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Alexandria, Virginia 22313-1450
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/973,758	08/02/2016	9406733	48842-US-PA-1	3878

31561 7590 07/13/2016
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Yi-Hsuan Lee, Taipei City, TAIWAN;
Au Optonics Corporation, Hsinchu, TAIWAN;
Peng-Bo Xi, Taipei City, TAIWAN;
Wei-Chu Hsu, Taipei City, TAIWAN;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

Document Description: Issue Fee Payment (PTO-85B)

Issue Fee Transmittal Form

Application Number	Filing Date	First Named Inventor	Atty. Docket No.	Confirmation No.
14973758	18-Dec-2015	Yi-Hsuan Lee	48842-US-PA-1	3878

TITLE OF INVENTION :

PIXEL STRUCTURE

Entity Status	Application Type	Art Unit	Class - Subclass	EXAMINER
Regular Undiscounted	Utility under 35 USC 111(a)	2822	040000	IDA SOWARD
Issue Fee Due	Publication Due	Total Fee(s) Due	Date Due	Prev. Paid Fee
\$960	\$0	\$960	19-Jul-2016	\$0

1.Change of Correspondence Address and/or Indication Of Fee Address (37 CFR 1.33 & 1.363)

Current Correspondence Address:	Current Indicated Fee Address :
31561 JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE 7 FLOOR-1, NO. 100 ROOSEVELT ROAD, SECTION 2 TAIPEI 100 TAIWAN 8775045885,EXT 1 ~~Belinda@JCIPGROUP.COM.TW~~	
☐ Change of correspondence address requested, system generated AIA/122-EFS form attached	☐ Fee Address indication requested, system generated SB/47-EFS form attached

2.Entity Status

Change in Entity Status

- Applicant certifying micro entity status; system generated Micro Entity certification form attached. See 37 CFR 1.29.
Note: Absent a valid certification of micro entity status, issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
☐ If this box is checked, you will be prompted to choose a micro entity status on the gross income basis (37 CFR 1.29(a)) or the institution of higher education basis (37 CFR 1.29(d)), and make the applicable certification online.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27.
Note: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☒ Applicant changing to regular undiscounted fee status.
Note: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

Document Description: Issue Fee Payment (PTO-85B)

3.The Following Fee(s) Are Submitted:

☒ Issue Fee

☐ I authorize USPTO to apply my previously paid issue fee to the current fees due

☐ Publication Fee

☐ The Director is hereby authorized to apply my previously paid issue fee to the current fee due and to charge deficient fees to Deposit Account Number _____

☐ Advance Order - # of copies _____

☒

If in **addition** to the payment of the issue fee amount submitted with this form, there are any discrepancies in any amount(s) due, the Director is authorized to charge any deficiency, or credit any overpayment, to Deposit Account Number 502620 .
The **issue fee must be submitted** with this form. **If payment of the issue fee does not accompany this form, checking this box and providing a deposit account number will NOT be effective to satisfy full payment of the fee(s) due.**

4.Firm and/or Attorney Names To Be Printed

NOTE: If no name is listed, no name will be printed
For printing on the patent front page, list to be displayed as entered

1. Jianq Chyun IP Office
2.
3.

5.Assignee Name(s) and Residence Data To Be Printed

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

Name	City	State	Country	Category
Au Optronics Corporation	Hsinchu		taiwan	corporation

6.Signature

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application. I also certify that this Fee(s) Transmittal form is being transmitted to the USPTO via EFS-WEB on the date indicated below.

Signature	/Belinda Lee/	Date	06-22-2016
Name	Belinda Lee	Registration Number	46863

Electronic Patent Application Fee Transmittal				
Application Number:		14973758		
Filing Date:		18-Dec-2015		
Title of Invention:		PIXEL STRUCTURE		
First Named Inventor/Applicant Name:		Yi-Hsuan Lee		
Filer:		Belinda Lee		
Attorney Docket Number:		48842-US-PA-1		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility Appl Issue Fee	1501	1	960	960
Publ. Fee- Early, Voluntary, or Normal	1504	1	0	0
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				960

Electronic Acknowledgement Receipt	
EFS ID:	26134930
Application Number:	14973758
International Application Number:	
Confirmation Number:	3878
Title of Invention:	PIXEL STRUCTURE
First Named Inventor/Applicant Name:	Yi-Hsuan Lee
Customer Number:	31561
Filer:	Belinda Lee
Filer Authorized By:	
Attorney Docket Number:	48842-US-PA-1
Receipt Date:	27-JUN-2016
Filing Date:	18-DEC-2015
Time Stamp:	04:10:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 960
RAM confirmation Number	062716INTEFSW00007251502620
Deposit Account	502620
Authorized User	Belinda Lee
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	Web85b.pdf	46100	no	2
			11439150cca2ace7f06c33848457ddb417c9835		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32076	no	2
			37a34ccdc23812ea93fd12e42b8e8bff30aa51e0		
Warnings:					
Information:					
Total Files Size (in bytes):			78176		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					



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NOTICE OF ALLOWANCE AND FEE(S) DUE

31561 7590 04/19/2016
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

SOWARD, IDA M

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 04/19/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/973,758	12/18/2015	Yi-Hsuan Lee	48842-US-PA-1	3878

TITLE OF INVENTION: PIXEL STRUCTURE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	07/19/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or **Fax** (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

31561 7590 04/19/2016
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/973,758	12/18/2015	Yi-Hsuan Lee	48842-US-PA-1	3878

TITLE OF INVENTION: PIXEL STRUCTURE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	07/19/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
SOWARD, IDA M	2822	257-040000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/973,758	12/18/2015	Yi-Hsuan Lee	48842-US-PA-1	3878

31561 7590 04/19/2016
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

SOWARD, IDA M

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 04/19/2016

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/973,758	Applicant(s) LEE ET AL.	
	Examiner IDA M. SOWARD	Art Unit 2822	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the application filed December 18, 2015.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-5. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
Certified copies:
a) ☒ All b) ☐ Some *c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)	5. ☐ Examiner's Amendment/Comment
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____	6. ☒ Examiner's Statement of Reasons for Allowance
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	7. ☐ Other _____
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____	

/IDA M SOWARD/ Primary Examiner, Art Unit 2822	
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The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

DETAILED ACTION

This Office Action is in response to the application filed December 18, 2015.

Priority

Receipt is acknowledged of certified copies of papers required by 37 CFR 1.55.

Allowable Subject Matter

Claims 1-5 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art of record does not disclose, make obvious, or otherwise suggest the structure of the applicant's together with the other limitations of the independent claims, such as "a data line and a scan line; at least one active device electrically connected with the data line and the scan line; a light emitting device electrically connected with the active device, wherein the light emitting device comprises: a first electrode layer; a light emitting layer disposed on the first electrode layer; and a second electrode layer disposed on the light emitting layer, wherein the second electrode layer is electrically connected with the active device; and an auxiliary electrode electrically insulated from the active device and

disposed at a side of the light emitting device, wherein the auxiliary electrode is electrically connected with the first electrode layer of the light emitting device”.

The dependent claims being further limiting and definite are also allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to pixel structures:

Bang et al. (US 8,318,521 B2)	Im et al. (US 2010/0148163 A1)
Kim (US 7,919,918 B2)	Kimura et al. (US 2012/0194412 A1)
Koo et al. (US 2006/0027838 A1)	Koo et al. (US 2006/0267491 A1)
Kwak (US 2005/0179374 A1)	Park et al. (Us 2010/0026167 A1)
Suh et al. (US 7,855,503 B2)	Yamazaki et al. (US 9,224,870 B2)
Yoshida (US 2008/0158137 A1)	Yoshida et al. (US 2007/0001945 A1).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IDA M. SOWARD whose telephone number is (571)272-

1845. The examiner can normally be reached on Monday - Thursday 6:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brett A. Feeney can be reached on 571-270-5484. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

IMS
April 5, 2016
/IDA M SOWARD/
Primary Examiner, Art Unit 2822

Notice of References Cited	Application/Control No. 14/973,758	Applicant(s)/Patent Under Reexamination LEE ET AL.	
	Examiner IDA M. SOWARD	Art Unit 2822	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-8,318,521 B2	11-2012	Bang; Hyun-Chol	H01L51/5234	257/E21.414
*	B	US-2010/0148163 A1	06-2010	Im; Ki-Ju	G06F3/0412	257/40
*	C	US-7,919,918 B2	04-2011	Kim; Eun-Ah	H01L27/3244	313/506
*	D	US-2012/0194412 A1	08-2012	Kimura; Hajime	G09G3/3241	345/76
*	E	US-2006/0027838 A1	02-2006	Koo; Jae-Bon	H01L27/3262	257/257
*	F	US-2006/0267491 A1	11-2006	Koo; Jae-Bon	H01L27/3276	313/511
*	G	US-2005/0179374 A1	08-2005	Kwak, Won-Kyu	H01L27/3276	313/506
*	H	US-2010/0026167 A1	02-2010	Park; Jaeyong	H01L27/3253	313/504
*	I	US-7,855,503 B2	12-2010	Suh; Min-Chul	G02F1/136286	257/72
*	J	US-9,224,870 B2	12-2015	Yamazaki; Shunpei	H01L27/1214	1/1
*	K	US-2008/0158137 A1	07-2008	Yoshida; Yasunori	G09G3/3413	345/102
*	L	US-2007/0001945 A1	01-2007	YOSHIDA; Yasunori	G09G3/3233	345/87
*	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
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	P					
	Q					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



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BIB DATA SHEET

CONFIRMATION NO. 3878

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.		
14/973,758	12/18/2015	257	2822	48842-US-PA-1		
APPLICANTS Au Optronics Corporation, Hsinchu, TAIWAN; INVENTORS Yi-Hsuan Lee, Taipei City, TAIWAN; Peng-Bo Xi, Taipei City, TAIWAN; Wei-Chu Hsu, Taipei City, TAIWAN; ** CONTINUING DATA ***** This application is a DIV of 14/447,620 07/31/2014 PAT 9263509 ** FOREIGN APPLICATIONS ***** TAIWAN 102133040 09/12/2013 ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 01/04/2016						
Foreign Priority claimed ☒ Yes ☐ No 35 USC 119(a-d) conditions met ☒ Yes ☐ No Verified and Acknowledged <u>/IDA M SOWARD/</u> Examiner's Signature		☐ Met after Allowance IMS Initials	STATE OR COUNTRY TAIWAN	SHEETS DRAWINGS 4	TOTAL CLAIMS 5	INDEPENDENT CLAIMS 1
ADDRESS JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE 7 FLOOR-1, NO. 100 ROOSEVELT ROAD, SECTION 2 TAIPEI, 100 TAIWAN						
TITLE PIXEL STRUCTURE						
FILING FEE RECEIVED 1600	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	3198	au-optronics-corporation.as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/05 16:06
S2	26	lee-yi-hsuan.inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/05 16:07
S3	34	xi-peng-bo.inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/05 16:07
S4	8	hsu-wei-chu.inv.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/05 16:07
S5	8984	(H01L27/3246).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/05 16:08
S6	4231	(H01L27/3248).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/05 16:08
S7	2609	(H01L51/5212).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/05 16:08
S8	5547	(H01L51/5221).CPC.	US-PGPUB;	OR	ON	2016/04/05

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			16:08
S9	170	(data adj line) and (scan adj line) and (light adj emitting) and (auxiliary adj electrode) and ((first or lower\$4 or bottom\$4) adj electrode) and ((second or upper\$4 or top\$4) adj electrode)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/05 16:30
S10	40	("7432885" "20130082270" "8482010" "8664662" "20130187135" "20050179374" "20070063936" "20130082270" "8878226" "20100026167" "8482010" "20080158137" "7279714" "20140022230" "20120074423" "8062695" "20080018245" "7821198" "8664662" "7919918" "20130187135" "20120074423").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/05 17:06
S11	185	(data adj line) and (scan adj line) and (light adj emitting) and (auxiliary adj electrode) and (anode) and (cathode)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/04/05 17:23

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S13	183	(data adj line) and (scan adj line) and (light adj emitting) and (auxiliary adj electrode) and (anode) and (cathode)	US-PGPUB; USPAT	OR	ON	2016/04/05 17:27
S14	169	(data adj line) and (scan adj line) and (light adj emitting) and (auxiliary adj electrode) and ((first or lower\$4 or bottom\$4) adj electrode) and ((second or upper\$4 or top\$4) adj electrode)	US-PGPUB; USPAT	OR	ON	2016/04/05 17:27

4/ 5/ 2016 6:02:37 PM**C:\Users\isoward\Documents\EAST\Workspaces\14973758.wsp**

<i>Index of Claims</i> 	Application/Control No. 14973758	Applicant(s)/Patent Under Reexamination LEE ET AL.
	Examiner IDA M SOWARD	Art Unit 2822

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant										☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM			DATE												
Final	Original	04/05/2016													
	1	=													
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Search Notes 	Application/Control No. 14973758	Applicant(s)/Patent Under Reexamination LEE ET AL.
	Examiner IDA M SOWARD	Art Unit 2822

CPC- SEARCHED		
Symbol	Date	Examiner
H01L 27/3246, 3248; 51/5212, 5221	4/5/2016	IMS

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST (See Search History Printout), PLUS Search	4/5/2016	IMS

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	See Interference Search Printout	4/5/2016	IMS

	/IDA M SOWARD/ Primary Examiner.Art Unit 2822
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/973,758	12/18/2015	Yi-Hsuan Lee	48842-US-PA-1

CONFIRMATION NO. 3878

PUBLICATION NOTICE

31561
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN



OC000000082190061

Title:PIXEL STRUCTURE

Publication No.US-2016-0104753-A1

Publication Date:04/14/2016

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The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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PLUS Search Results for S/N 14973758, Searched Thu Mar 31 09:24:05 EDT 2016
 The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO.	TOT CLAIMS	IND CLAIMS
14/973,758	12/18/2015	2811	1600	48842-US-PA-1	5	1

CONFIRMATION NO. 3878

FILING RECEIPT



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31561
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

Date Mailed: 01/06/2016

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Inventor(s)

Yi-Hsuan Lee, Taipei City, TAIWAN;
Peng-Bo Xi, Taipei City, TAIWAN;
Wei-Chu Hsu, Taipei City, TAIWAN;

Applicant(s)

Au Optronics Corporation, Hsinchu, TAIWAN;

Power of Attorney: The patent practitioners associated with Customer Number 31561

Domestic Priority data as claimed by applicant

This application is a DIV of 14/447,620 07/31/2014

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TAIWAN 102133040 09/12/2013

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/973,758**

Projected Publication Date: 04/14/2016

Non-Publication Request: No

Early Publication Request: No
Title

PIXEL STRUCTURE

Preliminary Class

257

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 14/973,758	
APPLICATION AS FILED - PART I						
(Column 1)		(Column 2)		SMALL ENTITY		OR
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)	OTHER THAN SMALL ENTITY	
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A		N/A	280
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A		N/A	600
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A		N/A	720
TOTAL CLAIMS (37 CFR 1.16(j))	5	minus 20 = *			x 80 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1	minus 3 = *			x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).					0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))						0.00
			TOTAL		TOTAL	1600
* If the difference in column 1 is less than zero, enter "0" in column 2.						
APPLICATION AS AMENDED - PART II						
AMENDMENT A	(Column 1)		(Column 2)		(Column 3)	
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	SMALL ENTITY		OR
	Total (37 CFR 1.16(j))	*	Minus **	RATE(\$)	ADDITIONAL FEE(\$)	OTHER THAN SMALL ENTITY
	Independent (37 CFR 1.16(h))	*	Minus ***	x	=	OR
	Application Size Fee (37 CFR 1.16(s))			x	=	OR
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR
			TOTAL ADD'L FEE		TOTAL ADD'L FEE	
AMENDMENT B	(Column 1)		(Column 2)		(Column 3)	
	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	SMALL ENTITY		OR
	Total (37 CFR 1.16(j))	*	Minus **	RATE(\$)	ADDITIONAL FEE(\$)	OTHER THAN SMALL ENTITY
	Independent (37 CFR 1.16(h))	*	Minus ***	x	=	OR
	Application Size Fee (37 CFR 1.16(s))			x	=	OR
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					OR
			TOTAL ADD'L FEE		TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.						

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31561

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Name Registration	Number	Name Registration	Number

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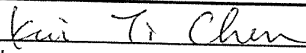
AU Optronics Corp.

No.1, Li-Hsin Road 2, Science-Based Industrial Park, Hsin-Chu, Taiwan, R.O.C.

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SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	2012.9.17
Name	Kai-Ti Chen	Telephone	+886-3-5008800
Title	Senior Manager		

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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Au Optronics Corporation

Application No./Patent No.: _____ Filed/Issue Date: _____

Titled: PIXEL STRUCTURE

Au Optronics Corporation, a corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is _____. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

- A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 033451, Frame 0704, or for which a copy thereof is attached.

- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

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[Page 1 of 2]

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☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Belinda Lee/

2015-12-16

Signature

Date

Belinda Lee

46863

Printed or Typed Name

Title or Registration Number

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Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		PIXEL STRUCTURE		
First Named Inventor/Applicant Name:		Yi-Hsuan Lee		
Filer:		Belinda Lee		
Attorney Docket Number:		48842-US-PA-1		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1600

Electronic Acknowledgement Receipt	
EFS ID:	24374258
Application Number:	14973758
International Application Number:	
Confirmation Number:	3878
Title of Invention:	PIXEL STRUCTURE
First Named Inventor/Applicant Name:	Yi-Hsuan Lee
Customer Number:	31561
Filer:	Belinda Lee
Filer Authorized By:	
Attorney Docket Number:	48842-US-PA-1
Receipt Date:	18-DEC-2015
Filing Date:	
Time Stamp:	05:33:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

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Payment Type	Credit Card
Payment was successfully received in RAM	\$1600
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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		48842-1usf.pdf	1007797	yes	23
			a491801c762b75d999f9aa8f7797619a60d2e504		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	16	
	Claims		17	18	
	Abstract		19	19	
	Drawings-only black and white line drawings		20	23	
Warnings:					
Information:					
2	Application Data Sheet	48842-1_ADS.pdf	1823191	no	9
			39f3715e998ecf2dd4479bb9a8c89c5e111931ba		
Warnings:					
Information:					
3	Oath or Declaration filed	48842_decl_assign_201408041654.pdf	191951	no	5
			7bcc5bd3e0ebc759148f395f439f3d9680bbe1ce4		
Warnings:					
Information:					
4	Power of Attorney	48842-1_poa.pdf	114438	no	1
			3721ffeb71e45d02e454c493918cf46e29e1e24f		
Warnings:					
Information:					
5	Assignee showing of ownership per 37 CFR 3.73	48842-1_statement.pdf	134612	no	3
			04ebcd8409793ca19cb25520dd39f2af0b3c2851		
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6	Fee Worksheet (SB06)	fee-info.pdf	34635 1d0e22c4b59b085c0a890af7ec81ca29f48f9cfe	no	2
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PIXEL STRUCTURE

CROSS-REFERENCE TO RELATED APPLICATION

5 This application is a divisional application of U.S. application serial no. 14/447,620, filed on July 31, 2014, now allowed. The prior U.S. application serial no. 14/447,620 claims the priority benefit of Taiwan application serial no. 102133040, filed on September 12, 2013. The entirety of each of the above-mentioned patent applications is hereby incorporated by reference herein and made a part of this specification.

10

BACKGROUND OF THE INVENTION

[Field of the Invention]

[0001] The invention relates to a pixel structure and particularly relates to a pixel structure capable of improving the overall luminous uniformity of a display panel.

15 [Description of Related Art]

[0002] An electroluminescent device is a self-emissive device, which has the following characteristics: no limit to the viewing angle, low production cost, high response speed (about hundred times faster than liquid crystal), power saving, suitable for DC driven portable machines, large working temperature range, light weight, 20 suitable for being miniaturized/thinned depending on the hardware equipment, and so on. Therefore, electroluminescent devices have great potential and may very likely become the next-generation flat panel display.

[0003] At present, top emission display is one of the display technologies that are

extensively applied to electroluminescent devices for improving the pixel aperture ratio. However, the traditional top emission display technology still faces problems, such as difficulty in fabricating thin electrodes, low transmittance, high electrode resistance, and serious IR drop that occurs on large-sized electroluminescent devices. In addition, according to the traditional circuit design of top emission display technology, the current may be easily affected by decline of elements of the electroluminescent devices. Since the luminance of each pixel of the electroluminescent device is related to the current that flows through the pixel, the overall luminous uniformity of the electroluminescent device is low.

10

SUMMARY OF THE INVENTION

[0004] The invention provides a pixel structure for solving the problem of poor overall luminous uniformity that occurs on the traditional electroluminescent device.

[0005] The invention provides a pixel structure, which includes a data line, a scan line,

15 at least one active device, a first auxiliary electrode, and a light emitting device. The at least one active device is electrically connected with the data line and the scan line. Each active device includes a gate, a channel layer, a source, and a drain. The first auxiliary electrode is electrically insulated from the active device. The light emitting device is disposed above the first auxiliary electrode, wherein the light emitting device includes a first electrode layer, a light emitting layer, and a second electrode layer. The first electrode layer is electrically connected with the first auxiliary electrode. The light emitting layer is disposed on the first electrode layer. The second electrode layer is disposed on the light emitting layer, wherein the second electrode layer is electrically

20

connected with the active device.

[0006] The invention further provides a pixel structure, which includes a data line, a scan line, at least one active device, a light emitting device, and an auxiliary electrode.

The at least one active device is electrically connected with the data line and the scan

5 line. The light emitting device is electrically connected with the active device, wherein the light emitting device includes a first electrode layer, a light emitting layer, and a second electrode layer. The light emitting layer is disposed on the first electrode layer.

The second electrode layer is disposed on the light emitting layer, wherein the second electrode layer is electrically connected with the active device. The auxiliary electrode

10 is electrically insulated from the active device and located at a side of the light emitting device, wherein the auxiliary electrode is electrically connected with the first electrode layer of the light emitting device.

[0007] Based on the above, in the pixel structure of the invention, the first electrode layer of the light emitting device is electrically connected with the auxiliary electrode.

15 Therefore, the design of the invention that coordinates the first electrode layer of the light emitting device with the auxiliary electrode decreases the resistance of the first electrode layer through parallel connection, so as to significantly reduce the total resistance of the pixel structure, thereby improving the overall luminous uniformity of the display panel.

20 [0008] To make the aforementioned and other features and advantages of the invention more comprehensible, several embodiments accompanied with drawings are described in detail as follows.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The accompanying drawings are included to provide a further understanding of the invention, and are incorporated in and constitute a part of this specification. The drawings illustrate exemplary embodiments of the invention and, together with the
5 description, serve to explain the principles of the invention.

[0010] FIG. 1 is an equivalent circuit diagram of a pixel structure of the invention.

[0011] FIG. 2 is a schematic cross-sectional view of a pixel structure according to the first embodiment of the invention.

[0012] FIG. 3 is a schematic cross-sectional view of a pixel structure according to the
10 second embodiment of the invention.

[0013] FIG. 4 is a schematic cross-sectional view of a pixel structure according to the third embodiment of the invention.

[0014] FIG. 5 is a schematic cross-sectional view of a pixel structure according to the fourth embodiment of the invention.

15 [0015] FIG. 6 is a schematic cross-sectional view of a pixel structure according to the fifth embodiment of the invention.

DESCRIPTION OF THE EMBODIMENTS

[0016] FIG. 1 is an equivalent circuit diagram of a pixel structure of the invention.
20 The pixel structure of the invention is applicable to a pixel array of an electroluminescent device, for example. In the following descriptions, one single pixel structure is exemplified to explain in detail the design of the pixel structure of the invention. It should be clear to those having ordinary knowledge in the art that the

pixel array of the electroluminescent device is composed of a plurality of identical or similar pixel structures. Therefore, based on the following descriptions of one single pixel structure, those having ordinary knowledge in the art would be able to understand the structure or layout of the pixel array in the electroluminescent device.

5 [0017] With reference to FIG. 1, a pixel structure 100 includes a data line DL, a scan line SL, at least one active device T₁ and T₂, a capacitor CS, a power line PL, and a light emitting device 130. In this embodiment, each pixel structure 100 for example has two active devices coordinated with one capacitor (2T1C); however, the invention is not limited thereto. This disclosure is not intended to limit the number of the active
10 devices and the number of the capacitors in each pixel structure 100 of the invention.

[0018] In this embodiment, the active device T₁ is electrically connected with the data line DL and the scan line SL. The active device T₂ is electrically connected with the active device T₁ and the light emitting device 130. The light emitting device 130 is electrically connected with the active device T₂ and the power line PL. Moreover, the
15 capacitor CS is electrically connected with the active devices T₁ and T₂.

[0019] To be more specific, in the pixel structure with 2T1C, the active device T₁ includes a gate G₁, a source S₁, a drain D₁, and a channel layer CH₁. The source S₁ is electrically connected with the data line DL. The gate G₁ is electrically connected with the scan line SL. The drain D₁ is electrically connected with the active device T₂.
20 The active device T₂ includes a gate G₂, a source S₂, a drain D₂, and a channel layer CH₂. The gate G₂ of the active device T₂ is electrically connected with the drain D₁ of the active devices T₁. The drain D₂ of the active device T₂ is electrically connected with the light emitting device 130. Moreover, the light emitting device 130 is electrically

connected with the drain D_2 of the active device T_2 and the power line PL. An electrode end E_1 of the capacitor CS is electrically connected with the drain D_1 of the active device T_1 and the gate G_2 of the active device T_2 . The other electrode end E_2 of the capacitor CS is electrically connected with the source S_2 of the active device T_2 and
5 connected to a ground voltage.

[0020] FIG. 2 is a schematic cross-sectional view of a pixel structure according to the first embodiment of the invention. In order to clearly illustrate this embodiment of the invention, FIG. 2 depicts only a part of the components, such as the active device T_2 and the light emitting device 130 of the pixel structure 100. That is to say, for illustrative
10 purpose, the data line DL, the scan line SL, the active device T_1 , the capacitor CS, the power line PL, and so on are omitted from FIG. 2. Since structures of these omitted components are commonly known to those having ordinary knowledge in the art, details thereof will not be repeated hereinafter.

[0021] Referring to FIG. 2, the pixel structure 100 includes a substrate 102, the active
15 device T_2 , a first auxiliary electrode 120, a first insulating layer 106, a second insulating layer 108, the light emitting device 103, and a first isolating structure 140.

[0022] A material of the substrate 102 is glass, quartz, an organic polymer, or a metal, etc., for example.

[0023] The active device T_2 includes the gate G_2 , the channel layer CH_2 , the source S_2 ,
20 and the drain D_2 . The channel layer CH_2 is located above the gate G_2 and under the source S_2 and the drain D_2 . In this embodiment, the active device T_2 is a bottom gate thin film transistor, for example, but the invention is not limited thereto. In other embodiments, the active device T_2 can also be a top gate thin film transistor, and a

material of the channel layer CH₂ can be an amorphous thin film or a polycrystalline thin film; however, the invention is not limited thereto. In addition, the gate G₂ of the active device T₂ further has an insulating layer 104 covering thereon, which is also called a gate insulating layer. A material of the insulating layer 104 is an inorganic material, an organic material, or a combination of the foregoing, for example. The inorganic material includes silicon oxide, silicon nitride, silicon oxynitride, or a stack layer of at least two of the foregoing. Moreover, the active device T₂ further includes an etch-stop layer (not shown). The etch-stop layer is disposed on the channel layer CH₂, and the source S₂ and the drain D₂ are disposed on the etch-stop layer. A material of the etch-stop layer includes silicon oxide, silicon nitride, silicon oxynitride, or other suitable materials.

[0024] The first auxiliary electrode 120 is electrically insulated from the active devices T₁ and T₂. The first auxiliary electrode 120 includes a bottom electrode layer 122 and a top electrode layer 124. The bottom electrode layer 122 and the gate G₂ of the active device T₂ belong to the same layer, for example. The top electrode layer 124 and the source S₂ and the drain D₂ of the active device T₂ belong to the same layer, for example. Therefore, the insulating layer 104 is located between the bottom electrode layer 122 and the top electrode layer 124. Furthermore, the insulating layer 104 has a contact window opening 104a that exposes the bottom electrode layer 122. The top electrode layer 124 is filled in the contact window opening 104a, so that the top electrode layer 124 and the bottom electrode layer 122 are electrically connected with each other.

[0025] It is worth mentioning that, because the first auxiliary electrode 120 has the

bottom electrode layer 122 and the top electrode layer 124, the design of the dual-layer auxiliary electrode helps to maintain the flatness of the pixel structure 100.

[0026] The first insulating layer 106 covers the active device T_2 and the first auxiliary electrode 120. A material of the first insulating layer 106 is an inorganic material, an
5 organic material, or a combination of the foregoing, for example. The inorganic material includes silicon oxide, silicon nitride, silicon oxynitride, or a stack layer of at least two of the foregoing. In addition, the first insulating layer 106 has a first contact window opening 106a that exposes the top electrode layer 124 of the first auxiliary electrode 120.

10 [0027] The light emitting device 130 is located above the first auxiliary electrode 120. The light emitting device 130 includes a first electrode layer 132, a light emitting layer 134, and a second electrode layer 136. In this embodiment, the light emitting device 130 is a top-emission organic electroluminescent device, for example. Therefore, the first electrode layer 132 and the second electrode layer 136 serve as an anode and a
15 cathode respectively.

[0028] The first electrode layer 132 of the light emitting device 130 is disposed on the first insulating layer 106. A material of the first electrode layer 132 is aluminum, ITO, or other materials that are suitable as an anode.

[0029] It should be noted that the first electrode layer 132 and the first auxiliary
20 electrode 120 are electrically connected with each other. To be more specific, the first electrode layer 132 of the light emitting device 130 is electrically connected with the top electrode layer 124 of the first auxiliary electrode 120. The first electrode layer 132 is filled in the first contact window opening 106a of the first insulating layer 106, so that

the first electrode layer 132 is electrically connected with the top electrode layer 124 of the first auxiliary electrode 120 via the first contact window opening 106a.

[0030] The second insulating layer 108 covers the first insulating layer 106 and the first electrode layer 132 of the light emitting device 130. A material of the second
5 insulating layer 108 is an inorganic material, an organic material, or a combination of the foregoing, for example. The inorganic material includes silicon oxide, silicon nitride, silicon oxynitride, or a stack layer of at least two of the foregoing. In addition, the second insulating layer 108 has an opening 108a that exposes the first electrode layer 132. Moreover, the first insulating layer 106 and the second insulating layer 108
10 further have a second contact window opening 110 therein, which exposes a portion of the active device T_2 . More specifically, the second contact window opening 110 exposes a portion of the drain D_2 the active device T_2 .

[0031] The light emitting layer 134 of the light emitting device 130 is disposed in the opening 108a of the second insulating layer 108, and the light emitting layer 134 is
15 disposed on the first electrode layer 132. Moreover, a vertical projection of the light emitting layer 134 of the light emitting device 130 at least partially overlaps the first auxiliary electrode 120. The light emitting layer 134 can be an organic light emitting layer or an inorganic light emitting layer. According to the material used by the light emitting layer 134, the electroluminescent device is called an organic electroluminescent
20 device or an inorganic electroluminescent device. In addition, the light emitting layer 134 of the light emitting device 130 of each pixel structure 100 can be a red organic light emitting pattern, a green organic light emitting pattern, a blue organic light emitting pattern, or a light emitting pattern of different colors (e.g. white, orange,

purple,...etc.) generated by mixing light of each spectrum. Besides, according to other embodiments, the light emitting layer 134 of the aforementioned light emitting device 130 can further include an electron input layer, a hole input layer, an electron transmission layer, and a hole transmission layer, etc.

5 [0032] The second electrode layer 136 of the light emitting device 130 is located on the second insulating layer 108 and is filled in the opening 108a of the second insulating layer 108 and disposed on the light emitting layer 134. A material of the second electrode layer 136 is silver, thin silver, or other materials that are suitable as a cathode, for example. The second electrode layer 136 is electrically connected with the active
10 device T₂. More specifically, the second electrode layer 136 is filled in the second contact window opening 110, so that the second electrode layer 136 of the light emitting device 130 is electrically connected with the drain D₂ the active device T₂ via the second contact window opening 110.

[0033] The first isolating structure 140 is located around the second electrode layer
15 136 of the light emitting device 130, wherein a first gap 150 exists between the second electrode layer 136 and the first isolating structure 140. A material of the first isolating structure 140 is a photoresist or other suitable materials, for example. Besides, a shape of the first isolating structure 140 is an inverted triangle, for example. Therefore, a method of forming the first gap 150 includes depositing a second electrode layer
20 material (not shown) on the second insulating layer 108 and the first isolating structure 140, and using the inverted-triangular first isolating structure 140 to break apart the second electrode layer material. As a result, the first gap 150 is formed around a bottom portion of the first isolating structure 140, so as to separate the second electrode

layer 136 and the first isolating structure 140. Moreover, the electrode layer 138 is formed on the first isolating structure 140, and the electrode layer 138 and the second electrode layer 136 belong to the same layer.

[0034] It should be noted that, because the second electrode layer 136 of the light emitting device 130 is formed by the breaking-apart of the inverted-triangular first isolating structure 140, the second electrode layer 136 having a thinner thickness can be formed by a simplified fabrication process, so that the pixel structure 100 has higher transmittance and the second electrode layer 136 has lower resistance, and so on, thereby improving the problem of IR drop.

[0035] Also, it is worth mentioning that, because the first electrode layer 132 and the first auxiliary electrode 120 are electrically connected, the design of the invention, that coordinates the first electrode layer 132 of the light emitting device 130 with the auxiliary electrode, can reduce the resistance of the first electrode layer 132 through parallel connection, so as to reduce the total resistance of the pixel structure 100 by about 40%, thereby improving the overall luminous uniformity of the display panel. For example, the design of coordinating the aforementioned electrode layer with the auxiliary electrode is applicable to the anode of the top-emission organic electroluminescent device, so as to reduce the resistance of the anode through parallel connection. However, the invention is not limited thereto. In other embodiments, the design of coordinating the aforementioned electrode layer with the auxiliary electrode is also applicable to other suitable electrode layers or conductive layers.

[0036] In the embodiment of FIG. 2, the first auxiliary electrode 120 is a dual-layer electrode layer; however, the invention is not limited thereto. In other embodiments of

the invention (as shown in FIG. 3 and FIG. 4), the first auxiliary electrode can also be a single electrode layer. Here, the single electrode layer is not necessarily an electrode layer with one layer, and the single electrode layer may also refer to an electrode layer having a multi-film stack structure.

5 [0037] FIG. 3 and FIG. 4 are schematic cross-sectional views of pixel structures according to the second and third embodiments of the invention. The embodiments of FIG. 3 and FIG. 4 are similar to the embodiment of FIG. 2. The identical or similar components are assigned with the same or similar reference numerals, and detailed descriptions thereof will not be repeated hereinafter.

10 [0038] With reference to FIG. 3, a difference between the embodiment of FIG. 3 and the embodiment of FIG. 2 lies in that, in a pixel structure 200, a first auxiliary electrode 220 merely includes a bottom electrode layer 222, and the bottom electrode layer 222 and the gate G_2 of the active device T_2 belong to the same layer, for example. Therefore, an insulating layer 204 covers the bottom electrode layer 222. Besides, the
15 insulating layer 204 and a first insulating layer 206 further include a first contact window opening 206a that exposes the bottom electrode layer 222. The first electrode layer 132 is filled in the first contact window opening 206a of the insulating layer 204 and the first insulating layer 206, so that the first electrode layer 132 is electrically connected with the bottom electrode layer 222 of the first auxiliary electrode 220 via the
20 first contact window opening 206a.

[0039] With reference to FIG. 4, a difference between the embodiment of FIG. 4 and the embodiment of FIG. 2 lies in that, in a pixel structure 300, a first auxiliary electrode 320 merely includes a top electrode layer 324, and the top electrode layer 324 and the

source S_2 and the drain D_2 of the active device T_2 belong to the same layer, for example. Therefore, the top electrode layer 324 is located above an insulating layer 304. Moreover, a first insulating layer 306 has a first contact window opening 306a that exposes the top electrode layer 324 of the first auxiliary electrode 320. The first
5 electrode layer 132 is filled in the first contact window opening 306a of the first insulating layer 306, so that the first electrode layer 132 is electrically connected with the top electrode layer 324 of the first auxiliary electrode 320 via the first contact window opening 306a.

[0040] FIG. 5 is a schematic cross-sectional view of a pixel structure according to the
10 fourth embodiment of the invention. The embodiment of FIG. 5 is similar to the embodiment of FIG. 2. Therefore, the identical or similar components are assigned with the same or similar reference numerals, and detailed descriptions thereof will not be repeated hereinafter. A difference between the embodiment of FIG. 5 and the embodiment of FIG. 2 is that a pixel structure 400 further includes a second auxiliary
15 electrode 460.

[0041] With reference to FIG. 5, the second auxiliary electrode 460 is electrically insulated from the active device T_2 and located at a side of the light emitting device 130, wherein the second auxiliary electrode 460 is electrically connected with the first electrode layer 132 of the light emitting device 130. To be more specific, a second
20 insulating layer 408 has an opening 408a and a contact window opening 408b that expose the first electrode layer 132. The light emitting layer 134 of the light emitting device 130 is disposed in the opening 408a of the second insulating layer 408. The second auxiliary electrode 460 is filled in the contact window opening 408b of the

second insulating layer 408, so that the second auxiliary electrode 460 is electrically connected with the first electrode layer 132 of the light emitting device 130 via the contact window opening 408b.

[0042] In addition, the second auxiliary electrode 460 and the second electrode layer 136 of the light emitting device 130 belong to the same layer, for example, and the second auxiliary electrode 460 and the second electrode layer 136 of the light emitting device 130 are electrically insulated from each other. More specifically, the pixel structure 400 further includes a second isolating structure 140' that is located at a side of the first isolating structure 140, wherein the second auxiliary electrode 460 is disposed between the first isolating structure 140 and the second isolating structure 140'. A second gap 450 exists between the second auxiliary electrode 460 and the first isolating structure 140, and a second gap 450' exists between the second auxiliary electrode 460 and the second isolating structure 140'. Therefore, the second auxiliary electrode 460 and the first isolating structure 140 are electrically insulated from each other, and the second auxiliary electrode 460 and the second isolating structure 140' are electrically insulated from each other. In addition, the second isolating structure 140' and the first isolating structure 140 belong to the same layer, for example.

[0043] It should be noted that, because a metal that has lower sheet resistance and higher electric conductivity can be used in the second electrode layer 136 of the light emitting device 130 and the second auxiliary electrode 460, the resistance of the second electrode layer 136 can be reduced more effectively to improve the problem of IR drop.

[0044] Also, it is worth mentioning that the first electrode layer 132 is electrically connected with the first auxiliary electrode 120 and the second auxiliary electrode 460.

Therefore, the design of the invention that coordinates the first electrode layer 132 of the light emitting device 130 with two auxiliary electrodes decreases the resistance of the first electrode layer 132 through parallel connection, so as to reduce the total resistance of the pixel structure 400 by about 90%, thereby improving the overall luminous
5 uniformity of the display panel. For example, the design of coordinating the aforementioned electrode layer with two auxiliary electrodes is applicable to the anode of the top-emission organic electroluminescent device, so as to reduce the resistance of the anode through parallel connection. However, the invention is not limited thereto. In other embodiments, the design of coordinating the aforementioned electrode layer
10 with two auxiliary electrodes is also applicable to other suitable electrode layers or conductive layers.

[0045] FIG. 6 is a schematic cross-sectional view of a pixel structure according to the fifth embodiment of the invention. The embodiment of FIG. 6 is similar to the embodiment of FIG. 5. Therefore, the identical or similar components are assigned
15 with the same or similar reference numerals, and detailed descriptions thereof will not be repeated hereinafter. A difference between the embodiment of FIG. 6 and the embodiment of FIG. 5 lies in that a pixel structure 500 merely includes the second auxiliary electrode 460 and does not include the first auxiliary electrode 120.

[0046] With reference to FIG. 6, the second auxiliary electrode 460 is electrically
20 insulated from the active device T_2 and located at a side of the light emitting device 130, wherein the second auxiliary electrode 460 is electrically connected with the first electrode layer 132 of the light emitting device 130. Moreover, an insulating layer 504 covers the gate G_2 of the active device T_2 and the substrate 102. A first insulating

layer 506 covers the active device T_2 and the insulating layer 504. The first electrode layer 132 of the light emitting device 130 is located on the first insulating layer 506.

[0047] In conclusion of the above, in the pixel structure of the invention, the first electrode layer of the light emitting device is electrically connected with the first auxiliary electrode or the second auxiliary electrode or both, wherein the first auxiliary electrode and the gate of the active device belong to the same layer, or the first auxiliary electrode and the source and the drain belong to the same layer, or has the dual-layer electrode structure. Meanwhile, the second auxiliary electrode and the second electrode layer belong to the same layer. Therefore, without increasing the number of masks and production costs, the design of the invention that coordinates the first electrode layer of the light emitting device with the auxiliary electrodes decreases the resistance of the first electrode layer through parallel connection, so as to significantly reduce the total resistance of the pixel structure, thereby improving the overall luminous uniformity of the display panel. In addition, the circuit design of the top emission display technology of the invention also prevents decline of devices of the electroluminescent device from affecting the current.

[0048] It will be apparent to those having ordinary knowledge in the art that various modifications and variations can be made to the disclosed embodiments without departing from the scope or spirit of the invention. In view of the foregoing, it is intended that the invention covers modifications and variations of this disclosure provided that they fall within the scope of the following claims and their equivalents.

WHAT IS CLAIMED IS:

1. A pixel structure, comprising:
 - a data line and a scan line;
 - 5 at least one active device electrically connected with the data line and the scan line;
 - a light emitting device electrically connected with the active device, wherein the light emitting device comprises:
 - a first electrode layer;
 - a light emitting layer disposed on the first electrode layer; and
 - 10 a second electrode layer disposed on the light emitting layer, wherein the second electrode layer is electrically connected with the active device; and
 - an auxiliary electrode electrically insulated from the active device and disposed at a side of the light emitting device, wherein the auxiliary electrode is electrically connected with the first electrode layer of the light emitting device.
- 15 2. The pixel structure according to claim 1, further comprising:
 - a first insulating layer covering the active device, and the first electrode layer of the light emitting device being disposed on the first insulating layer;
 - a second insulating layer covering the first insulating layer and the first electrode layer of the light emitting device, and the second electrode layer of the light emitting
 - 20 device being disposed on the second insulating layer, wherein the second insulating layer has an opening and a first contact window opening that expose the first electrode layer, and the light emitting layer of the light emitting device is disposed in the opening and the auxiliary electrode is electrically connected with the first electrode layer via the

first contact window opening.

3. The pixel structure according to claim 2, wherein the first insulating layer and the second insulating layer further comprise a second contact window opening that exposes a portion of the active device, and the second electrode layer of the light
5 emitting device is electrically connected with the active device via the second contact window opening.

4. The pixel structure according to claim 1, further comprising:

a first isolating structure disposed around the second electrode layer of the light emitting device, wherein a first gap exists between the second electrode layer and the
10 first isolating structure; and

a second isolating structure disposed at a side of the first isolating structure, wherein the auxiliary electrode is disposed between the first isolating structure and the second isolating structure, and the auxiliary electrode is electrically insulated from the first isolating structure and the auxiliary electrode is electrically insulated from the
15 second isolating structure.

5. The pixel structure according to claim 1, wherein the auxiliary electrode and the second electrode layer of the light emitting device belong to the same layer, and the auxiliary electrode is electrically insulated from the second electrode layer of the light emitting device.

20

ABSTRACT OF THE DISCLOSURE

A pixel structure, including a data line, a scan line, at least one active device, a first auxiliary electrode, and a light emitting device, is provided. The at least one active device is electrically connected with the data line and the scan line, and each active
5 device includes a gate, a channel layer, a source, and a drain. The first auxiliary electrode is electrically insulated from the active device. The light emitting device is disposed above the first auxiliary electrode, wherein the light emitting device includes a first electrode layer, a light emitting layer, and a second electrode layer. The first electrode layer is electrically connected with the first auxiliary electrode. The light
10 emitting layer is disposed on the first electrode layer. The second electrode layer is disposed on the light emitting layer, wherein the second electrode layer is electrically connected with the active device.

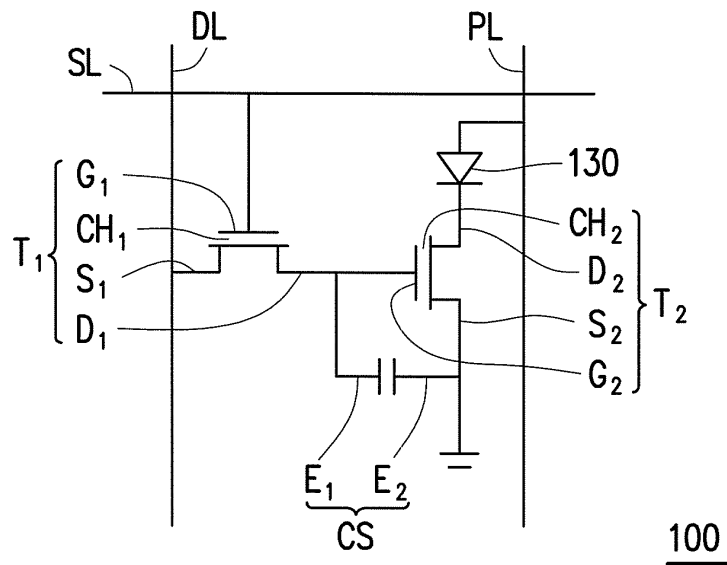


FIG. 1

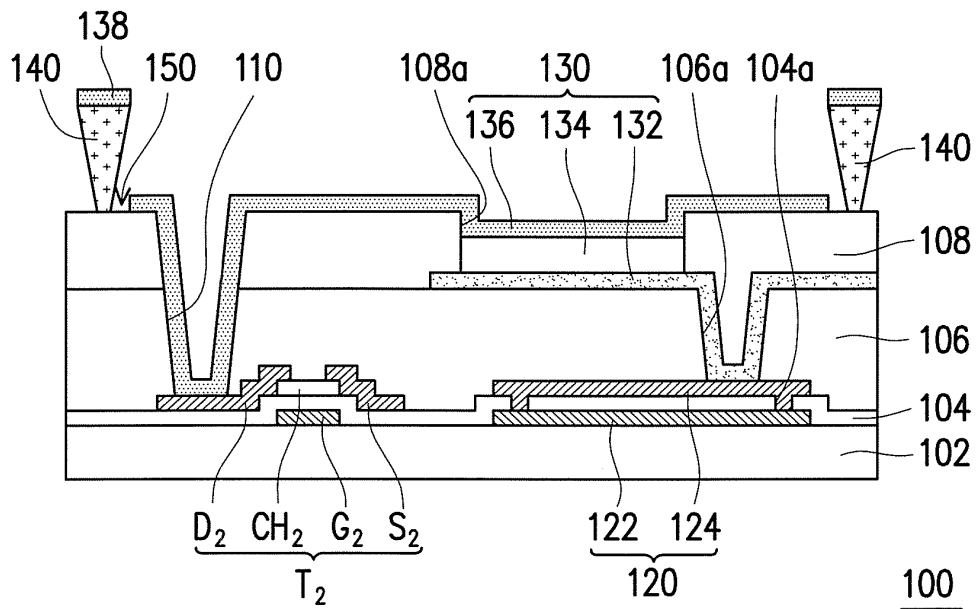


FIG. 2

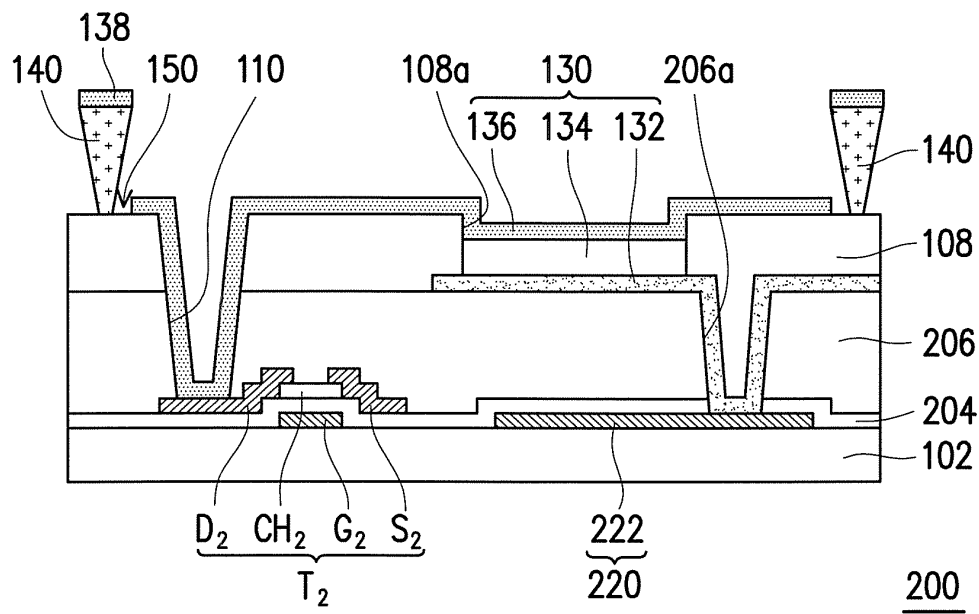


FIG. 3

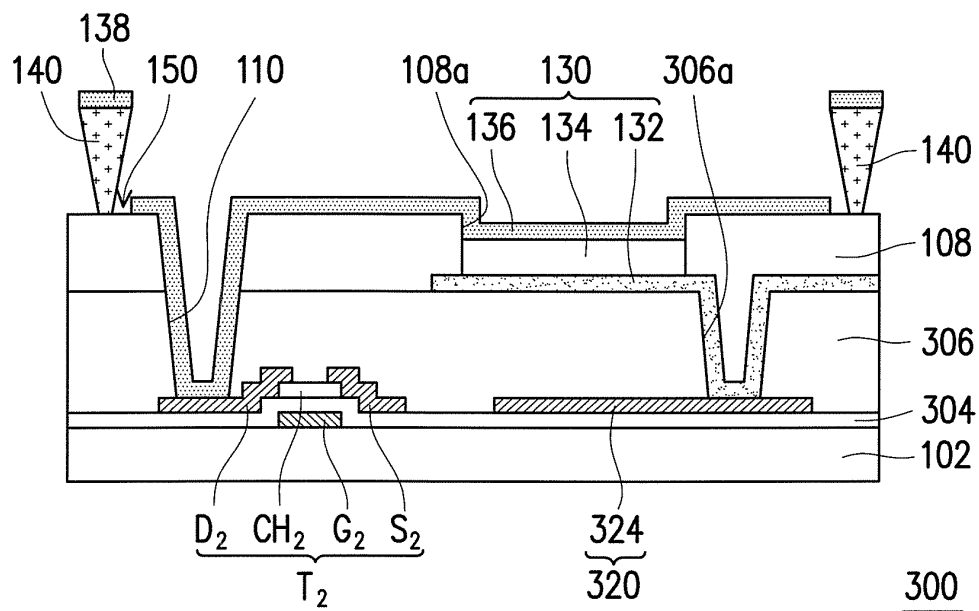


FIG. 4



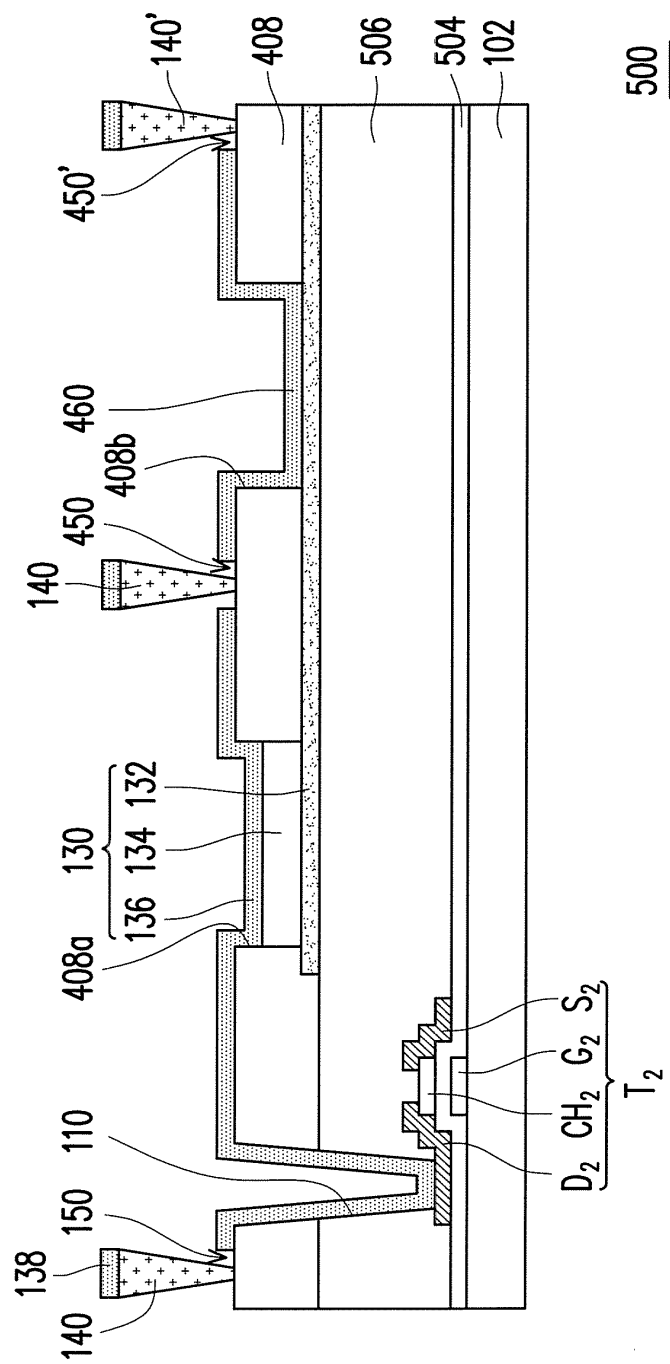


FIG. 6

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	48842-US-PA-1
		Application Number	
Title of Invention	PIXEL STRUCTURE		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor	1				Remove
Legal Name					
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Postal Code		Country ⁱ	TW		
Inventor	2				Remove
Legal Name					
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Residence Information (Select One) US Residency ☒ Non US Residency Active US Military Service					
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Postal Code		Country ⁱ	TW		
Inventor	3				Remove
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		Application Number	
Title of Invention	PIXEL STRUCTURE		

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Address 2	Science-Based Industrial Park,			
City	Hsinchu	State/Province		
Postal Code		Country ⁱ	TW	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.				

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	31561		
Email Address	USA@JCIPGROUP.COM.TW	Add Email	Remove Email
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Application Information:

Title of the Invention	PIXEL STRUCTURE		
Attorney Docket Number	48842-US-PA-1	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	48842-US-PA-1
		Application Number	
Title of Invention	PIXEL STRUCTURE		

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.			
Please Select One:	☒ Customer Number	US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	81561		

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This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78. When referring to the current application, please leave the "Application Number" field blank.			
Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Division of	14447620	2014-07-31
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	48842-US-PA-1
		Application Number	
Title of Invention	PIXEL STRUCTURE		

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Remove Access Code ^j (if applicable)
102133040	TW	2013-09-12	
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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	48842-US-PA-1
		Application Number	
Title of Invention	PIXEL STRUCTURE		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

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A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

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NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	48842-US-PA-1
		Application Number	
Title of Invention	PIXEL STRUCTURE		

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Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant	1	Remove	
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
Clear			
☒ Assignee	Legal Representative under 35 U.S.C. 117		Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor:			
If the Applicant is an Organization check here. ☒			
Organization Name	Au Optronics Corporation		
Mailing Address Information For Applicant:			
Address 1	No. 1, Li-Hsin Rd. II,		
Address 2	Science-Based Industrial Park,		
City	Hsinchu	State/Province	
Country	TW	Postal Code	
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button. Add			

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	48842-US-PA-1
		Application Number	
Title of Invention	PIXEL STRUCTURE		

Assignee	1			
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
Remove				
If the Assignee or Non-Applicant Assignee is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country ⁱ		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add				

Signature:	Remove			
NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).				
This Application Data Sheet must be signed by a patent practitioner if one or more of the applicants is a juristic entity (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, all joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of all joint inventor-applicants.				
See 37 CFR 1.4(d) for the manner of making signatures and certifications.				
Signature	/Belinda Lee/		Date (YYYY-MM-DD)	2015-12-16
First Name	Belinda	Last Name	Lee	Registration Number 46863
Additional Signature may be generated within this form by selecting the Add button. Add				

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	48842-US-PA-1
		Application Number	
Title of Invention	PIXEL STRUCTURE		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

- 1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
- 2 A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
- 3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
- 4 A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
- 5 A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
- 6 A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
- 7 A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
- 8 A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
- 9 A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**DECLARATION AND ASSIGNMENT
FOR UTILITY OR DESIGN PATENT APPLICATION**

☒ Declaration Submitted With Initial Filing

OR

☐ Declaration Submitted After Initial Filing (surcharge 37 CFR 1.16(f) required)

(Title of the Invention)

PIXEL STRUCTURE

As a below named inventor (hereinafter designated as the undersigned), I hereby declare that:

This declaration is directed to:

☒ The attached application,

OR

☐ United States Application Number or PCT International application number

_____ Filed on _____

The above-identified application was made or authorized to be made by me.

I believe I am the original inventor or an original joint inventor of a claimed invention in the application.

**DECLARATION AND ASSIGNMENT
FOR UTILITY OR DESIGN PATENT APPLICATION**

WHEREAS, the undersigned has invented certain new and useful improvements described in the application identified.

WHEREAS 1. Au Optronics Corporation
of No. 1, Li-Hsin Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan,
R.O.C.

hereinafter referred to as ASSIGNEE, is desirous of acquiring the undersigned's interest in the said invention and application and in any U.S. Letters Patent which may be granted on the same:

NOW, THEREFORE, TO ALL WHOM IT MAY CONCERN: Be it known that, for good and valuable consideration, receipt of which is hereby acknowledged by the undersigned, the undersigned has/have sold, assigned and transferred, and by these presents does/do sell, assign and transfer unto the said Assignee, and Assignee's successors and assigns, all his/her/their rights, title and interest in and to the said invention and application and all future improvements thereon, and in and to any Letters Patent which may hereafter be granted on the same in the United States, the said rights, title and interest to be held and enjoyed by said Assignee as fully and exclusively as it would have been held and enjoyed by said the undersigned had this Assignment and transfer not been made, to the full end and term of any Letters Patent which may be granted thereon, or of any division, renewal, continuation in whole or in part, substitution, conversion, reissue, prolongation or extension thereof.

The undersigned further agrees/agree that he/she/they will, without charge to said Assignee, but at Assignee's expense, cooperate with Assignee in the prosecution of said application and/or applications, execute, verify, acknowledge and deliver all such further papers, including applications for Letters Patent and for the reissue thereof, and instruments of assignment and transfer thereof, and will perform such other acts as Assignee Lawfully may request, to obtain or maintain Letters Patent for said invention and improvement, and to vest title thereto in said Assignee, or Assignee's successors and assigns.

The undersigned hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

**DECLARATION AND ASSIGNMENT
FOR UTILITY OR DESIGN PATENT APPLICATION**

Signature: Yi Hsuan Lee Date: July 22, 2014

Legal Name of Sole or First Inventor: Yi-Hsuan Lee

Residence: Taipei City, Taiwan

Mailing Address: c/o No. 1, Li-Hsin Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.

Signature: _____ Date: _____

Legal Name of Additional Joint Inventor, if any: Peng-Bo Xi

Residence: Taipei City, Taiwan

Mailing Address: c/o No. 1, Li-Hsin Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.

Signature: _____ Date: _____

Legal Name of Additional Joint Inventor, if any: Wei-Chu Hsu

Residence: Taipei City, Taiwan

Mailing Address: c/o No. 1, Li-Hsin Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.

**DECLARATION AND ASSIGNMENT
FOR UTILITY OR DESIGN PATENT APPLICATION**

Signature: _____ Date: _____

Legal Name of Sole or First Inventor: Yi-Hsuan Lee

Residence: Taipei City, Taiwan

Mailing Address: c/o No. 1, Li-Hsin Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.

Signature: Peng Bo Xi Date: 2014.7.9

Legal Name of Additional Joint Inventor, if any: Peng-Bo Xi

Residence: Taipei City, Taiwan

Mailing Address: c/o No. 1, Li-Hsin Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.

Signature: _____ Date: _____

Legal Name of Additional Joint Inventor, if any: Wei-Chu Hsu

Residence: Taipei City, Taiwan

Mailing Address: c/o No. 1, Li-Hsin Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.

**DECLARATION AND ASSIGNMENT
FOR UTILITY OR DESIGN PATENT APPLICATION**

Signature: _____ Date: _____

Legal Name of Sole or First Inventor: Yi-Hsuan Lee

Residence: Taipei City, Taiwan

Mailing Address: c/o No. 1, Li-Hsin Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.

Signature: _____ Date: _____

Legal Name of Additional Joint Inventor, if any: Peng-Bo Xi

Residence: Taipei City, Taiwan

Mailing Address: c/o No. 1, Li-Hsin Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.

Signature: Wei-chu Hsu Date: 2014/6/24

Legal Name of Additional Joint Inventor, if any: Wei-Chu Hsu

Residence: Taipei City, Taiwan

Mailing Address: c/o No. 1, Li-Hsin Rd. II, Science-Based Industrial Park, Hsinchu, Taiwan, R.O.C.