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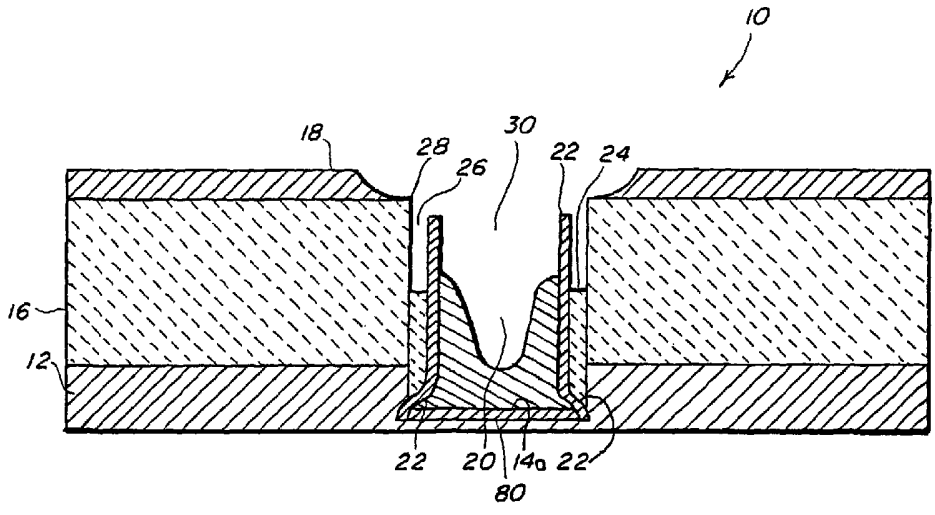
(54) Title: LOW GATE CURRENT FIELD EMITTER CELL AND ARRAY WITH VERTICAL THIN-FILM-EDGE EMITTER



(57) Abstract: A field emitter cell (10) includes a thin film emitter (22) normal to the gate layer (18). The field emitter cell (10) may include a conductive substrate layer (12), and insulator layer (16) having a perforation (30), a gate layer (18) having a perforation, an emitter layer (22), and other optional layers. The perforation in the gate layer (18) is larger and concentrically offset with respect to the perforation (30) in the insulating layer (16) and may be of a tapered construction. Alternatively, the perforation of the gate layer (18) may be coincident, or larger or smaller than, the perforation (30) in the insulating layer (16), provided that the gate layer (18) is shielded from the emitter (22) from a direct line-of-sight by a nonconducting standoff layer. Optionally, the thin-film-edge emitter (22) may include incorporated nanofilaments (50). The field emitter cell (10) has a low gate current, useful for various applications such as field emitter displays, high voltage power switching, RF amplification and other applications that require high emission currents.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01J 9/00, 9/02, 1/30, 1/304, 1/316, 19/24
US CL : 445/24, 49, 50, 51; 313/309, 310, 311, 346R, 351, 336, 495

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)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
JPO, EPO, Derwent, USPAT, USPGPubs

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,170,092 A (TOMII et al.) 08 December 1992 (08.12.1992)	1-47
A	US 5,246,879 A (HSU et al.) 21 September 1993 (21.09.1993)	1-47
A	US 5,382,185 A (GRAY et al.) 17 January 1995 (17.01.1995)	1-47
A	US 5,457,355 A (FLEMING et al.) 10 October 1995 (10.10.1995)	1-47
A, &	US 6,084,245 A (HSU et al.) 04 July 2000 (04.07.2000)	1-47
A, &	US 6,333,598 B1 (HSU et al.) 25 December 2001 (25.12.2001)	1-47
A, &	US 6,440,763 B1 (HSU, DAVID S.Y.) 27 August 2002 (27.08.2002)	1-47

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