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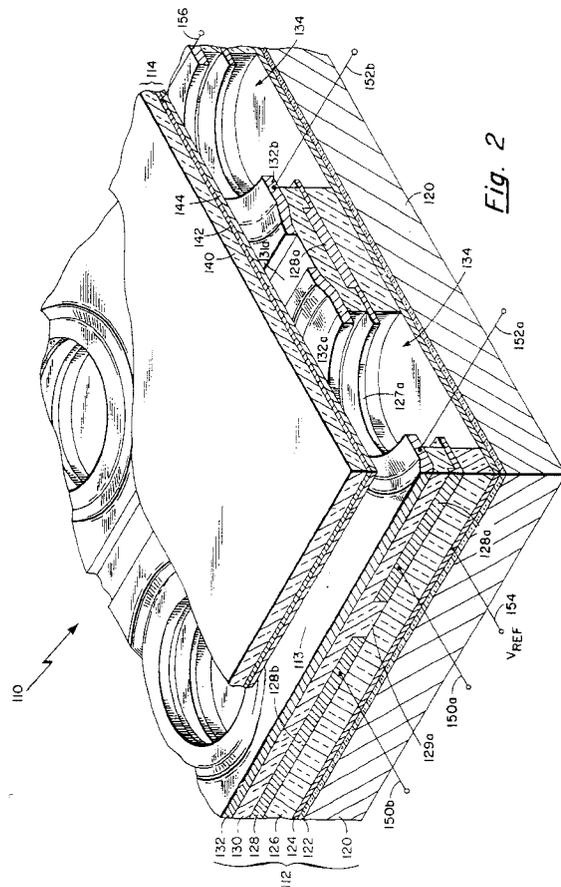
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Electron emitting structure and manufacturing method.

A field emitter includes an electron emitting structure (112) spaced from an anode structure (114), with the intervening gap (113) being substantially evacuated. The electron emitting structure (112) includes a first electrically conductive layer (128) spaced by an insulating layer (130) from a second conductive layer (132), and a generally circular aperture (134) disposed through the layers (128,132). The anode structure (114) includes an electrically conductive layer (142). Electrostatic forces, provided from a potential applied between the first conductive layer (128) and the anode structure (114), cause an electron beam to be drawn from a cathode provided by a peripheral edge portion (127a) of the first conductive layer (128) within the aperture (134) onto an adjacent surface portion of the anode structure (114). Such field emission occurs under the control of a potential applied between the first and second conductive layers (128,132) of the electron emitting structure with the second conductive layer (132) functioning as a control electrode of the emitting structure. The anode structure (114) has a phosphor layer (144) which converts the electrical energy from the electron bombardment into visible light energy. In one embodiment (Fig. 6), a potential applied to a third conductive layer (360) of the emitting structure (312) serves to focus the electron stream on the anode structure (314). Methods of manufacturing the electron emitting structures employ successive steps of layer deposition and subsequent selective etching.



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DOCUMENTS CONSIDERED TO BE RELEVANT			EP 92301632.3
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ⁵)
X	<u>GB - A - 1 389 191</u> (SPERRY) * Page 2, lines 101-130; fig. 2,3; claim 1 *	1-4	H 01 J 1/30 H 01 J 17/49 H 01 J 9/02
X	* Page 2, line 101 - page 3, line 22 *	7,12- 16,27, 28,30	
X	-- <u>US - A - 3 700 946</u> (CARAS) * Column 6, page 63 - column 7, page 10; fig. 9-10	1-4	
X	* Column 2, line 7 - column 3, line 60; column 6, line 63 - column 7, line 10 *	33-36	
X	-- <u>EP - A - 0 394 698</u> (CANON) * Column 5, lines 5-41; fig. 1; claim 1 *	1-3	
X	* Column 5, lines 5-41; fig. 1; column 1; column 7, line 52 - column 8, line 49; fig. 4A *	5-11, 17,29, 31,32, 37,38	TECHNICAL FIELDS SEARCHED (Int. Cl. ⁵) H 01 J
X	-- <u>EP - A - 0 434 001</u> (MATSUSHITA) * Column 20, line 39 - column 21, line 29; fig. 19 *	18-26	
X	-- <u>EP - A - 0 074 440</u> (HANLET) * Page 12, line 24 - page 14, line 8; fig. 1,5 *	33-36	
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 09-09-1992	Examiner SCHLECHTER
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO Form 1503, 03/82



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	CLAIMS INCURRING FEES
<p>The present European patent application comprised at the time of filing more than ten claims.</p> <p><input type="checkbox"/> All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.</p> <p><input type="checkbox"/> Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claims:</p> <p><input type="checkbox"/> No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.</p>	
X	<p>LACK OF UNITY OF INVENTION</p> <p>The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:</p> <p>1. Claims: 1-4; Cathode comprising a sheet of conductive material having an edge</p> <p>2. Claims: 5-32; Combination: Layer of conductive material having an edge and means coupled to said layer for producing an electric field</p> <p>3. Claims: 33-38; Electron emission apparatus</p> <p>4. Claims: 39-56; Method of providing an electron emitting structure</p> <p><input checked="" type="checkbox"/> All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.</p> <p><input type="checkbox"/> Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:</p> <p><input type="checkbox"/> None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:</p>



European Patent Office

EUROPEAN SEARCH REPORT

Application number

-2-

EP 92301632.3

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.) ⁵
X;Y	<p><u>EP - A - 0 010 222</u> (SIEMENS) * Page 5, line 22 - page 7, line 17 *</p>	39-45, 47,48; 46,49-56	
Y;A	<p>-- <u>EP - A - 0 434 001</u> (MATSUSHITA) * Column 21, line 33 - column 22, line 26 *</p>	46;39-56	
Y	<p>-- <u>EP - A - 0 123 496</u> (BURROUGHS) * Page 2, line 24 - page 4, line 19; page 6, lines 3-32 *</p>	49-56	
A	<p>-- <u>US - A - 3 899 707</u> (SASAKI) * Column 2, lines 1-34 *</p>	5-32	
A	<p>-- <u>US - A - 4 388 550</u> (GERHARD H.F. de VRIES) * Column 2, line 52 - column 3, line 23 *</p>	33-36	
			TECHNICAL FIELDS SEARCHED (Int. Cl.) ⁵
The present search report has been drawn up for all claims			
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<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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