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(54) **Electron transport compound and organic light emitting device comprising the same**

(57) An organic light emitting device having a pyrene based electron transport compound and an electron injecting and transport layer comprising the electron transport compound is provided.

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EUROPEAN SEARCH REPORT

Application Number
EP 07 00 0776

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	PARK Y H ET AL: "Theoretical investigation of tetra-substituted pyrenes for organic light emitting diodes" CURRENT APPLIED PHYSICS, NORTH-HOLLAND LNKD- DOI:10.1016/J.CAP.2005.04.021, vol. 6, no. 4, 26 May 2005 (2005-05-26), pages 691-694, XP024973364 ISSN: 1567-1739 [retrieved on 2006-07-01] * the whole document *	1-12	INV. H01L51/00 H01L51/52
A	US 2003/157365 A1 (KINOSHITA MASARU [JP] ET AL) 21 August 2003 (2003-08-21) * the whole document *	1-12	
A	US 2005/238920 A1 (SOTOYAMA WATARU [JP] ET AL) 27 October 2005 (2005-10-27) * the whole document *	1-12	
X,P	WO 2006/057325 A1 (UNIV KYOTO [JP]; NIPPON TELEGRAPH & TELEPHONE [JP]; PIONEER CORP [JP];) 1 June 2006 (2006-06-01) * abstract; figure 2 *	13-18	TECHNICAL FIELDS SEARCHED (IPC) H01L
A	US 2004/265629 A1 (WANG SUNING [CA] ET AL) 30 December 2004 (2004-12-30) * the whole document *	13	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 30 June 2010	Examiner Königstein, C
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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EPO FORM 1503 03.82 (P04C01)



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:
- 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 07 00 0776

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: 1-12

Electron transport compounds based on symmetric
1,6-arylene-heteroaryl-3,8-aryl pyrene

2. claims: 13-18

Electron transport compounds based on asymmetric
1-heteroaryl-3,6,8-aryl pyrene

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

EP 07 00 0776

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.

30-06-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003157365 A1	21-08-2003	JP 3841695 B2 JP 2003234190 A	01-11-2006 22-08-2003
-----	-----	-----	-----
US 2005238920 A1	27-10-2005	WO 2004096945 A1	11-11-2004
-----	-----	-----	-----
WO 2006057325 A1	01-06-2006	EP 1818322 A1 JP 2006176494 A KR 20070093401 A US 2008012475 A1	15-08-2007 06-07-2006 18-09-2007 17-01-2008
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US 2004265629 A1	30-12-2004	NONE	
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EPO FORM P0459

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

专利名称(译)	电子传输化合物和包含其的有机发光器件		
公开(公告)号	EP1808912A3	公开(公告)日	2010-08-11
申请号	EP2007000776	申请日	2007-01-16
申请(专利权)人(译)	LG电子株式会社.		
当前申请(专利权)人(译)	LG DISPLAY CO. , LTD.		
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发明人	KIM, JUNG KEUN SEO, JEONGDAE JEONG, HYUN CHEOL BIN, JONG KWAN PARK, CHUNGUN		
IPC分类号	H01L51/00 H01L51/52		
CPC分类号	H01L51/0054 H01L51/0067 H01L51/0081 H01L51/5048 Y10S428/917		
代理机构(译)	庆祝活动 , JENTSCHURA & PARTNER		
优先权	1020060004687 2006-01-16 KR 1020060004688 2006-01-16 KR 1020060004689 2006-01-16 KR		
其他公开文献	EP1808912A2 EP1808912B1		
外部链接	Espacenet		

摘要(译)

提供一种具有苊基电子传输化合物的有机发光器件和包含该电子传输化合物的电子注入和传输层。

		EUROPEAN SEARCH REPORT		Application Number EP 07 00 0776
DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
A	PARK Y H ET AL: "Theoretical investigation of tetra-substituted pyrenes for organic light emitting diodes." CURRENT APPLIED PHYSICS, NORTH-HOLLAND INC- DOI:10.1016/J.CAP.2005.04.021 vol. 6, no. 4, 26 May 2005 (2005-05-26), pages 691-694, XP024973364 ISSN: 1567-1739 [retrieved on 2006-07-01] * the whole document. -----	1-12	INV H01L51/00 H01L51/52	
A	US 2003/157365 A1 (KINOSHITA MASARU [JP] ET AL) 21 August 2003. (2003-08-21) * the whole document. -----	1-12		
A	US 2005/238920 A1 (SOTOYAMA WATARU [JP] ET AL) 27 October 2005. (2005-10-27) * the whole document. -----	1-12		
X,P	WO 2006/057325 A1 (UNIV KYOTO [JP]; NIPPON TELEGRAPH & TELEPHONE [JP]; PIONEER CORP [JP]) 1 June 2006 (2006-06-01) * abstract; figure 2. -----	13-18	TECHNICAL FIELD SEARCHED (IPC)	
A	US 2004/265629 A1 (WANG SUNING [CA] ET AL) 30 December 2004 (2004-12-30) * the whole document. -----	13	H01L	
The present search report has been drawn up for all claims				
Filed at: The Hague		Date of publication of this report: 30 June 2010		Applicant: Königstein, C
CATEGORY OF CITED DOCUMENTS				
<input type="checkbox"/> particularly relevant if taken alone <input type="checkbox"/> pertinent to the claim considered with another claim <input type="checkbox"/> non-pertinent <input type="checkbox"/> not searched		<input type="checkbox"/> theory of possible underlying the invention <input type="checkbox"/> under patent document, but publication or after the filing date the application <input type="checkbox"/> document cited for other reasons <input type="checkbox"/> material of the same patent family, corresponding document		