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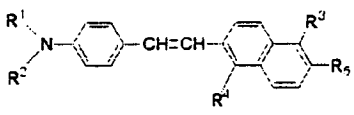
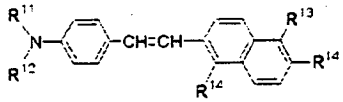
(54) Organic electroluminescent devices, aminostyrylnaphthalene compounds and synthesis intermediates thereof, and production processes of the same

(57) An organic electroluminescent device includes an anode, a cathode, and an organic layer having a light-emitting area and arranged between the anode and the cathode. The organic layer contains in at least a part thereof at least one aminostyrylnaphthalene compound represented by the following formula [I], [II] or [III]:

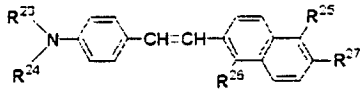
[I] :



[II] :



[III] :



wherein R^1, R^2, R^{11}, R^{12}, R^{23} and R^{24} are each a phenyl or naphthyl group, R^3, R^4, R^{13}, R^{14}, R^{25} and R^{26} are each an electron attracting group such as a cyano group, and R^5, R^{15} and R^{27} are each a substituent group such as an alkyl group.

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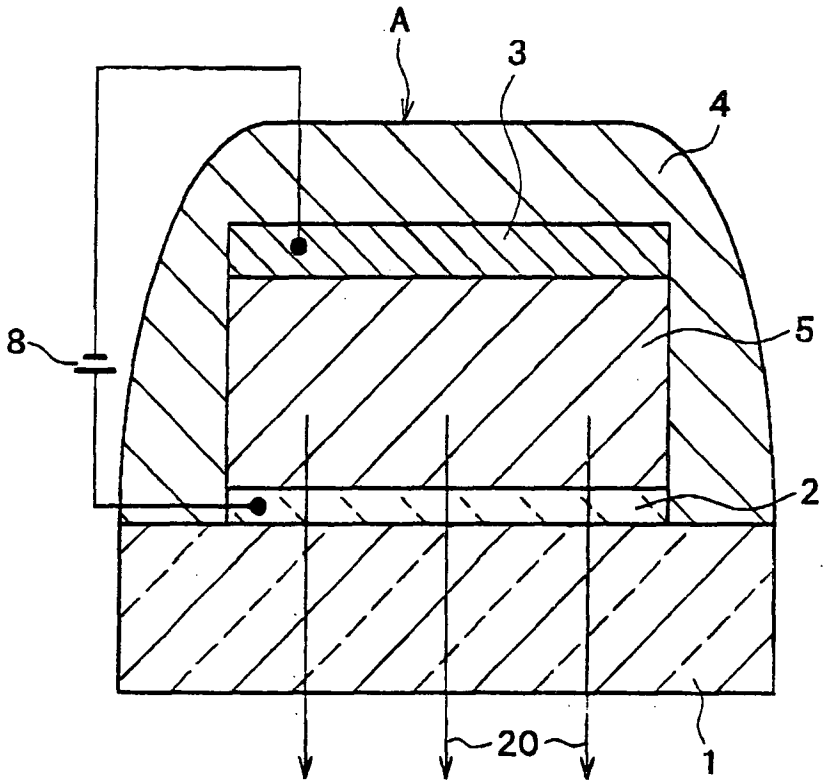
FIG. 1



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EUROPEAN SEARCH REPORT

Application Number
EP 04 00 7087

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 1 092 704 A2 (SONY CORP [JP]) 18 April 2001 (2001-04-18) * paragraph [0036] - paragraph [0056] * * pages 11-16 * * pages 38-52 * -----	1-14	INV. H05B33/14 C09K11/06 H01L51/00

TECHNICAL FIELDS SEARCHED (IPC)

H05B
C09K
H01L
C07C
C07F

~~The present search report has been drawn up for all claims~~

Place of search	Date of completion of the search	Examiner
Munich	8 March 2007	Doslik, Natasa

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 (P04C01)

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ Only part of the claims 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 claim(s):

☐ 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.

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:

see annex

European Patent Office

LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 04 00 7087

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: 1-14

The first group of inventions discloses an organic EL device with anode, cathode and at least one organic layer comprising at least one aminostyrylnaphthalene compound as defined by formula [A] of claim 1. Additionally, the product per se, aminostyrylnaphtalene and it process for manufacture is disclosed.

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2. claims: 15-22

The second group of inventions discloses a phosphonate ester or phosphonium and their processes for manufacture.

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3. claims: 23-26

The third group of inventions discloses a halogenated aryl compound as defined by formula [E] in claim 23 and its process for manufacture.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 00 7087

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.

08-03-2007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1092704 A2	18-04-2001	DE 60026418 T2	02-11-2006
		JP 2001106658 A	17-04-2001

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

专利名称(译)	有机电致发光器件，氨基苯乙烯基萘化合物及其合成中间体及其制备方法		
公开(公告)号	EP1473349A3	公开(公告)日	2007-07-18
申请号	EP2004007087	申请日	2004-03-24
[标]申请(专利权)人(译)	索尼公司		
申请(专利权)人(译)	索尼公司		
当前申请(专利权)人(译)	索尼公司		
[标]发明人	ICHIMURA MARI ISHIBASHI TADASHI TAMURA SHINICHIRO		
发明人	ICHIMURA, MARI ISHIBASHI, TADASHI TAMURA, SHINICHIRO		
IPC分类号	H05B33/14 C09K11/06 H01L51/00 H01L51/50 C07C253/30 C07C255/52 C07C255/58 C07C255/59 C07F9/40 C07F9/54 C09B57/00		
CPC分类号	H01L51/0052 C07C255/58 C07C255/59 C07F9/4056 C07F9/5456 C09K11/06 C09K2211/1011 C09K2211/1014 H01L51/0059 H01L51/006 H01L51/0081 H01L51/5012 H01L51/5048 H01L2251/308 H05B33/14 Y10S428/917		
优先权	2003079768 2003-03-24 JP 2004033056 2004-02-10 JP		
其他公开文献	EP1473349A2		
外部链接	Espacenet		

摘要(译)

有机电致发光器件包括阳极，阴极和具有发光区域并且布置在阳极和阴极之间的有机层。有机层在其至少一部分中含有至少一种由下式[I]，[II]或[III]表示的氨基苯乙烯基萘化合物：其中R1，R2，R11，R12，R23和R24各自为苯基或萘基基团R 3，R 4，R 13，R 14，R 25和R 26各自是诸如氰基的吸电子基团，并且R 5，R 15和R 27各自是诸如烷基的取代基。