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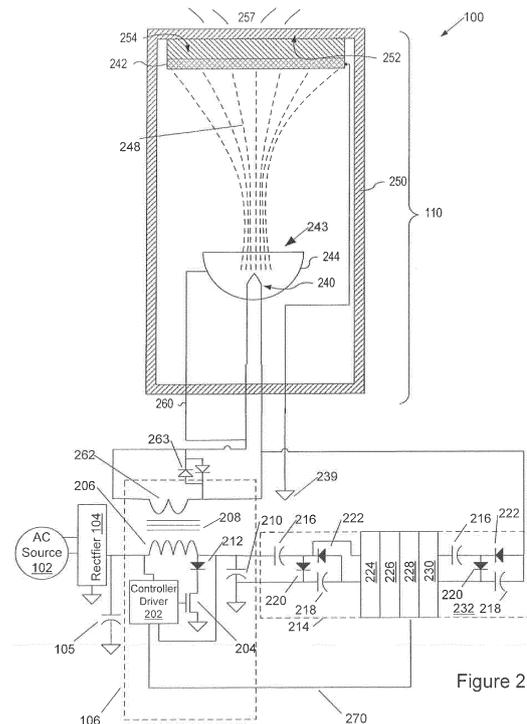
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(54) **Cathodoluminescent lighting system**

(57) Electron sources for a cathodoluminescent lighting system are disclosed. An electron source is a broad-beam reflecting-type electron gun (243) having a cathode (240) for emitting electrons and a reflector and/or secondary emitter electrode and no grids. An alternative electron gun has a cathode having a heater welded to a disk, the disk having an emissive surface on a side facing a dome-shaped defocusing grid and an anode. A lighting system (100) incorporating the electron sources has an envelope (250) with a transparent face (252), an anode (242) with a phosphor layer (254) to emit light through the face and a conductor layer. The system also has a power supply (102, 104, 105, 106, 108) for providing from five to thirty thousand volts of power to the light emitting device to draw electrons from cathode to anode and excite a cathodoluminescent phosphor, and the electrons transiting from cathode to anode are essentially unfocused. A power-factor-corrected embodiment is also disclosed.



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EUROPEAN SEARCH REPORT

Application Number
EP 12 17 3268

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 102 139 A2 (GEN ELECTRIC CO PLC [GB]) 7 March 1984 (1984-03-07)	1,4,7,8, 11,12,15	INV. H01J63/06
Y	* page 5, line 25 - page 6, line 25 * * page 7, line 8 - page 9, line 26; figure 1 *	2,3,6,9	H05B41/14 H01J1/15
Y	----- US 4 499 405 A (LODA GARY K [US]) 12 February 1985 (1985-02-12) * column 5, line 12 - column 6, line 15; figures 1, 2 * * column 7, lines 25-64; figures 7-9 *	2,3,9	
A	----- GB 653 835 A (MARCONI WIRELESS TELEGRAPH CO) 30 May 1951 (1951-05-30) * page 1, line 92 - page 2, line 3; figure 1 *	1,4,9,15	
A	----- US 5 831 397 A (STEVENS JESSICA L [US] ET AL) 3 November 1998 (1998-11-03) * column 4, line 48 - column 6, line 12; figures 1, 2, 7, 8 *	1-4,9,15	
Y	----- WO 2008/098013 A2 (TELEGEN CORP [US]; HUNT CHARLES E [US]; ZANE REGAN ANDREW [US]; HERRIN) 14 August 2008 (2008-08-14) * paragraphs [0009], [0026] - [0031], [0052], [0053], [0058]; figures *	6	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC) H01J
Place of search Munich		Date of completion of the search 27 March 2013	Examiner Schmidt-Kärst, S
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	

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EPC FORM 1503 03-82 (F04C01)



Application Number

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.
- 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:
- None 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 invention first mentioned in the claims, namely claims:
- 1-4, 6-9, 11, 12, 15
- The present supplementary 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 (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 12 17 3268

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-4, 6-9, 11, 12, 15

Cathodoluminescent lighting system comprising a light emitting device with a thermionic cathode and a reflector electrode, wherein no grid is interposed between the cathode and the anode

1.1. claims: 3, 4, 9

Cathodoluminescent lighting system comprising a light emitting device with a thermionic cathode and a reflector electrode, wherein the reflector is arranged at a certain distance with respect to the cathode and/or the reflector is curved

1.2. claim: 6

Cathodoluminescent lighting system comprising a light emitting device with a thermionic cathode and a reflector electrode, comprising a power supply capable of detecting phase changes in incoming AC power induced by an external dimmer, and capable of responding to phase changes by altering a temperature of the cathode to change a level of emitted light

2. claim: 5

Cathodoluminescent lighting system comprising a light emitting device with a thermionic cathode and a reflector electrode, wherein the cathode is a filament coiled into hemispherical shape

3. claims: 10, 13

Cathodoluminescent lighting system comprising a light emitting device with a thermionic cathode and a reflector electrode, wherein the cathode has an essentially tapered or conical shape

4. claim: 14

Cathodoluminescent lighting system comprising a light emitting device with a thermionic cathode and a reflector electrode, wherein the reflector electrode is biased positive with respect to the cathode

Please note that all inventions mentioned under item 1, although not



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 12 17 3268

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

necessarily linked by a common inventive concept, could be searched without effort justifying an additional fee.

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

27-03-2013

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