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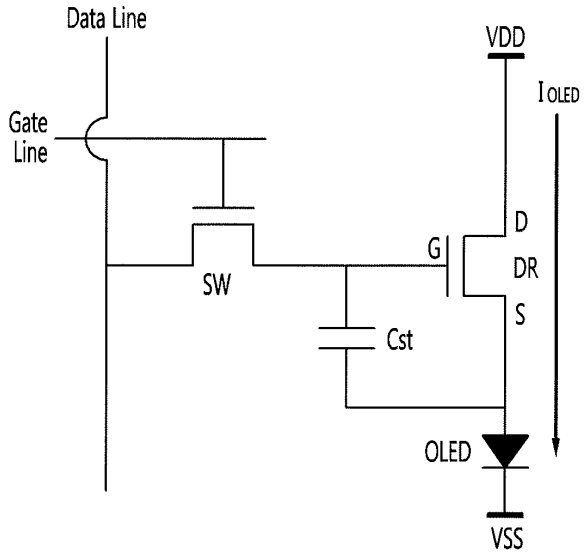
(54) ORGANIC LIGHT EMITTING DIODE DISPLAY DEVICE AND METHOD FOR OPERATING THE SAME

(57) An organic light emitting diode (434) display device (100) includes a display unit (180) including pixels each configured by an organic light emitting diode (434), a power supply unit (190,260) configured to supply power for driving the display unit (180), a discharge unit (300) connected to the display unit (180) and configured to perform a discharge operation (S240) on a display driving voltage applied to the display unit (180), and a discharge control unit (400) configured to control enabling and disabling of the discharge unit (300) based on a power state of the organic light emitting diode (434) display device (100).

FIG. 6



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(Cont. next page)

FIG. 7

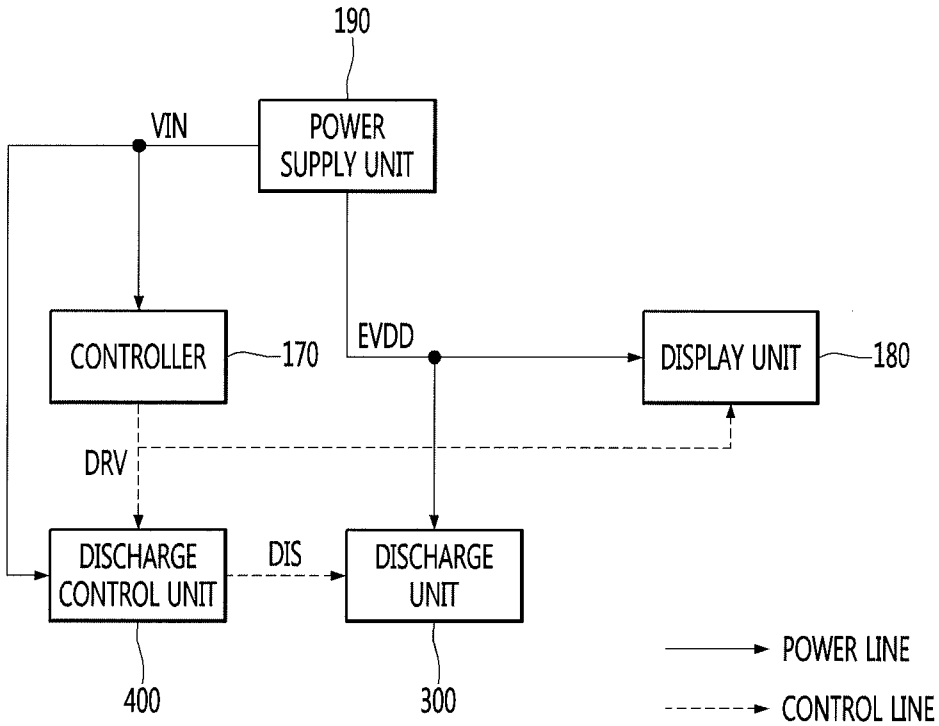
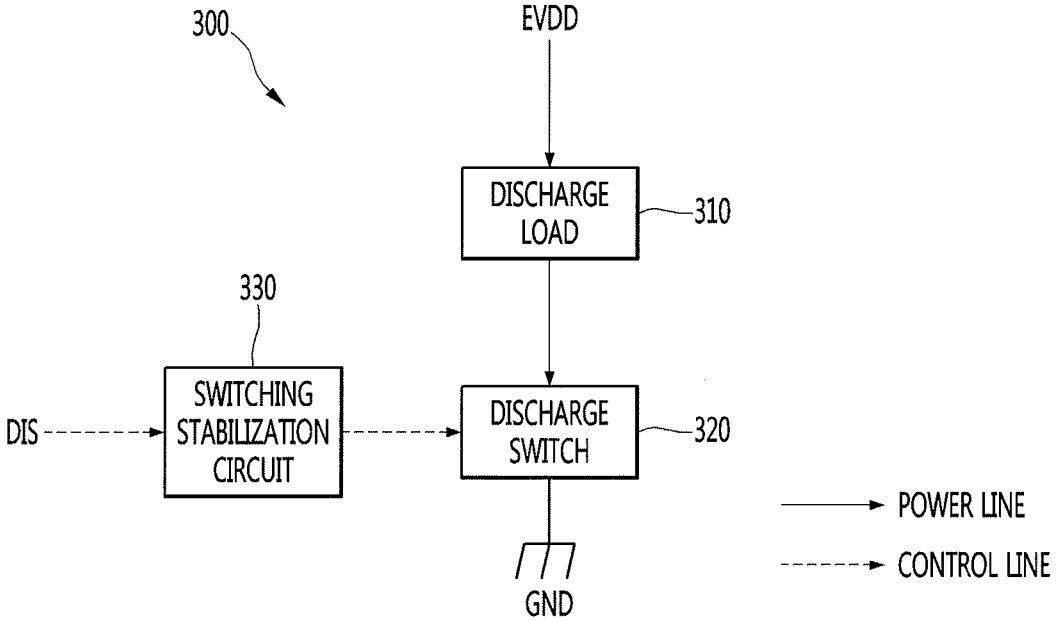

190
VIN
POWER SUPPLY UNIT
CONTROLLER
170
EVDD
DISPLAY UNIT
180
DRV
DISCHARGE CONTROL UNIT
DIS
DISCHARGE UNIT
400
300
POWER LINE
CONTROL LINE

FIG. 8


300
EVDD
DISCHARGE LOAD
310
330
SWITCHING STABILIZATION CIRCUIT
DIS
DISCHARGE SWITCH
320
GND
POWER LINE
CONTROL LINE

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EUROPEAN SEARCH REPORT

Application Number
EP 18 19 6499

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 2016/275859 A1 (TSENG SZUHENG [CN]) 22 September 2016 (2016-09-22)	1,2	INV. G09G3/3233
Y	* paragraphs [0067], [0069]; figure 4 *	3-12,15	
X	EP 3 065 277 A1 (SAMSUNG DISPLAY CO LTD [KR]) 7 September 2016 (2016-09-07)	1,2	
Y	* paragraph [0023]; figures 1-4 *	3-12,15	
Y	US 2008/303775 A1 (GUO WEI [CN] ET AL) 11 December 2008 (2008-12-11) * paragraph [0027]; figure 2 *	3	
Y	US 2014/184482 A1 (ZHANG XIANMING [CN]) 3 July 2014 (2014-07-03) * figures 3, 4 *	3-5,12	

TECHNICAL FIELDS SEARCHED (IPC)

G09G

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

Place of search	Date of completion of the search	Examiner
Munich	13 December 2018	Gundlach, Harald

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 03.82 (P04C01)

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Application Number
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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:

1-12, 15

☐ 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).

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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: 1-12, 15

The technical feature, representing the difference over the non-inventive common matter, of claim 4 is that the discharge control unit comprises a second switch having one end connected between the power supply unit and the first switch, and another end connected to the ground terminal.
This feature provides the technical effect to turn on a switch for a certain time and solves the objective technical problem of how to apply a discharge signal based on a driving signal (see application, par. 173 - 175).
The claims that are not patentable with regard to the prior art at hand, and thus cannot have any special technical features, are sorted to the first invention.

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2. claims: 13, 14

The technical feature, representing the difference over the non-inventive common matter, of claim 14 is that, when a screen size of the display unit is a first size, the discharge load comprises a first number of resistors, and when the screen size of the display unit is a second size larger than the first size, the discharge load comprises a second number of resistors, the second number being larger than the first number..
This feature provides the technical effect to limit the discharge time for large displays and solves the objective technical problem of how to configure the total resistance values with regard to the screen size (see application, par. 167 - 169).

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 19 6499

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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13-12-2018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2016275859 A1	22-09-2016	CN 103943064 A	23-07-2014
		US 2016275859 A1	22-09-2016
		WO 2015135288 A1	17-09-2015
EP 3065277 A1	07-09-2016	CN 105939111 A	14-09-2016
		EP 3065277 A1	07-09-2016
		KR 20160107375 A	19-09-2016
		US 2016260382 A1	08-09-2016
US 2008303775 A1	11-12-2008	CN 101320171 A	10-12-2008
		US 2008303775 A1	11-12-2008
US 2014184482 A1	03-07-2014	NONE	

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)	有机发光二极管显示装置及其操作方法		
公开(公告)号	EP3462438A3	公开(公告)日	2019-04-24
申请号	EP2018196499	申请日	2018-09-25
申请(专利权)人(译)	LG电子株式会社.		
当前申请(专利权)人(译)	LG电子株式会社.		
发明人	SONG, WOOJUNG		
IPC分类号	G09G3/3233		
CPC分类号	G09G3/3208 G09G2330/027 G09G3/3233 G09G2320/0257 G09G3/3258 G09G2310/0264		
审查员(译)	GUNDLACH，HARALD		
优先权	1020170127703 2017-09-29 KR		
其他公开文献	EP3462438A2		
外部链接	Espacenet		

摘要(译)

有机发光二极管（434）显示装置（100）包括：显示单元（180），包括各自由有机发光二极管（434）构成的像素;电源单元（190,260），被配置为供应用于驱动显示单元的电源（180），放电单元（300），其连接到显示单元（180）并且被配置为对施加到显示单元（180）的显示驱动电压执行放电操作（S240），以及放电控制单元（400）被配置为基于有机发光二极管（434）显示装置（100）的电源状态来控制放电单元（300）的启用和禁用。

FIG. 6