A	US 5,985,452 A (MERCURI) 16 November 1999 (16.11.1999), abstract	1-15
A	US 2005/0012894 A1 (KETELSON et al.) 20 January 2005 (20.01.2005), para [0028]	1-15
A	US 2006/0278287 A1 (FIELDEN et al.) 14 December 2006 (14.12.2006), para [0023], [0033]	1-15

☒ Further documents are listed in the continuation of Box C.
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* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered to be novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"G" document member of the same patent family
"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	

Date of the actual completion of the international search 03 April 2013 (03.04.2013)	Date of mailing of the international search report 29 APR 2013
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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.
A	US 6,706,400 B2 (MERCURI et al.) 16 March 2004 (16.03.2004), para [0004], [0058]; claim 1	1-15
A	US 2002/0167109 A1 (KLUG) 14 November 2002 (14.11.2002), para [0054]	1-15
A	US 5,618,325 A (BANIEL) 08 April 2007 (08.04.2007), col 3, ln 32-36	1-15
A	US 4,740,990 A (RADEV et al.) 26 April 1988 (26.04.1988), entire document	1-15
A	US 4,578,249 A (SRINIVASAN et al.) 25 March 1986 (25.03.1986), entire document	1-15
A	US 4,084,041 A (LUDWIG) 11 April 1978 (11.04.1978), entire document	1-15