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(54) **Electroluminescent display device**

(57) The present invention relates to an organic electroluminescent device. There is provided an organic electroluminescent device with a good luminescence property and high luminous efficiency in which the organic electroluminescent device has a diffraction grating 2 on

the surface of the substrate 1 and an organic EL layer 5 including an emission layer between an anode 4 and a cathode 6 via an intermediate layer 3.

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EUROPEAN SEARCH REPORT

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EP 04 09 0192

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	JP 11 329742 A (IDEMITSU KOSAN CO) 30 November 1999 (1999-11-30) * abstract; figures *	1-4,6-8,10	INV. H01L51/20
X	WO 02/35890 A (MATSUSHITA ELECTRIC IND CO LTD [JP]; SUGIURA HISANORI [JP]; SATO TETSU) 2 May 2002 (2002-05-02) * figure 5 *	1-4,6-8	
P,X	& US 2004/012980 A1 (SUGIURA HISANORI [JP] ET AL SUGIURA HISANORI [JP] ET AL) 22 January 2004 (2004-01-22) * paragraphs [0125] - [0129], [0169] - [0173]; figure 5; examples 9,10 *	1-4,6-8	
X	US 2002/180348 A1 (ODA ATSUSHI [JP] ET AL) 5 December 2002 (2002-12-05) * figure 2; example 3 *	1-3,5-7	
X	WO 03/026357 A (NISSAN CHEMICAL IND LTD [JP]; OOTSUKA YOSHIKAZU [JP]; ABE TOYOHICO [JP]) 27 March 2003 (2003-03-27) * page 8; figures * * abstract *	1-3,10	TECHNICAL FIELDS SEARCHED (IPC)
E	& EP 1 435 762 A (NISSAN CHEMICAL IND LTD [JP]) 7 July 2004 (2004-07-07) * paragraphs [0015], [0020], [0025], [0028] *	1-3	H01L
P,X	EP 1 387 406 A (FUJITSU LTD [JP]) 4 February 2004 (2004-02-04) * paragraphs [0019], [0024] - [0026]; figure 8 *	1-3,7,8	
E	WO 2004/084323 A (SIEMENS AG [DE]; ROGLER WOLFGANG [DE]; SCHEFFEL MARCUS [DE]; TSCHAMBER) 30 September 2004 (2004-09-30) * page 8, lines 23-31; figure 2 *	1-3,10	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 11 June 2007	Examiner De Laere, Ann
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 09 0192

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
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11-06-2007

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 11329742	A	30-11-1999	NONE	
WO 0235890	A	02-05-2002	TW 527848 B	11-04-2003
			US 2004012980 A1	22-01-2004
US 2004012980	A1	22-01-2004	WO 0235890 A1	02-05-2002
			TW 527848 B	11-04-2003
US 2002180348	A1	05-12-2002	JP 2991183 B2	20-12-1999
			JP 11283751 A	15-10-1999
			JP 11283751 T1	15-10-1999
			US 6476550 B1	05-11-2002
WO 03026357	A	27-03-2003	CN 1554212 A	08-12-2004
			EP 1435762 A1	07-07-2004
			US 2004241421 A1	02-12-2004
EP 1435762	A	07-07-2004	CN 1554212 A	08-12-2004
			WO 03026357 A1	27-03-2003
			US 2004241421 A1	02-12-2004
EP 1387406	A	04-02-2004	CN 1479560 A	03-03-2004
			JP 2004111354 A	08-04-2004
			KR 20040010342 A	31-01-2004
			TW 222335 B	11-10-2004
			US 2006009133 A1	12-01-2006
			US 2004017152 A1	29-01-2004
WO 2004084323	A	30-09-2004	NONE	

专利名称(译)	电致发光显示装置		
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代理机构(译)	hengelhaupt , Jürgen		
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其他公开文献	EP1480281A2		
外部链接	Espacenet		

摘要(译)

有机电致发光器件本发明涉及有机电致发光器件。本发明提供一种有机电致发光器件，其具有良好的发光性能和高发光效率，其中有机电致发光器件在基板1的表面上具有衍射光栅2，并且有机EL层5包括在阳极4和a之间的发光层。阴极6通过中间层3。

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Relevance to document (classification of relevance)	Relevance to claims (classification of relevance)	Classification of the application (IPC)
X	JP 11 329742 A (IDEMITSU KOSAN CO) 30 November 1999 (1999-11-30) * abstract; figures 1-4, 6-8, 10	1-4, 6-8, 10	INV. H01L51/20
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P.X	& US 2004/012980 A1 (SUGIURA HISANORI [JP] ET AL SUGIURA HISANORI [JP] ET AL) 22 January 2004 (2004-01-22) * paragraphs [0155], [0129], [0169] - [0173]; figure 5; examples 9, 10	1-4, 6-8	
X	US 2002/180348 A1 (ODA ATSUSHI [JP] ET AL) 5 December 2002 (2002-12-05) * figure 2; example 3	1-3, 5-7	
X	WO 03/026357 A (NISSAN CHEMICAL IND LTD [JP]; OOTSUKA YOSHIKAZU [JP]; ABE TOYOHICO [JP] 27 March 2003 (2003-03-27) * page 8; figures 1-3, 10	1-3, 10	
E	& abstract EP 1 435 762 A (NISSAN CHEMICAL IND LTD [JP]) 7 July 2004 (2004-07-07) * paragraphs [0015], [0020], [0025], [0028]	1-3	H01L 51/20
P.X	EP 1 387 406 A (FUJITSU LTD [JP]) 4 February 2004 (2004-02-04) * paragraphs [0019], [0024] - [0026]; figure 5	1-3, 7, 8	
E	WO 2004/084323 A (SIEMENS AG [DE]; ROGIER WOLFGANG [DE]; SCHEFFEL MARCUS [DE]; SCHAMBER) 30 September 2004 (2004-09-30) * page 8, lines 23-31; figure 2	1-3, 10	

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

Date of search

Date of completion of the search

11 June 2007

Examiner

De Laere, Ann

CATEGORY OF OTHER DOCUMENTS

X : particularly relevant if taken alone
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