



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
02.03.2011 Bulletin 2011/09

(51) Int Cl.:
H01L 27/32^(2006.01)

(43) Date of publication A2:
08.12.2010 Bulletin 2010/49

(21) Application number: **10009816.9**

(22) Date of filing: **11.04.2002**

(84) Designated Contracting States:
DE FI FR GB NL

(30) Priority: **23.04.2001 JP 2001124964**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
02008325.9 / 1 253 643

(71) Applicant: **Semiconductor Energy Laboratory Co, Ltd.**
Atsugi-shi, Kanagawa 243-0036 (JP)

(72) Inventor: **Satake, Rumo**
Atsugi-shi,
Kanagawa 243-0036
(JP)

(74) Representative: **Grünecker, Kinkeldey,**
Stockmair & Schwanhäusser
Anwaltssozietät
Leopoldstrasse 4
80802 München (DE)

(54) **Display device and method of manufacturing the same**

(57) A display device using an organic light emitting element is provided which is structured so as to ensure excellent display performance by avoiding dot defect and improve long-tenn reliability. The distance between an organic light emitting element and a sealing substrate is controlled using the top of a bank that is placed in a pixel portion and the top of an insulating film that is placed in

a driving circuit portion. As a result, a gap is provided between the organic light emitting element and the sealing substrate and a damage to the organic light emitting element can be avoided. Furthermore, the sealing substrate can be as close to an element substrate as possible, thereby keeping the amount of moisture that enters the display device from its sides small.

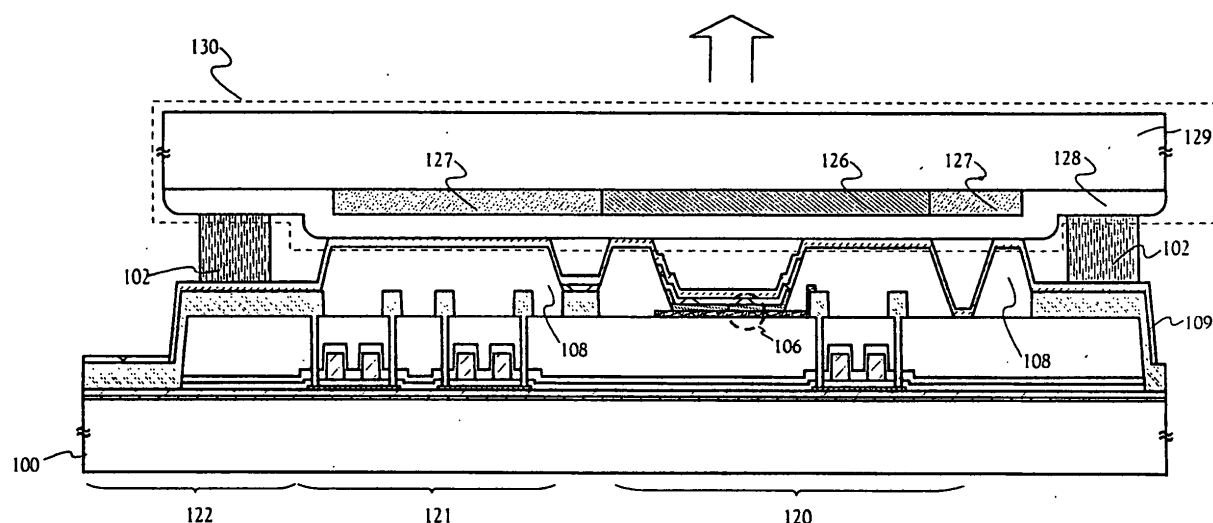


FIG. 2



EUROPEAN SEARCH REPORT

Application Number
EP 10 00 9816

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 1 093 166 A2 (SEMICONDUCTOR ENERGY LAB [JP]) 18 April 2001 (2001-04-18)	1,4	INV. H01L27/32
Y	* paragraphs [0079], [0084], [0112] - [0115], [0120], [0121], [0148], [0166], [0218] - [0223]; figures 11b,13,20 *	1,2,4	
Y	EP 0 884 930 A (IDEMITSU KOSAN COMPANY LIMITED) 16 December 1998 (1998-12-16) * page 2, lines 41-55 * * page 6, lines 39-58 - page 7, lines 1-9 * * page 7, lines 36-39 - lines 48-58 * * page 8, lines 4-9 *	1,2,4	
A	GB 2 297 647 A (FUTABA DENSHI KOGYO KABUSHIKI KAISHA; * FUTABA DENSHI KOGYO KABUSHIKI) 7 August 1996 (1996-08-07) * figure 2 * * page 4, paragraphs 3,4 - page 5 * * page 7, paragraphs 2,3 * * page 12, last paragraph - page 13, paragraph 1 *	1-4	
A	JP 11 297477 A (TDK CORP) 29 October 1999 (1999-10-29) * figure 1 *	1-4	
A	JP 11 251059 A (SANYO ELECTRIC CO) 17 September 1999 (1999-09-17) * figure 1 *	1-4	
A	EP 0 895 219 A1 (SEIKO EPSON CORP [JP]) 3 February 1999 (1999-02-03) * paragraph [0068]; figures 6A,14b *	1-4	TECHNICAL FIELDS SEARCHED (IPC) H01L
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 January 2011	Examiner Faou, Marylène
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			

 1
EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 10 00 9816

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	EP 0 940 796 A1 (SEIKO EPSON CORP [JP]) 8 September 1999 (1999-09-08) * paragraphs [0052] - [0056]; figures 4,5 * -----	1-4	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 January 2011	Examiner Faou, Marylène
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	

1
EPO FORM 1503 03.82 (P04C01)

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

EP 10 00 9816

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.

19-01-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1093166	A2	18-04-2001	CN 1291792 A	18-04-2001
			CN 101118923 A	06-02-2008
			JP 2008204961 A	04-09-2008
			KR 20010082530 A	30-08-2001
			KR 20050104316 A	02-11-2005
			KR 20070072441 A	04-07-2007
			KR 20070112447 A	26-11-2007
			TW 468283 B	11-12-2001
			US 2009109143 A1	30-04-2009
			US 2009269871 A1	29-10-2009
			US 7473928 B1	06-01-2009
EP 0884930	A	16-12-1998	WO 9731508 A1	28-08-1997
			JP 3247388 B2	15-01-2002
			US 6175186 B1	16-01-2001
GB 2297647	A	07-08-1996	DE 19603451 A1	01-08-1996
			JP 3208638 B2	17-09-2001
			JP 8202287 A	09-08-1996
JP 11297477	A	29-10-1999	NONE	
JP 11251059	A	17-09-1999	US 2001026127 A1	04-10-2001
EP 0895219	A1	03-02-1999	CN 1506928 A	23-06-2004
			CN 1506929 A	23-06-2004
			CN 1506930 A	23-06-2004
			CN 1217807 A	26-05-1999
			DE 69829084 D1	24-03-2005
			DE 69829084 T2	29-12-2005
			WO 9836407 A1	20-08-1998
			JP 3528182 B2	17-05-2004
			JP 2008287288 A	27-11-2008
			JP 2009187019 A	20-08-2009
			KR 20050056203 A	14-06-2005
			KR 20050104425 A	02-11-2005
			KR 20050103517 A	31-10-2005
			KR 20050103518 A	31-10-2005
			KR 20050103982 A	01-11-2005
			TW 491985 B	21-06-2002
			TW 578130 B	01-03-2004
			US 2008246700 A1	09-10-2008
			US 2002024493 A1	28-02-2002
			US 2010066652 A1	18-03-2010
			US 2010097410 A1	22-04-2010

EPO FORM P0459

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

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

EP 10 00 9816

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.

19-01-2011

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 0940796	A1	08-09-1999	CN	1242855 A	26-01-2000
			DE	69829357 D1	21-04-2005
			DE	69829357 T2	28-07-2005
			WO	9910861 A1	04-03-1999
			JP	3580092 B2	20-10-2004
			JP	11065487 A	05-03-1999
			TW	430776 B	21-04-2001
			US	6373453 B1	16-04-2002

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)	显示装置及其制造方法		
公开(公告)号	EP2259323A3	公开(公告)日	2011-03-02
申请号	EP2010009816	申请日	2002-04-11
[标]申请(专利权)人(译)	株式会社半导体能源研究所		
申请(专利权)人(译)	半导体能源研究所CO. , LTD.		
当前申请(专利权)人(译)	半导体能源研究所CO. , LTD.		
[标]发明人	SATAKE RUMO		
发明人	SATAKE, RUMO		
IPC分类号	H01L27/32 H05B33/04 G09F9/30 H01L21/77 H01L21/84 H01L27/12 H01L51/50 H01L51/52 H05B33/10 H05B33/12 H05B33/22 H05B33/24 H05B33/26		
CPC分类号	H01L27/3246 H01L27/12 H01L27/1214 H01L27/322 H01L27/3276 H01L51/524 H01L51/5246 H01L51/525 H01L51/5253 H01L51/56 H01L2251/5315		
优先权	2001124964 2001-04-23 JP		
其他公开文献	EP2259323B1 EP2259323A2		
外部链接	Espacenet		

摘要(译)

提供一种使用有机发光元件的显示装置，其构造为通过避免点缺陷和提高长期可靠性来确保优异的显示性能。使用放置在像素部分中的堤的顶部和放置在驱动电路部分中的绝缘膜的顶部来控制有机发光元件和密封基板之间的距离。结果，在有机发光元件和密封基板之间提供间隙，并且可以避免对有机发光元件的损坏。此外，密封基板可以尽可能靠近元件基板，从而保持从侧面进入显示装置的水分量较小。

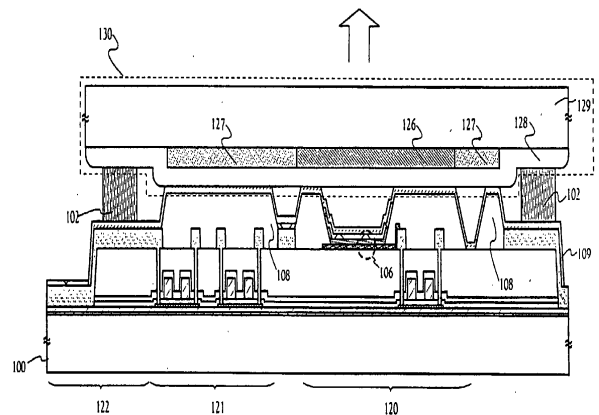


FIG. 2