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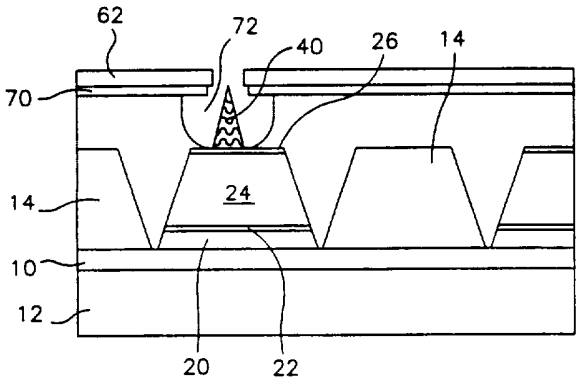
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03 April 1997 (03.04.97)

(54) Title: FIELD EMITTER DEVICE, AND VEIL PROCESS FOR THE FABRICATION THEREOF

(57) Abstract

A field emitter device (Figure 15) formed by a veil process wherein a protective layer including a release layer is deposited on a gate electrode layer (62) for the device, the protective layer overlaying the circumscribing peripheral edge of the opening of the gate electrode layer (62) to protect the edge of the gate electrode layer (62) during etching of a field emitter cavity (72) in a dielectric material layer (30) on a substrate (12) and during the formation of a field emitter element (40) in the cavity by depositing a field emitter material through the opening (72). The protective layer is readily removed subsequent to completion of the cavity etching formation steps, to yield the field emitter device. The field emitter device further includes a current limiter composition (14) for permitting high frequency emission of electrons from the field emitter element (40) at a low turn-on voltage.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/13330

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H01J 1/32, 9/18
US CL :313/310
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)

U.S. : 313/310, 306, 309, 311, 336, 351, 495, 496; 156/625.1, 647.1, 654.1

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 practicable, 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, P	US, A, 5,529,524 (JONES) 25 June 1996, Figures 29, 40, 43c, 61, 70, 92, 123-125, 132-133, 151-152; col. 10, line 18-col. 12, line 67; col. 16, line 58-col. 17, line 26; col. 26, line 37-col. 28, line 4; col. 29, line 35-col. 30, line 32; col. 33, line 11-col.34, line 10	1-16
A	US, A, 5,075,591 (HOLMBERG) 24 December 1991, Figure 2; col. 3, lines 37-58	2-4, 12
A	US, A, 5,404,070 (TSAI ET AL) 04 APRIL 1995, Figures 3a, 4-6, 12, 13; col. 3, line 20-col. 4, line 11	15-16
A	US, A, 3,970,887 (SMITH ET AL) 20 JULY 1976, Figures 1g, 7; col. 4, line 36-col. 6, line 7; col. 9, lines 10-16	15-16

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	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 novel or cannot be considered to involve an inventive step when the document is taken alone
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"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)	"&"	document member of the same patent family
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Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ASHOK PATEL Telephone No. (703) 305-4900

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/13330

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Telephone Practice
Group I. Claims 1-7 and 12-16, drawn to a field emitter structure, a field emitter device and a method of making the field emitter device,
Group II. Claims 8-11, drawn to a field emitter device precursor article.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.