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(71) Applicant *(for all designated States except US)*: BATTELLE MEMORIAL INSTITUTE [US/US]; 902 Battelle Boulevard, Richland, WA 99352 (US).

(71)(72) Applicants and Inventors: TITUS, Charles, H. [US/US]; 323 Echo Valley Lane, Newtown Square, PA 19073 (US). COHN, Daniel, R. [US/US]; 26 Walnut Hill Road, Chestnut Hill, MA 02167 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: SURMA, Jeffrey, E. [US/US]; 806 Brian Lane, Kennewick, WA 99337 (US).

(74) Agent: JIMENEZ, Mary, Raynor; Choate, Hall & Stewart, 53 State Street, Exchange Place, Boston, MA 02109 (US).

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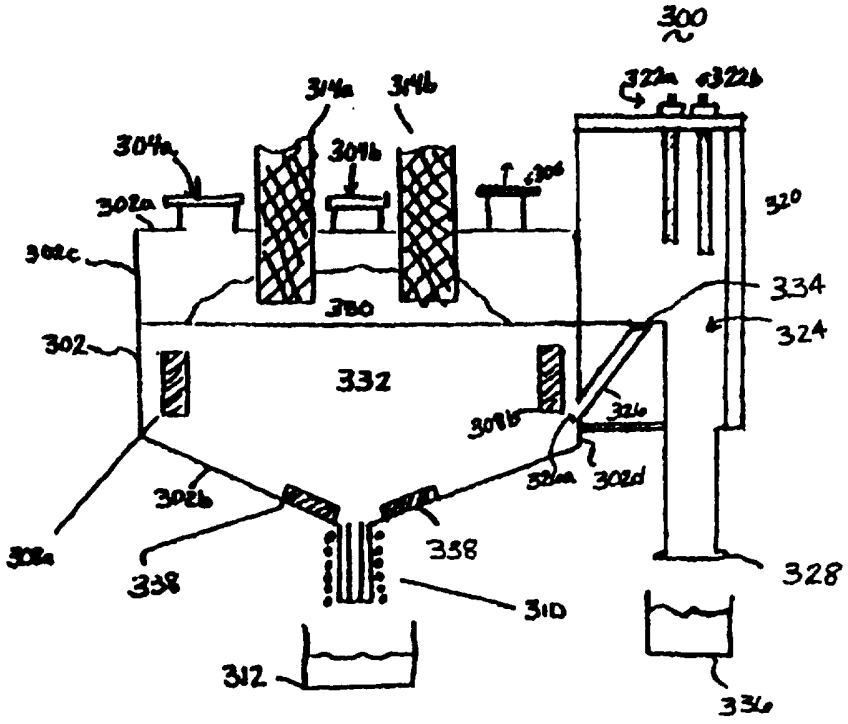
(54) Title: TUNABLE, SELF-POWERED INTEGRATED ARC PLASMA-MELTER VITRIFICATION SYSTEM FOR WASTE TREATMENT AND RESOURCE RECOVERY

(57) Abstract

The present invention provides a relatively compact self-powered, tunable waste conversion system and apparatus which has the advantage of highly robust operation which provides complete or substantially complete conversion of a wide range of waste streams into useful gas and a stable, nonleachable solid product at a single location with greatly reduced air pollution to meet air quality standards. The system provides the capability for highly efficient conversion of waste into high quality combustible gas and for high efficiency conversion of the gas into electricity by utilizing a high efficiency gas turbine or by an internal combustion engine. The solid product can be suitable for various commercial applications. Alternatively, the solid product stream, which is a safe, stable material, may be dipsosed of without special considerations as hazardous material. In the preferred embodiment of the invention, the arc plasma furnace and joule heated melter are formed as a fully integrated unit with a common melt pool having circuit arrangements for the simultaneous independently controllable operation of boththe arc plasma and the joule heated portions of the unit without interference with one another. The preferred configuration of this embodiment of the invention utilizes two arc plasma electrodes with an elongated chamber for the molten pool such that the molten pool is capable of providing conducting paths between electrodes. The apparatus may additionally be employed with reduced or without further use of the gases generated by the conversion process. The apparatus may be employed as a self-powered or net electricity producing unit where use of an auxiliary fuel provides the required level of electricity production.



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INTERNATIONAL SEARCH REPORT

Intern ial Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C10B19/00 C10B53/00

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 6 C10B

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,3 841 239 (NAKAMURA ET AL.) 15 October 1974 see claims; figures	1-89
A	US,A,3 779 182 (CAMACHO) 18 December 1973	
A	US,A,5 284 503 (BITLER ET AL.) 8 February 1994 cited in the application	
A	EP,A,0 096 538 (ELECTRO-PETROLEUM) 21 December 1983 cited in the application	

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☒ Patent family members are listed in annex.

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1

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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	Meertens, J

INTERNATIONAL SEARCH REPORT

information on patent family members

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