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[Continued on next page]

(54) Title: ELECTROCHEMICAL MACHINING METHOD AND APPARATUS

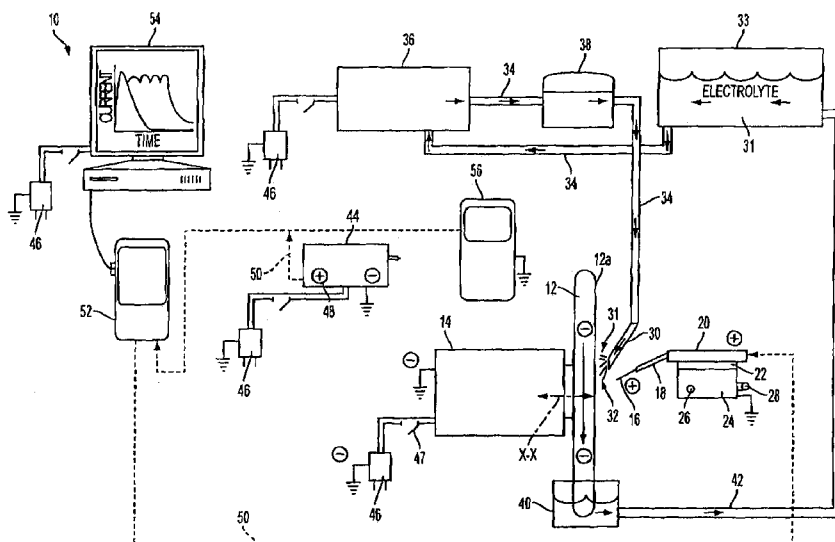


FIG. 1

(57) Abstract: Electrochemical machining method and apparatus wherein in one aspect of the invention, the machining voltage is selected to maintain the highest current without initiating substantial hydrolysis of the electrolyte flushed between the work piece anode and tool cathode. In another aspect of the invention, the Low Machining Potential Voltage (LMPV) and High Machining Potential Voltage (HMPV) for a particular work piece material are identified and the work piece is machined using a voltage at or between the LMPV and HMPV. In yet another aspect of the invention, direct perturbation of the Beta Insulating Layer (BIL) is carried out in an optimally small (between about near zero to about 10µ) inter-electrode gap (IEG) with constant and simultaneous pulling in and pushing out of the electrolyte through the IEG.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/039992**A. CLASSIFICATION OF SUBJECT MATTER*****B23H 3/00(2006.01)i, B23H 3/02(2006.01)1, B23H 3/04(2006.01)1, B23H 3/10(2006.01)1***

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)

B23H 3/00; B23H 3/02; B23H 3/04; B23H 9/10; B23H 11/00; B23H 9/14; HOIC 17/06; B23H 3/10

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: ECM, electrochemical, electrolyte, perturbing and flushing.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4053977 A (PAUL RENE SIMON et al.) 18 October 1977 See	1-24
A	JP 2001-341030 A (SANEI KI KO KK et al.) 11 December 2001 See the abstract, column 6, line 40 - column 7, line 30, figs. 6-8.	1-24
A	JP 2008-119807 A (DENSO CORP.) 29 May 2008 See the abstract, paragraphs [0015,0018], figs. 1,2,5.	1-24
A	KR 10-2009-0070019 A (KOREA PLANT SERVICE & ENGINEERING CO., LTD.) 01 July 2009 See the abstract, fig.1.	1-24
A	US 6176998 B1 (FRANK PETER WARDLE et al.) 23 January 2001 See the abstract, fig.1.	1-24
A	US 5879533 A (FRANK PETER WARDLE) 09 March 1999 See the abstract, column 2, lines 33- 53, fig.1.	1-24
A	JP 2009-255243 A (HODEN SEIMITSU KAKO KENKYUSHO LTD.) 05 November 2009 See the abstract, fig.1.	1-24

 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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