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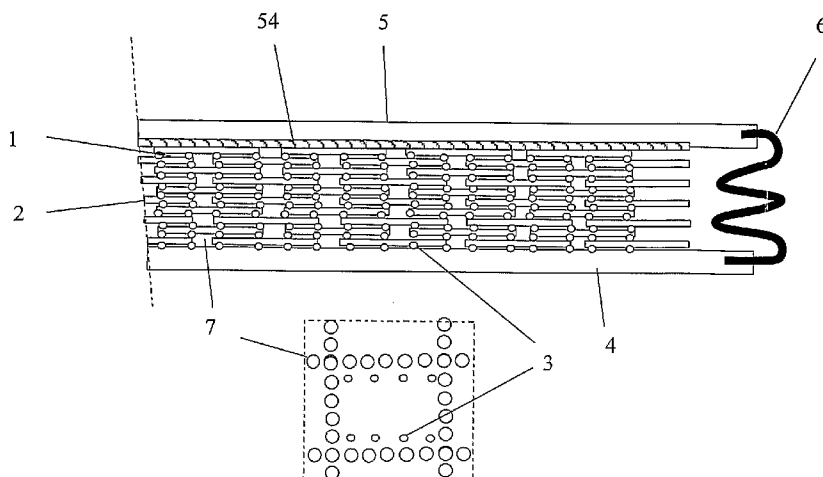
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(54) Title: ENERGY CONVERTING APPARATUS, GENERATOR AND HEAT PUMP PROVIDED THEREWITH AND
METHOD OF PRODUCTION THEREOF



(57) Abstract: A high-efficiency thermionic energy converter comprises a multilayer vacuum diode, the layers of which are very thin and the intermediate spaces between the layers are several nanometres thick. The layers are held at a distance from each other by arranging insulator elements embedded in the layers. One of the intermediate spaces is provided with a thin, open conductive elastic foam plate which fills the spaces possibly occurring due to deformation of an upper electrode. On the cold side the distance between the layers must be so small that here the thermionically generated current is increased by tunneling of electrons from layer to layer. The partial efficiency per layer is as optimal as possible by means of the choice of the geometry and the material. For the purpose of pumping heat from for instance the thick electrode to the other thick electrode of the converter, or vice versa, in accordance with the Peltier effect, a current is conducted through the converter which is increased by tunneling of electrons. Cooling or heating takes place subject to the current direction.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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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)
H01J

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 876 123 B2 (MARTINOVSKY ARTEMY [RU] ET AL MARTINOVSKY ARTEMY [RU] ET AL) 5 April 2005 (2005-04-05) cited in the application column 5, line 10 - column 8, line 30 figures 3a-3c	1-15, 18-48
A	WO 99/13562 A (BOREALIS TECH LTD [US]) 18 March 1999 (1999-03-18) figure 4	3-5
A	US 3 173 032 A (MAYNARD JOHN T) 9 March 1965 (1965-03-09) the whole document	1
A	US 3 169 200 A (HUFFMAN FRED N) 9 February 1965 (1965-02-09) the whole document	1
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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 2003/114906 A1 (BOOKER ROBERT S [US] ET AL) 19 June 2003 (2003-06-19) paragraphs [0019], [0020] -----	16

INTERNATIONAL SEARCH REPORT

Information on patent family members

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