

SUPPLEMENTARY PARTIAL EUROPEAN SEARCH REPORT

under Rule 62a and/or 63 of the European Patent Convention.
This report shall be considered, for the purposes of
subsequent proceedings, as the European search report

Application Number

EP 15 81 5759

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 2014/049531 A1 (KWAK SANG HYEON [KR]) 20 February 2014 (2014-02-20)	1-3,5-8, 10,11	INV. G09G3/3233
Y	* paragraph [0026] - paragraph [0099]; figures 1-9 *	12	
X	US 2005/237283 A1 (OZAWA TOKURO [JP] ET AL) 27 October 2005 (2005-10-27)	1,4,6,7, 9	
Y	* paragraph [0036] - paragraph [0091]; figures 1-7 *	12	
			TECHNICAL FIELDS SEARCHED (IPC)
			G09G
The supplementary search report has been based on the last set of claims valid and available at the start of the search.			
INCOMPLETE SEARCH			
The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.			
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		9 May 2018	Harke, Michael
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			

Claim(s) completely searchable:
1-12

Claim(s) not searched:
13-15

Reason for the limitation of the search:

1. The present claims 1 and 13 do not to meet the requirements of Rule 43(2) EPC.

1.1. The two independent device claims 1 and 13 do neither involve alternative solutions to a particular problem nor define interrelated products, so that one single independent device claim appears to be appropriate.

2. The search has been restricted to the subject-matter indicated by the applicant in his letter of 14 December 2017 filed in reply to the invitation pursuant to Rule 62a(1) EPC, i.e. independent claim 1 and claims 2 to 12 making reference to claim 1.

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).

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: 1-11

The first invention concerns an OLED display device as claimed in claim 1, i.e. an OLED display device in which when an Nth row unit pixel is in a sampling period or a programming period, at least one row unit pixel of a previous row unit pixel or a next row unit pixel adjacent to the Nth row unit pixel is in any one of a holding period from after completion of writing of a data voltage (Vdata) to each of the at least one row unit pixel to before each of the at least one row unit pixel emits a light, a first initialization period in which a voltage of an anode of an OLED (OLED) included in each of the at least one row unit pixel has a lower value than an OLED driving voltage, and a second initialization period in which a voltage difference between a gate node (N1) and a source node (N2) of a driving element (DT) that regulates an OLED driving voltage applied to an OLED (OLED) included in each of the at least one row unit pixel has a higher value than a threshold voltage of the driving element (DT), or in the first initialization period and the second initialization period, wherein, as claimed in claim 4, in the Nth row unit pixel, the second initialization period starts earlier than the first initialization period.

2. claim: 12

The second invention concerns an OLED display device as claimed in claim 1 (see the first invention for further details), wherein, as claimed in claim 12, the OLED (OLED) is a light emitting element and each of a plurality of pixels includes a pixel driving circuit that drives the light emitting element, and the pixel driving circuit includes: the driving element (DT) connected in series between a high-potential voltage supply line and a low-potential voltage supply line, together with the light emitting element; a first switching element (T1) that connects a data line with the gate node (N1) connected with a gate of the driving element (DT) in response to a first scan signal (SCAN1); a second switching element (T2) that connects an initialization voltage supply line with the source node (N2) connected with a source of the driving element (DT) in response to a second scan signal (SCAN2); a third switching element (T3) that connects the high-potential voltage supply line with a drain of the driving element (DT) in response to an emission signal (EM); and a first capacitor (C1) connected between the gate node (N1) and the source node (N2), and the pixel driving circuit operates in a period divided into an initialization period in which when the third switching element (T3) is in an off

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number
EP 15 81 5759

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:

state, the pixel driving circuit turns on the first and second switching elements (T1, T2), to initialize the gate and source nodes (N1, N2), the sampling period in which the pixel driving circuit turns on the first and third switching elements (T1, T3), to sense a threshold voltage of the driving element (DT), the programming period in which when the third switching element (T3) is in an off state, the pixel driving circuit turns on the first switching element (T1), to write a data voltage (Vdata) to the pixel, the holding period from after completion of writing of a data voltage (Vdata) to the pixel to before the pixel emits a light, and an emission period in which the pixel driving circuit turns on the third switching element (T3), to cause the driving element (DT) to supply a drive current to the light emitting element.

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

EP 15 81 5759

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.

09-05-2018

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2014049531	A1	20-02-2014	CN 103594052 A	19-02-2014
			KR 20140023158 A	26-02-2014
			US 2014049531 A1	20-02-2014

US 2005237283	A1	27-10-2005	CN 1691116 A	02-11-2005
			JP 4033166 B2	16-01-2008
			JP 2005309151 A	04-11-2005
			KR 20060043679 A	15-05-2006
			TW 1321772 B	11-03-2010
			US 2005237283 A1	27-10-2005

US 2014184665	A1	03-07-2014	CN 103915061 A	09-07-2014
			DE 102013114348 A1	03-07-2014
			GB 2510481 A	06-08-2014
			KR 20140086467 A	08-07-2014
			US 2014184665 A1	03-07-2014

专利名称(译)	OLED显示器件		
公开(公告)号	EP3166100A4	公开(公告)日	2018-06-27
申请号	EP2015815759	申请日	2015-07-03
[标]申请(专利权)人(译)	乐金显示有限公司		
申请(专利权)人(译)	LG DISPLAY CO. , LTD.		
当前申请(专利权)人(译)	LG DISPLAY CO. , LTD.		
[标]发明人	YOON SANG HUN KANG CHANG HEON LEE JUNG MIN		
发明人	YOON, SANG HUN KANG, CHANG HEON LEE, JUNG MIN		
IPC分类号	G09G3/32		
CPC分类号	G09G3/3291 G09G3/3233 G09G2300/0819 G09G2300/0852 G09G2300/0861 G09G2310/0256 G09G2320/0214 G09G2320/0223		
审查员(译)	HARKE , 米迦勒		
优先权	1020140084053 2014-07-04 KR		
其他公开文献	EP3166100A1		
外部链接	Espacenet		

摘要(译)

提供一种OLED显示装置，包括控制第N行单位像素的电压的电路和与第N行单位像素相邻的像素行的阳极的电压，以使第N行单位像素与像素之间的电压差最小化与第N行单位像素相邻的线，以抑制由引入第N行单位像素的漏电流引起的第N行单位像素的亮度降低。该电路被配置为当第N行单位像素处于采样周期时将第N行单位像素相邻的像素行的阳极的电压设置为等于或低于第N行单位像素的阳极的电压。或者，在OLED显示装置的驱动时序期间的编程时段。因此，可以使由包括在像素之间的阳极中的电压差引起的公共单层朝向低电位阳极的非预期漏电流的流动最小化。高电位阳极和包括低电位阳极的像素。

 SUPPLEMENTARY PARTIAL EUROPEAN SEARCH REPORT		Application Number EP 15 81 5759
under Article 17(2) of the European Patent Convention. This report 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
X	US 2014/049531 A1 (KWAK SANG HYEON [KR]) 29 February 2014 (2014-02-29) paragraph [0026] - paragraph [0099]; figures 1-9	1-3, 5-8, 10, 11, 12
Y		INV: G09G3/3233
X	US 2005/227283 A1 (OZAWA TOKURO [JP] ET AL) 27 October 2005 (2005-10-27) paragraph [0036] - paragraph [0091]; figures 1-7	1, 4, 6, 7, 9
Y	US 2014/184665 A1 (YOON SANG-HUN [KR] ET AL) 3 July 2014 (2014-07-03) paragraph [0035] - paragraph [0067]; figures 1-6	12
The supplementary search report has been based on the last set of claims valid.		
INCOMPLETE SEARCH		
Has the applicant's description been examined in whole or in part? If not, the reasons for this are given in the following table.		
Claims searched completely:		
Claims not searched:		
Reasons for the limitation of the search: see sheet C		
Date of search Munich 9 May 2018		Examiner Harke, Michael
CATEGORY OF CITED DOCUMENTS		
1. Document cited in order to establish the state of the art. 2. Document cited in order to establish the state of the art. 3. Document cited in order to establish the state of the art. 4. Document cited in order to establish the state of the art. 5. Document cited in order to establish the state of the art. 6. Document cited in order to establish the state of the art. 7. Document cited in order to establish the state of the art. 8. Document cited in order to establish the state of the art. 9. Document cited in order to establish the state of the art. 10. Document cited in order to establish the state of the art. 11. Document cited in order to establish the state of the art. 12. Document cited in order to establish the state of the art.		