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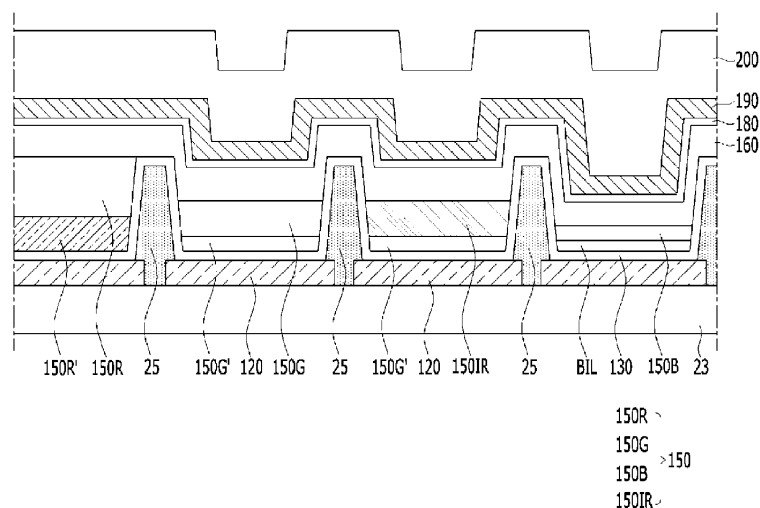
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(54) **LIGHT EMITTING DISPLAY DEVICE**

(57) A light emitting display device includes a substrate (23) having a first pixel, a second pixel, a third pixel, and an infrared emission portion. The first, second, and third pixels emit light of different colors. The light emitting device also includes a first electrode (120) on the substrate, a second electrode (190) overlapping the first electrode, an emission layer (150) between the first elec-

trode and the second electrode, and an auxiliary layer (150R', 150G', BIL) between the first electrode and the emission layer. The auxiliary layer includes a first auxiliary layer on the first pixel and a second auxiliary layer in the infrared emission portion. The first auxiliary layer and second auxiliary layer include a same material.

FIG. 2





EUROPEAN SEARCH REPORT

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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	WO 2015/192649 A1 (TRULY HUIZHOU SMART DISPLAY LTD [CN]) 23 December 2015 (2015-12-23) * figures 2-5 *	9-11,13	INV. H01L51/52 H01L27/32
Y		12,14,15	
A		1	
X,P	& US 2017/123542 A1 (XIE ZHISHENG [CN] ET AL) 4 May 2017 (2017-05-04) * paragraph [0066] - paragraph [0074]; figures 2-5 *	9-11,13	

X	US 2015/243712 A1 (WANG SEONG-MIN [KR] ET AL) 27 August 2015 (2015-08-27) * paragraph [0106] - paragraph [0111] * * paragraph [0146] - paragraph [0151] *	1-4,7,8	

X	US 2015/364527 A1 (WANG SEONG MIN [KR] ET AL) 17 December 2015 (2015-12-17)	9	
Y	* paragraph [0044] - paragraph [0046]; figures 1,2 * * paragraph [0051] - paragraph [0052] * * paragraph [0074] * * paragraph [0070] *	12,14,15	

			TECHNICAL FIELDS SEARCHED (IPC)
			H01L G09G G02F G06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 October 2018	Examiner Beierlein, Udo
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 03/02 (P04C01)



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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
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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: 1-8

An auxiliary layer, solving the problem of enhancing the efficiency of the emission layers.

2. claims: 9-15

An infrared receiving portion, solving the problem of determining the presence of an object, proximity, movement, etc.

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

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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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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2015192649 A1	23-12-2015	CN 104009067 A	27-08-2014
		US 2017123542 A1	04-05-2017
		WO 2015192649 A1	23-12-2015

US 2015243712 A1	27-08-2015	CN 104867957 A	26-08-2015
		JP 2015162463 A	07-09-2015
		KR 20150101509 A	04-09-2015
		US 2015243712 A1	27-08-2015

US 2015364527 A1	17-12-2015	CN 105304673 A	03-02-2016
		KR 20150142816 A	23-12-2015
		US 2015364527 A1	17-12-2015

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

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优先权	1020170029513 2017-03-08 KR		
其他公开文献	EP3373355A2		
外部链接	Espacenet		

摘要(译)

一种发光显示装置，包括具有第一像素，第二像素，第三像素和红外发射部分的基板（23）。第一，第二和第三像素发射不同颜色的光。发光器件还包括在基板上的第一电极（120），与第一电极重叠的第二电极（190），在第一电极和第二电极之间的发光层（150），以及辅助层（150R'）。第一电极和发光层之间的150G'，BIL）。辅助层包括第一像素上的第一辅助层和红外发射部分中的第二辅助层。第一辅助层和第二辅助层包括相同的材料。

