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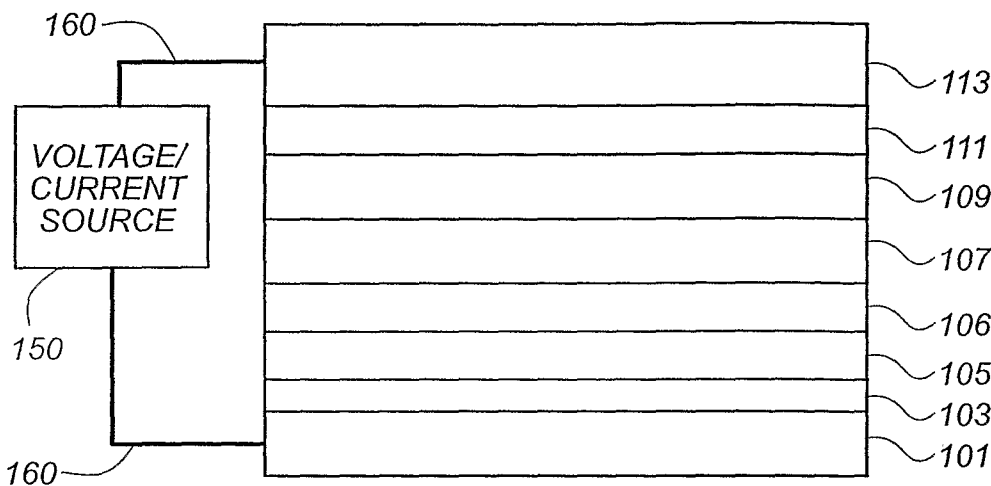
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(88) Date of publication of the international search report:
13 December 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ELECTROLUMINESCENT DEVICE CONTAINING AN ANTHRACENE DERIVATIVE



(57) Abstract: An OLED device comprises a cathode (113), an anode (103), and located therebetween a light emitting layer (109), the device comprising a further layer (106) between the light-emitting layer and the anode but not contiguous to the light-emitting layer (109), the further layer (106) containing a 2, 6 -diamino- substituted anthracene compound and containing a larger volume percentage of the 2,6-diamino-substituted anthracene compound than the layer (107) contiguous to the light-emitting layer (109) on the anode side.

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/045730

A. CLASSIFICATION OF SUBJECT MATTER

INV. H01L51/54

ADD. H01L51/52

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)

H01L C09K

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2004 091334 A (MITSUBISHI CHEM CORP) 25 March 2004 (2004-03-25)	1-3,20, 21
Y	tables 1-10 paragraphs [0076], [0077], [0109], [0123]; figures 2,3	4,7-9
X	EP 1 061 112 A1 (IDEMITSU KOSAN CO [JP]) 20 December 2000 (2000-12-20)	1
Y	paragraphs [0206], [0207] paragraph [0054]; compounds 90,92,101	4,7-9
Y	JP 2004 095850 A (MITSUBISHI CHEM CORP) 25 March 2004 (2004-03-25)	4,7-9
Y	paragraphs [0008], [0025], [0046]	
Y	US 2005/260442 A1 (YU CHEN-PING [TW] ET AL) 24 November 2005 (2005-11-24)	4,7-9
	paragraphs [0011], [0030]	

 Further documents are listed in the continuation of Box C.

 See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"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

"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

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

26 July 2007

Date of mailing of the international search report

26.10.07

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/045730

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search 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.: **5,10,11,12,20(in part)**
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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 III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

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.:
1-4, 7-9, 20, 21

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 5,10,11,12,20(in part)

Present claims 5, 10, 11, 12, and 20 (in part) relate to a device characterised by a chemical compound which has a given desired property, namely a specific oxidation potential. However, the description does not provide general disclosure in the sense of Article 6 and 5 PCT for any such a compound having the said property and there is no common general knowledge of this kind available to the person skilled in the art. The description only gives examples of compounds which appear to exhibit the desirable property but does not explain which molecular characteristics result in this specific oxidation potential. This non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search of the claim (PCT Guidelines 9.19 and 9.20).

The search of claims 5, 10, 12, and 20 (in part) was consequently restricted to the specifically and explicitly disclosed compounds having the desired property, see description pages 9 to 17, and not to the broad concept of a compound having the desired property of a specific oxidation potential.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4,7-9,20,21

2,6-diamino substituted anthracene compound as further layer
(hole injection or second hole transport layer) in OLED

2. claim: 6

include a dopant possessing electron withdrawing properties
in the 2,6-diamino substituted anthracene comprising layer

3. claims: 13, 14

specific the material for the electroluminescent layer to be
a benzidine derivative

4. claim: 15

provide an additional layer between the 2,6-diamino
substituted anthracene layer and the anode

5. claims: 16-19, 22,23

provide a second light emitting layer or a stacked OLED

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/045730

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 2005260442	A1	24-11-2005	NONE