(19) Europäisches Patentamt
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(11) EP 1 492 390 A3

# (12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
**31.03.2010 Bulletin 2010/13**

(43) Date of publication A2:
**29.12.2004 Bulletin 2004/53**

(21) Application number: **04014267.1**

(22) Date of filing: **17.06.2004**

(51) Int Cl.:
***H05B 33/14*** *(2006.01)*

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
**AL HR LT LV MK**

(30) Priority: **27.06.2003 JP 2003184354**

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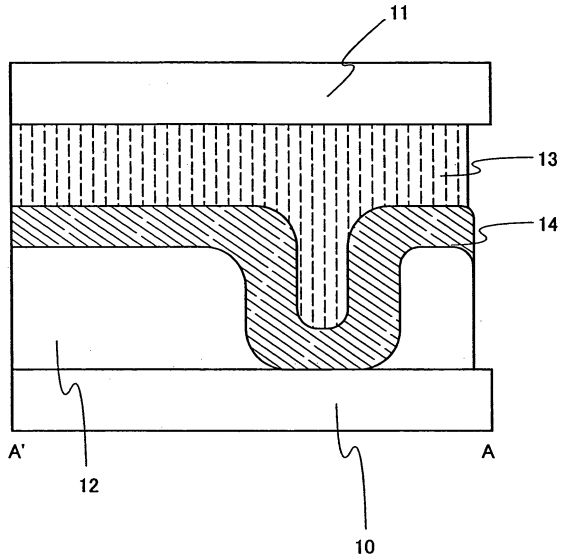
## (54) Display device and method of manufacturing thereof

(57) A novel display device with higher reliability having a structure of blocking moisture and oxygen, which deteriorate the characteristics of the display device, from penetrating through a sealing region and a method of manufacturing thereof is provided. According to the present invention, a display device and a method of manufacturing the same comprising: a display portion formed by aligning a light-emitting element using an organic light-emitting material between a pair of substrate, wherein the display portion is formed on an insulating layer formed on any one of the substrates, the pair of substrates is bonded to each other with a sealing material formed over the insulating layer while surrounding a periphery of the display portion, at least one layer of the insulating layer is made of an organic resin material, the periphery has a first region and a second region, the insulating layer in the first region has an opening covered with a protective film, the sealing material is formed in contact with the opening and the protective film, an outer edge portion of the insulating layer in the second region is covered with the protective film or the sealing material.

FIG. 1

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# PARTIAL EUROPEAN SEARCH REPORT

Application Number EP 04 01 4267

which under Rule 63 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

## 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 | US 2003/094615 A1 (YAMAZAKI SHUNPEI [JP] ET AL) 22 May 2003 (2003-05-22) * paragraphs [0050] - [0078]; figures 1,4,5,15-17,22 * | 1-25, 47-53 | INV. H05B33/14 |
| A | US 2002/180371 A1 (YAMAZAKI SHUNPEI [JP] ET AL) 5 December 2002 (2002-12-05) * paragraph [0098] - paragraph [0108]; figures 1-15 * | 1,10 | |

TECHNICAL FIELDS SEARCHED (IPC)

H01L

## INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 22 February 2010 | Boetticher, Harald |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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D : document cited in the application
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& : member of the same patent family, corresponding document

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EPO FORM 1503 03.82 (P04E07)

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**INCOMPLETE SEARCH**
**SHEET C**

Application Number
EP 04 01 4267

Claim(s) completely searchable:
1-25

Claim(s) not searched:
26-74

Reason for the limitation of the search:

An insulating layer with a plurality of depressions and projections in independent claims 26, 33, 40, 54, 61, 68 lacks support. A depression extends downwards from a top surface, whereas a projection extends upwards. Fig. 11 shows depressions 1121a, 1121b, 1121c extending downwards with respect to the top surface of interlayer 1124, and projections 1120a, 1120b, 1120c extending above the surface of the substrate 1123, as described correctly at page 35, first paragraph; the same applies for Fig. 16 and the text at pages 36, 37. Thus, claims 26, 33, 40, 54, 61, 68 have to be modified to allow a meaningful search, and asking for additional search fees due to a lack of unity resulting from the prior art US 2003/0094615, Figs. 1, 5, 15 to 17 was considered inappropriate.

## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 01 4267

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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22-02-2010

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 2003094615 A1 | 22-05-2003 | NONE | |
| US 2002180371 A1 | 05-12-2002 | US 2006199461 A1 | 07-09-2006 |

EPO FORM P0459

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

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|---|---|---|---|
| 专利名称(译) | 显示装置及其制造方法 | | |
| 公开(公告)号 | EP1492390A3 | 公开(公告)日 | 2010-03-31 |
| 申请号 | EP2004014267 | 申请日 | 2004-06-17 |
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| IPC分类号 | H05B33/14 G02F1/1333 H05B33/04 H05B33/10 H05B33/12 H05B33/22 | | |
| CPC分类号 | H01L51/5246 H01L23/564 H01L27/124 H01L27/3246 H01L27/3258 H01L27/3262 H01L27/3276 H01L33/44 H01L51/5237 H01L2227/323 H01L2251/5323 H05B33/04 H05B33/14 Y10T428/24777 | | |
| 优先权 | 2003184354 2003-06-27 JP | | |
| 其他公开文献 | EP1492390A2<br>EP1492390B1 | | |
| 外部链接 | Espacenet | | |


摘要(译)

本发明提供一种具有更高可靠性的新型显示装置及其制造方法，该显示装置具有阻挡湿气和氧气的结构，该结构使显示装置的特性劣化，不会穿透密封区域。根据本发明，显示装置及其制造方法包括：显示部分，其通过使用有机发光材料在一对基板之间对准发光元件而形成，其中显示部分形成在一对基板上。形成在任何一个基板上的绝缘层，所述一对基板通过在所述绝缘层上形成的密封材料彼此接合，同时围绕所述显示部分的周边，所述绝缘层的至少一层由有机层制成。树脂材料，周边具有第一区域和第二区域，第一区域中的绝缘层具有覆盖有保护膜的开口，密封材料形成为与开口和保护膜接触，外边缘部分第二区域中的绝缘层覆盖有保护膜或密封材料。


FIG. 1