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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	11/10/2020	10832616	072827/411598-01497	4833

23363 7590 10/21/2020

Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

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 616 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):

Sang-Shin Lee, Yongin-City, KOREA, REPUBLIC OF;
SAMSUNG DISPLAY CO., LTD., Yongin-City, KOREA, REPUBLIC OF

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.

United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :C46472

Refund Accounting Date:10/15/2020

Effective Date	Sale Item Reference Number	Refund Total
09/28/2020	13872018	$1,900.00

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method	Account Number
I20200ED23005604	1820	RCE- 2ND AND SUBSEQUENT REQUEST	$1,900.00	DA	031728

United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :C46472

Sale Adjustment Accounting Date:10/15/2020

Effective Date	Sale Accounting Date	Sale Item Reference Number
09/28/2020	10/15/2020	13872018

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20200ED23005604	1820	RCE- 2ND AND SUBSEQUENT REQUEST	$1,900.00	DA

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

23363 7590 10/14/2020

Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER	
YANG, KWANG-SU	

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
10/14/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pair_cph@firsttofile.com
pto@lrrc.com

Corrected ***Notice of Allowability***	**Application No.** 13/872,018	**Applicant(s)** Lee, Sang-Shin	
	Examiner KWANG-SU YANG	**Art Unit** 2691	**AIA (FITF) Status** No

-- 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 09/28/2020 QPIDS.
   ☐ 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 1-5,7-9,11-14 and 17 . 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)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✔)
		KR 10-2004-0096706 A	11-17-2004	LG Philips LCD Co., Ltd	Abstract

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

112408024.1 09/28/20 6:05PM

EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	10/08/2020

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/sm

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/ Sheet 1 of 1

United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :70972

Sale Accounting Date:09/29/2020

Sale Item Reference Number	Effective Date
13872018	09/28/2020

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20209S648038383	1806	SUBMISSION- INFORMATION DISCLOSURE STMT	$240.00	Deposit Account

Doc Code: QPIDS.REQ
Document Description: Quick Path Information Disclosure Statement

PTO/SB/09 (09-18)

CERTIFICATION AND REQUEST FOR CONSIDERATION OF AN INFORMATION DISCLOSURE STATEMENT FILED AFTER PAYMENT OF THE ISSUE FEE UNDER THE QPIDS PROGRAM

Non-Provisional Application Number: 13/872,018	Filing Date: April 26, 2013
First Named Inventor: Sang-Shin Lee	Title of Invention: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

THE UNDERSIGNED HEREBY CERTIFIES AND REQUESTS THE FOLLOWING FOR THE ABOVE-IDENTIFIED APPLICATION.

1. Consideration is requested of the information disclosure statement (IDS) submitted herewith, which is being filed after payment of the issue fee.
2. Check the box next to the appropriate selection:

   ☑ Each item of information contained in the IDS was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the IDS. See 37 CFR 1.97(e)(1).

   OR

   ☐ No item of information contained in the IDS was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the IDS was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the IDS. See 37 CFR 1.97(e)(2).

   OR

   ☐ See attached certification statement in compliance with 37 CFR 1.97(e).
3. Please charge the IDS fee set forth in 37 CFR 1.17(p) to Deposit Account No. 03-1728.
4. A Petition to Withdraw from Issue After Payment of the Issue Fee (37 CFR 1.313(c)(2)), including the petition fee set forth in 37 CFR 1.17(h), is submitted herewith as a **Web-based ePetition**. **WARNING:** Do not submit the petition as a follow-on paper via EFS-Web. Submit the petition as a Web-based ePetition by signing on to EFS-Web as a registered user, selecting the radio button next to "Existing application/patent," and then selecting the radio button next to "ePetition (for automatic processing and immediate grant, if all petitions requirements are met)." Failure to use the Web-based ePetition interface will result in automatic entry of the RCE.
5. A request for continued examination (RCE) under 37 CFR 1.114 and the RCE fee under 37 CFR 1.17(e) are submitted herewith.
6. The RCE will be treated as a "conditional" RCE. In the event the examiner determines that any item of information contained in the IDS necessitates the reopening of prosecution in the application, the undersigned understands that (i) the RCE will be processed and treated as an RCE under 37 CFR 1.114 and therefore (ii) the IDS fee under 37 CFR 1.17(p) will be returned in accordance with 37 CFR 1.97(b)(4). In the event that no item of information in the IDS necessitates reopening prosecution, the undersigned understands that the RCE will not be processed and the RCE fee under 37 CFR 1.17(e) will be returned.
7. This certification and request is being filed as a **Web-based ePetition** and is not accompanied by an amendment to the application. Inclusion of an amendment will result in automatic entry of the RCE.

Signature /Jun-Young E. Jeon/	Date September 28, 2020
Name (Print/Typed) Jun-Young E. Jeon	Practitioner Registration Number (If applicable) 43693

Note: *Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required in accordance with 37 CFR 1.33 and 11.18. Please see 37 CFR 1.4(d) for the form of the signature. If necessary, submit multiple forms for more than one signature, see below.**

☐ *Total of _____ forms are submitted.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✔)
		KR 10-2004-0096706 A	11-17-2004	LG Philips LCD Co., Ltd	Abstract

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

112408024.1 09/28/20 6:05PM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/sm

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Young E. Jeon/Si Vuong
Attorney Docket Number:	072827/411598-01497

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
PETITION FEE- 37 CFR 1.17(H) (GROUP III)	1464	1	140	140
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**2040**

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Decision Date : September 28, 2020

In re Application of :

Sang-Shin Lee

DECISION ON PETITION
UNDER CFR 1.313(c)(2)

Application No : 13872018

Filed : 26-Apr-2013

Attorney Docket No : 072827/411598-01497

This is an electronic decision on the petition under 37 CFR 1.313(c)(2), filed September 28, 2020, to withdraw the above-identified application from issue after payment of the issue fee.

The petition is **GRANTED.**

The above-identified application is withdrawn from issue for consideration of a submission under 37 CFR 1.114 (request for continued examination). See 37 CFR 1.313(c)(2).

Petitioner is advised that the issue fee paid in this application cannot be refunded. If, however, this application is again allowed, petitioner may request that it be applied towards the issue fee required by the new Notice of Allowance.

Telephone inquiries concerning this decision should be directed to the Patent Electronic Business Center (EBC) at 866-217-9197.

This application file is being referred to Technology Center AU 2691 for processing of the request for continuing examination under 37 CFR 1.114 .

Office of Petitions

Electronic Acknowledgement Receipt	
EFS ID:	40695317
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Si Vuong
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	28-SEP-2020
Filing Date:	26-APR-2013
Time Stamp:	21:46:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$2040
RAM confirmation Number	E20209RL46283631
Deposit Account	
Authorized User	
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	Petition automatically granted by EFS	petition-request.pdf	31663 261848983606c4502a32d11a4b913362f90983f8	no	2
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	72827_RCE_092820.pdf	701114 e5cb6823a6c44f9ce9a1ae3c6546b5c164e686bf	no	3
Warnings:					
Information:					
3	Quick Path Information Disclosure Statement	72827_QPIDS_092820.pdf	178665 5e7b1ee4e6fff07368492a3b888100add637bf6f	no	2
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	72827_SB08_092820.pdf	96517 f2bf530b42cf9a1dab3d1d92aa001c89ba5b1a35	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
5	Foreign Reference	KR20040096706A.pdf	1326350 d0820ef83f3a4d57438ce32b8f6d8e54fe53e59d	no	19
Warnings:					
Information:					
6	Fee Worksheet (SB06)	fee-info.pdf	32355 ed5a4e63f19e8b1552ebc38257353368688611c5	no	2
Warnings:					

Information:	
Total Files Size (in bytes):	2366664

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

Doc Code: PET.AUTO Document Description: Petition automatically granted by EFS-Web	PTO/SB/140 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**PETITION TO WITHDRAW AN APPLICATION FROM ISSUE AFTER PAYMENT OF THE ISSUE FEE UNDER 37 CFR 1.313(c)**
Application Number	13872018
Filing Date	26-Apr-2013
First Named Inventor	Sang-Shin Lee
Art Unit	2691
Examiner Name	KWANG-SU YANG
Attorney Docket Number	072827/411598-01497
Title	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

An application may be withdrawn from issue for further action upon petition by the applicant. To request that the Office withdraw an application from issue, applicant must file a petition under this section including the fee set forth in § 1.17(h) and a showing of good and sufficient reasons why withdrawal of the application from issue is necessary.

APPLICANT HEREBY PETITIONS TO WITHDRAW THIS APPLICATION FROM ISSUE UNDER 37 CFR 1.313(c).

A grantable petition requires the following items:
(1) Petition fee; and
(2) One of the following reasons:
(a) Unpatentability of one or more claims, which must be accompanied by an unequivocal statement that one or more claims are unpatentable, an amendment to such claim or claims, and an explanation as to how the amendment causes such claim or claims to be patentable;
(b) Consideration of a request for continued examination in compliance with § 1.114 (for a utility or plant application only); or
(c) Express abandonment of the application. Such express abandonment may be in favor of a continuing application, but not a CPA under 37 CFR 1.53(d).

Petition Fee

- ○ Small Entity
- ○ Micro Entity
- ◉ Regular Undiscounted

Reason for withdrawal from issue

○ One or more claims are unpatentable ◉ Consideration of a request for continued examination (RCE) (List of Required Documents and Fees) ○ Applicant hereby expressly abandons the instant application (any attorney/agent signing for this reason must have power of attorney pursuant to 37 CFR 1.32(b)).	
RCE request,submission, and fee. ☐ I certify, in accordance with 37 CFR 1.4(d)(4) that : The RCE request ,submission, and fee have already been filed in the above-identified application on ☒ Are attached.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES 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 been given power of attorney in this application. ○ An attorney or agent registered to practice before the Patent and Trademark Office, acting in a representative capacity. ○ A sole inventor ○ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ○ A joint inventor; all of whom are signing this e-petition	
Signature	/Jun-Young E. Jeon/
Name	Jun-Young E. Jeon
Registration Number	43693

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	09/29/2020	10789880	072827/411598-01497	4833

23363 7590 09/09/2020

Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

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 608 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):

Sang-Shin Lee, Yongin-City, KOREA, REPUBLIC OF;
SAMSUNG DISPLAY CO., LTD., Yongin-City, KOREA, REPUBLIC OF

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.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

23363 7590 05/28/2020
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

Si Vuong	(Typed or printed name)
/Si Vuong/	(Signature)
August 28, 2020 (E-filed)	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

TITLE OF INVENTION: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	08/28/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
YANG, KWANG-SU	2691	345-082000

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 03-09 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,
(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.

1 Lewis Roca Rothgerber Christie LLP
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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE	(B) RESIDENCE: (CITY and STATE OR COUNTRY)
Samsung Display Co., Ltd.	Yongin-si, Republic of Korea

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

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies 0

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 03-1728

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 /Jun-Young E. Jeon/ Date August 28, 2020

Typed or printed name Jun-Young E. Jeon Registration No. 43,693

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

BOE
Exhibit 1027 Page 20

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Young E. Jeon/Si Vuong
Attorney Docket Number:	072827/411598-01497

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1000	1000

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1000**

Electronic Acknowledgement Receipt	
EFS ID:	40418850
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Si Vuong
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	28-AUG-2020
Filing Date:	26-APR-2013
Time Stamp:	18:55:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1000
RAM confirmation Number	E20208RI55390537
Deposit Account	
Authorized User	
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)	72827_IssueFeeTransmittal.pdf	1289219 63fcce19dc6971ff2c797d7a55d7471f647051e3	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30409 e1746212de65e4617c803223ed8b3269e668dae7	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1319628		

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New Applications Under 35 U.S.C. 111
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.
National Stage of an International Application under 35 U.S.C. 371
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.
New International Application Filed with the USPTO as a Receiving Office
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.

PTO/AIA/01 (06-12)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 13/872,018 filed on April 26, 2013.

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

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

I 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.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Sang-Shin Lee Date (Optional): 2020.08.27

Signature: Sang-Shin Lee

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1.11 and 1.14. This collection is estimated to take 1 minute 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, 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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.
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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.
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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.

Electronic Acknowledgement Receipt

EFS ID:	40402448
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Si Vuong
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	27-AUG-2020
Filing Date:	26-APR-2013
Time Stamp:	15:39:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	72827_CorrectedDec_08272020.pdf	126895 ebb5bc0e70c46e5783aa8f9dac4dc921e7b359ef	no	2

Warnings:

Information:	
Total Files Size (in bytes):	126895

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New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
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.
New International Application Filed with the USPTO as a Receiving Office
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Lewis Roca Rothgerber Christie LLP
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Courtesy Reminder for
Application Serial No: 13/872,018

Attorney Docket No: 072827/411598-01497
Customer Number: 23363
Date of Electronic Notification: 05/28/2020

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

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pto@lrrc.com
pair_cph@firsttofile.com

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If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov or call 1-866-217-9197.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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NOTICE OF ALLOWANCE AND FEE(S) DUE

23363 7590 05/28/2020

Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER	
YANG, KWANG-SU	
ART UNIT	PAPER NUMBER
2691	

DATE MAILED: 05/28/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

TITLE OF INVENTION: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	08/28/2020

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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

23363 7590 05/28/2020
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

TITLE OF INVENTION: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	08/28/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
YANG, KWANG-SU	2691	345-082000

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 03-09 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,
(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.

1_____
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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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. _____

BOE
Exhibit 1027 Page 31

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

23363 7590 05/28/2020

Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER	
YANG, KWANG-SU	

ART UNIT	PAPER NUMBER
2691	

DATE MAILED: 05/28/2020

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 30 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. 13/872,018	Applicant(s) Lee, Sang-Shin	
	Examiner KWANG-SU YANG	Art Unit 2691	AIA (FITF) Status No

-- 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 RCE filed on 05/11/2020.
   ☐ 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 1-5,7-9,11-14 and 17 . 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)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/872,018	Lee, Sang-Shin
	Examiner	Art Unit
	KWANG-SU YANG	2691

CPC							
Symbol						Type	Version
G09G	/	3	/	3208		F	2013-01-01
H01L	/	27	/	3218		I	2013-01-01
H01L	/	27	/	3216		I	2013-01-01

CPC Combination Sets								
Symbol						Type	Set	Ranking	Version
	/		/						

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	13	
/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	24 May 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

U.S. Patent and Trademark Office — Part of Paper No.: 20200524

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Exhibit 1027 Page 35

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/872,018	Lee, Sang-Shin
	Examiner	**Art Unit**
	KWANG-SU YANG	2691

INTERNATIONAL CLASSIFICATION				
CLAIMED				
G09G	/	3	/	32
H01L	/	27	/	32

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**
345	82

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 13	
/KWANG-SU YANG/ Primary Examiner, Art Unit 2691 (Primary Examiner)	24 May 2020 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 6

U.S. Patent and Trademark Office — Part of Paper No.: 20200524

BOE
Exhibit 1027 Page 36

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/872,018	Lee, Sang-Shin
	Examiner	Art Unit
	KWANG-SU YANG	2691

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1		10												
2	2	13	11												
3	3	10	12												
4	4	11	13												
5	5	9	14												
	6		15												
6	7		16												
7	8	12	17												
8	9														

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	13	
/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	24 May 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

U.S. Patent and Trademark Office — Part of Paper No.: 20200524

BOE
Exhibit 1027 Page 37

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/872,018	Lee, Sang-Shin
	Examiner	Art Unit
	KWANG-SU YANG	2691

CPC - Searched*		
Symbol	Date	Examiner
G09G3/3208 H01L27/3216 H01L27/3218	06/23/2015	KY

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
345	82	02/12/2020	KY

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/872,018	Lee, Sang-Shin
	Examiner	Art Unit
	KWANG-SU YANG	2691

Search Notes		
Search Notes	**Date**	**Examiner**
EAST: Inventor Search and Assignee Search	06/23/2015	KY
EAST: Text Search	06/23/2015; 06/24/2015	KY
EAST: IDS Search	10/12/2015	KY
EAST: Updated Text Search	02/22/2016; 02/23/2016	KY
EAST: IDS Search	06/17/2016	KY
EAST: Updated Text Search	07/26/2016; 08/29/2016	KY
EAST: Updated Text Search	12/23/2016	KY
EAST: Updated Text Search	05/05/2017	KY
Updated Classification Search (G09G3/3208 H01L27/3216 H01L27/3218)	02/12/2020	KY
EAST: Updated Text Search	02/12/2020	KY
EAST: IDS Search	02/12/2020	KY
EAST: IDS Search	05/24/2020	KY

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
US-PGPUB; USPAT	((pixel sub$1pixel) same organic adj light same display same virtual adj square same third same second adj (vertex node) same shortest adj distance same polygon$2 same (larg$2 great$2 small$2 less)).clm.	02/12/2020	KY
US-PGPUB; USPAT	((pixel sub$1pixel) same organic adj light same display same virtual adj square same third same second adj (vertex node) same shortest adj distance same (larg$2 great$2 small$2 less)).clm.	02/12/2020	KY

/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	

Bibliographic Data

Application No: 13/872,018

Foreign Priority claimed: (•) Yes ( ) No

35 USC 119 (a-d) conditions met: [✓] Yes [ ] No [ ] Met After Allowance

Verified and Acknowledged: /KWANG-SU YANG/ Examiner's Signature [ ] Initials

Title: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
04/26/2013	345	2691	072827/411598-01497
RULE			

APPLICANTS

SAMSUNG DISPLAY CO., LTD., Yongin-City, KOREA, REPUBLIC OF

INVENTORS

Sang-Shin Lee Yongin-City, KOREA, REPUBLIC OF

CONTINUING DATA

This application is a CIP of 13614197 09/13/2012 PAT 9818803

FOREIGN APPLICATIONS

KOREA, REPUBLIC OF 10-2012-0022967 03/06/2012

KOREA, REPUBLIC OF 10-2013-0044993 04/23/2013

IF REQUIRED, FOREIGN LICENSE GRANTED**

05/28/2013

STATE OR COUNTRY

KOREA, REPUBLIC OF

ADDRESS

Lewis Roca Rothgerber Christie LLP

PO BOX 29001

Glendale, CA 91209-9001

UNITED STATES

FILING FEE RECEIVED

$1,600

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	13	("7710484" "7982786" "20030128225" "20100117528").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/05/24 18:05

EAST Search History (Interference)

<This search history is empty>

5/24/2020 6:35:56 PM
C:\Users\kyang\Documents\EAST\Workspaces\13872018.wsp

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	YANG, KWANG-SU

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		7,710,484 B2	05-04-2010	Oda
		7,982,786 B2	07-19-2011	Nishida et al.
		2003/0128225 A1	07-10-2003	Credelle et al.
		2010/0117528 A1	05-13-2010	Fukuda

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✔)

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office Action dated April 30, 2020, issued in U.S. Patent Application No. 16/505,536 (14 pages)

EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	05/24/2020

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/frs

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

111190648.1

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	YANG, KWANG-SU

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		7,710,484 B2	05-04-2010	Oda
		7,982,786 B2	07-19-2011	Nishida et al.
		2003/0128225 A1	07-10-2003	Credelle et al.
		2010/0117528 A1	05-13-2010	Fukuda

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✔)

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office Action dated April 30, 2020, issued in U.S. Patent Application No. 16/505,536 (14 pages)

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/frs

111190648.1

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Attorney Docket Number:	072827/411598-01497

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
		Total in USD ($)		**1900**

Electronic Acknowledgement Receipt	
EFS ID:	39409960
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	11-MAY-2020
Filing Date:	26-APR-2013
Time Stamp:	18:49:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1900
RAM confirmation Number	E20205AI49329887
Deposit Account	
Authorized User	
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	Request for Continued Examination (RCE)	72827_RCE.pdf	1353247 c3b67e0f4ca04e6b7f25d5f34f1268bfd0c759b3	no	3
Warnings:					
Information:					
2		72827_IDS.pdf	148014 49e63cadee18128088b2b680e80b8ab68f4b0635	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	4-30-20_OA_174060.pdf	435371 106bc2681166d448e91cba377e809c4d3718ac0b	no	14
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30962 fca59a6ca3ec5bd48ae45627b445c55bef0bfd19	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1967594		

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13/872,018	Filing Date	2013-04-26	Docket Number (if applicable)	072827/411598-01497	Art Unit	2691
First Named Inventor	Sang-Shin Lee			Examiner Name	KWANG-SU YANG		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☐ Amendment/Reply
- ☒ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 031728

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

Signature of Registered U.S. Patent Practitioner			
Signature	/Jun-Young E. Jeon/	Date (YYYY-MM-DD)	2020-05-11
Name	Jun-Young E. Jeon	Registration Number	43693

This collection of information is required by 37 CFR 1.114. 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 1.11 and 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, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on May 11, 2020 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

/Elizabeth Gomez/
Elizabeth Gomez

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: KWANG-SU YANG	
Docket No.	: 072827	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
May 11, 2020

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. A copy of the listed Other Documents reference is enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By /Jun-Young E. Jeon/
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/eg
Enclosures: Information Disclosure Statement, w/references

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

7590 04/24/2020

Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER	
YANG, KWANG-SU	
ART UNIT	PAPER NUMBER
2691	
NOTIFICATION DATE	DELIVERY MODE
04/24/2020	ELECTRONIC

NOTICE REQUIRING INVENTOR'S OATH OR DECLARATION

☐ An inventor's oath or declaration in compliance with 37 CFR 1.63 or substitute statement in compliance with 37 CFR 1.64 executed by or with respect to each inventor has not yet been submitted.

The inventor's oath or declaration or substitute statement dated 4/26/2013 is defective. The inventor's oath or declaration does not comply with 37 CFR 1.63 or the substitute statement does not comply with 37 CFR 1.64 because it:

☐ does not include a statement that the person executing the oath or declaration or substitute statement believes the named inventor or joint inventor to be the original inventor or an original joint inventor of a claimed invention in the application for which the oath or declaration is being submitted.

☐ does not state that the application was made or was authorized to be made by the person executing the oath or declaration or substitute statement.

☐ does not acknowledge that any willful false statement made in such oath or declaration or substitute statement is punishable under section 1001 of title 18 by fine or imprisonment of not more than 5 years, or both.

☐ does not identify the person executing the oath or declaration or substitute statement by his or her legal name.

☐ does not identify the application to which the oath or declaration or substitute statement is directed.

☑ Other: name mismatch Sang-Shin Lee vs. Sang Shin Lee

The substitute statement dated _____ does not comply with 37 CFR 1.64 because it:

☐ does not identify the inventor with respect to whom the statement applies.

☐ does not identify the relationship to the non-signing inventor.

☐ does not identify the circumstances permitting execution of the statement.

☐ was signed by someone other than the applicant.

☐ Other: _____

An oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each inventor MUST be filed **no later than the date on which the issue fee is paid.** See 35 U.S.C. 115(f). Failure to timely comply will result in ABANDONMENT of this application. This period for reply is not extendable under 37 CFR 1.136(a).

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

/Kevin Danemark/, for

(571)-272-4200 or 1(888)-786-0101
Patent Publication Branch
Office of Data Management

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/872,018	04/26/2013	2691	1600	072827/411598-01497	13	1

CONFIRMATION NO. 4833

CORRECTED FILING RECEIPT

23363
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

OC000000118441550

Date Mailed: 04/23/2020

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Sang-Shin Lee, Yongin-City, KOREA, REPUBLIC OF;

Applicant(s)

SAMSUNG DISPLAY CO., LTD., Yongin-City, KOREA, REPUBLIC OF

Assignment For Published Patent Application

SAMSUNG DISPLAY CO., LTD., Yongin-City, KOREA, REPUBLIC OF

Power of Attorney: The patent practitioners associated with Customer Number 23363

Domestic Priority data as claimed by applicant

This application is a CIP of 13/614,197 09/13/2012 PAT 9818803

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
REPUBLIC OF KOREA 10-2012-0022967 03/06/2012 No Access Code Provided
REPUBLIC OF KOREA 10-2013-0044993 04/23/2013 No Access Code Provided

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

Request to Retrieve - This application either claims priority to one or more applications filed in an intellectual property Office that participates in the Priority Document Exchange (PDX) program or contains a proper **Request to Retrieve Electronic Priority Application(s)** (PTO/SB/38 or its equivalent). Consequently, the USPTO will attempt to electronically retrieve these priority documents.

If Required, Foreign Filing License Granted: 05/28/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/872,018**
Projected Publication Date: Not Applicable
Non-Publication Request: No
Early Publication Request: No
Title

PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Preliminary Class

345

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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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 U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

23363 7590 04/09/2020

Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER	
YANG, KWANG-SU	

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
04/09/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pair_cph@firsttofile.com
pto@lrrc.com

Corrected ***Notice of Allowability***	**Application No.** 13/872,018	**Applicant(s)** Lee, Sang-Shin	
	Examiner KWANG-SU YANG	**Art Unit** 2691	**AIA (FITF) Status** No

-- 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 03/27/2020 IDS.
   ☐ 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 1-5,7-9,11-14 and 17 . 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)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	YANG, KWANG-SU

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2009-230096 A	10-08-2009	Mitsubishi Electric Corp.	Abstract
		JP 2011-198761 A	10-06-2011	Samsung Mobile Display Co., Ltd.	Abstract
		WO 03/053068 A2	06-26-2003	Clairvoyante Laboratories, Inc.	

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	04/03/2020

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/frs

110830833.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	YANG, KWANG-SU

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2009-230096 A	10-08-2009	Mitsubishi Electric Corp.	Abstract
		JP 2011-198761 A	10-06-2011	Samsung Mobile Display Co., Ltd.	Abstract
		WO 03/053068 A2	06-26-2003	Clairvoyante Laboratories, Inc.	

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/frs

110830833.1

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Young E. Jeon/Felicia Sutphen
Attorney Docket Number:	072827/411598-01497

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
		Total in USD ($)		**240**

Electronic Acknowledgement Receipt	
EFS ID:	38990856
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Felicia Sutphen
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	27-MAR-2020
Filing Date:	26-APR-2013
Time Stamp:	14:11:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$240
RAM confirmation Number	E20203QE11386002
Deposit Account	
Authorized User	
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		72827_SupplDS.PDF	137849 0eadcd50bbfaf03a9a9d5d6057e76c0e7f4c6962	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Foreign Reference	JP2009230096A.pdf	3815210 f3ca5044f975d3faed157961ed29becdde7613f1	no	14
Warnings:					
Information:					
3	Foreign Reference	JP2011198761A.pdf	5288634 93d09faf535e2261a65a2925f9bfd0e25def4937	no	18
Warnings:					
Information:					
4	Foreign Reference	WO03053068A2.PDF	2429070 351cf159bc73339e8dcfd6c5889971922ea2ea15	no	37
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30686 4e2d9af126788ce859416dc747c0956de820a287	no	2
Warnings:					
Information:					

Total Files Size (in bytes):	11701449

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on March 27, 2020 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

/Felicia R. Sutphen/
Felicia R. Sutphen

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: YANG, KWANG-SU	
Docket No.	: 072827	

SUPPLEMENTAL
INFORMATION DISCLOSURE STATEMENT WITH FEE
UNDER 37 CFR §§ 1.97(d) AND 1.17(p)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
March 27, 2020

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. Copies of each of the listed Foreign Patent Documents and Other Documents references are enclosed.

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Applicant's undersigned attorney hereby certifies, in accordance with 37 CFR § 1.97(e)(1), that each item of information contained in the information disclosure statement was first cited in a communication from any foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

The processing fee of $240.00 as required by 37 CFR § 1.17(p) is submitted herewith. The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By /Jun-Young E. Jeon/
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/frs
Enclosures: Information Disclosure Statement, w/references

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

23363 7590 02/19/2020
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER	
YANG, KWANG-SU	
ART UNIT	PAPER NUMBER
2691	

DATE MAILED: 02/19/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

TITLE OF INVENTION: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	05/19/2020

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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (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)

23363 7590 02/19/2020
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

TITLE OF INVENTION: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1000	$0.00	$0.00	$1000	05/19/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
YANG, KWANG-SU	2691	345-082000

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 03-09 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,
(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.

1_____
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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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. _____

BOE
Exhibit 1027 Page 71

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

23363 7590 02/19/2020

Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER	
YANG, KWANG-SU	

ART UNIT	PAPER NUMBER
2691	

DATE MAILED: 02/19/2020

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 30 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. 13/872,018	Applicant(s) Lee, Sang-Shin	
	Examiner KWANG-SU YANG	Art Unit 2691	AIA (FITF) Status No

-- 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 RCE filed on 01/29/2020.
   ☐ 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 1-5,7-9,11-14 and 17 . 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)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/872,018	Lee, Sang-Shin
	Examiner	**Art Unit**
	KWANG-SU YANG	2691

CPC							
Symbol						**Type**	**Version**
G09G	/	3	/	3208		F	2013-01-01
H01L	/	27	/	3218		I	2013-01-01
H01L	/	27	/	3216		I	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	13	
/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	12 February 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

U.S. Patent and Trademark Office — Part of Paper No.: 20200212

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Exhibit 1027 Page 75

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/872,018	Lee, Sang-Shin
	Examiner	Art Unit
	KWANG-SU YANG	2691

INTERNATIONAL CLASSIFICATION				
CLAIMED				
G09G	/	3	/	32
H01L	/	27	/	32

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS
345	82

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	13	
/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	12 February 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

U.S. Patent and Trademark Office — Part of Paper No.: 20200212

BOE
Exhibit 1027 Page 76

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/872,018	Lee, Sang-Shin
	Examiner	Art Unit
	KWANG-SU YANG	2691

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1		10												
2	2	13	11												
3	3	10	12												
4	4	11	13												
5	5	9	14												
	6		15												
6	7		16												
7	8	12	17												
8	9														

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	13	
/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	12 February 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

U.S. Patent and Trademark Office — Part of Paper No.: 20200212

BOE
Exhibit 1027 Page 77

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/872,018	Lee, Sang-Shin
	Examiner	Art Unit
	KWANG-SU YANG	2691

CPC - Searched*		
Symbol	Date	Examiner
G09G3/3208 H01L27/3216 H01L27/3218	06/23/2015	KY

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
345	82	02/12/2020	KY

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13/872,018	Lee, Sang-Shin
	Examiner	Art Unit
	KWANG-SU YANG	2691

Search Notes		
Search Notes	**Date**	**Examiner**
EAST: Inventor Search and Assignee Search	06/23/2015	KY
EAST: Text Search	06/23/2015; 06/24/2015	KY
EAST: IDS Search	10/12/2015	KY
EAST: Updated Text Search	02/22/2016; 02/23/2016	KY
EAST: IDS Search	06/17/2016	KY
EAST: Updated Text Search	07/26/2016; 08/29/2016	KY
EAST: Updated Text Search	12/23/2016	KY
EAST: Updated Text Search	05/05/2017	KY
Updated Classification Search (G09G3/3208 H01L27/3216 H01L27/3218)	02/12/2020	KY
EAST: Updated Text Search	02/12/2020	KY
EAST: IDS Search	02/12/2020	KY

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
US-PGPUB; USPAT	((pixel sub$1pixel) same organic adj light same display same virtual adj square same third same second adj (vertex node) same shortest adj distance same polygon$2 same (larg$2 great$2 small$2 less)).clm.	02/12/2020	KY
US-PGPUB; USPAT	((pixel sub$1pixel) same organic adj light same display same virtual adj square same third same second adj (vertex node) same shortest adj distance same (larg$2 great$2 small$2 less)).clm.	02/12/2020	KY

/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	19421	(G09G3/3208 H01L27/3216 H01L27/3218).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 17:14
L2	70	L1 and third adj (pixel sub$1pixel) with square and (organic adj light OLED)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 17:14
L3	19	2 and (@ad < "20130306" @rlad < "20130306")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 17:15
L4	132	third adj (pixel sub$1pixel) with square and (organic adj light OLED)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 17:16
L5	23	4 and (@ad < "20130306" @rlad < "20130306")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 17:17
L8	10	("7110031" "9431469" "20130106891").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 17:46
L9	8	("20020140833" "20110291549" "20130002911").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 17:50
L10	4	"4642619".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 18:00
L11	5	("20040246426" "20130057521").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 18:02
L12	5	"9837476".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 18:04
S96	5881	345/82.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 17:04
S97	3	S96 and third adj (pixel sub$1pixel) with square and (organic adj light OLED)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 17:05

S98	19421	(G09G3/3208 H01L27/3216 H01L27/3218).CPC.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2020/02/12 17:06

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	0	((pixel sub$1pixel) same organic adj light same display same virtual adj square same third same second adj (vertex node) same shortest adj distance same polygon$2 same (larg$2 great$2 small$2 less)).clm.	US-PGPUB; USPAT	OR	ON	2020/02/12 17:21
L7	0	((pixel sub$1pixel) same organic adj light same display same virtual adj square same third same second adj (vertex node) same shortest adj distance same (larg$2 great$2 small$2 less)).clm.	US-PGPUB; USPAT	OR	ON	2020/02/12 17:21

2/ 12/ 2020 6:16:00 PM
C:\ Users\ kyang\ Documents\ EAST\ Workspaces\ 13872018.wsp

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		7,110,031 B2	09-19-2006	Kondo et al.
		9,431,469 B2	08-30-2016	Park et al.
		2013/0106891 A1	05-02-2013	Matsueda et al.

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OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office Action dated September 3, 2019, issued in U.S. Patent Application No. 16/261,437 (11 pages)
		U.S. Office Action dated October 25, 2019, issued in U.S. Patent Application No. 16/505,536 (14 pages)

EG 109756297.1-*-11/15/2019 12:07 PM

EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	02/12/2020

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

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	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		CN 101449382 A	06-03-2009	Smith et al.	Abstract
		CN 103311266 A	09-18-2013	Lee	Abstract
		CN 203260586 U	10-30-2013	Lee	Abstract
		CN 105206647 A	12-30-2015	Lee	Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

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EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	02/12/2020

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
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	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		4,642,619	02-10-1987	Togashi

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 3-36239	05-30-1991	Togashi	Corresponds to U.S. 4,642,619, listed above

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

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Bibliographic Data

Application No: 13/872,018

Foreign Priority claimed: (•) Yes ( ) No

35 USC 119 (a-d) conditions met: [x] Yes [ ] No [ ] Met After Allowance

Verified and Acknowledged: /KWANG-SU YANG/ Examiner's Signature [ ] Initials

Title: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
04/26/2013	345	2691	072827/411598-01497
RULE			

APPLICANTS

SAMSUNG DISPLAY CO., LTD., Yongin-City, KOREA, REPUBLIC OF

INVENTORS

Sang-Shin Lee Yongin-City, KOREA, REPUBLIC OF

CONTINUING DATA

This application is a CIP of 13614197 09/13/2012 PAT 9818803

FOREIGN APPLICATIONS

KOREA, REPUBLIC OF 10-2012-0022967 03/06/2013

KOREA, REPUBLIC OF 10-2013-0044993 04/23/2013

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
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	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		20020140833-A1	10-03-2002	Hirai
		20110291549-A1	12-01-2011	Kim et al.
		20130002911-A1	01-03-2013	Miyashita et al.

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OTHER DOCUMENTS

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		Office action issued in U.S. Application No. 15/811,599 by the USPTO, dated July 19, 2019, 19 pages.

109103141_1

EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	02/12/2020

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	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

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FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		CN 101009304 A	08-01-2007	Zhao et al.	Abstract

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EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

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EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	02/12/2020

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	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		2004/0246426 A1	12-09-2004	Wang et al.
		2013/0057521 A1	03-07-2013	Kim

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EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

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		U.S. Office Action dated July 11, 2018, issued in U.S. Patent Application No. 15/811,599 (19 pages)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
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	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

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		JP 2003-203770 A	07-18-2003	TOSHIBA CORP	Japan Patent Abstract

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		9,837,476 B2	12-05-2017	Park et al.

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EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2004-179028 A	06-24-2004	Takahashi	Japan Patent Abstract
		JP 2005-5227 A	01-06-2005	Kawachi et al.	Japan Patent Abstract
		JP 2010-153173 A	07-08-2010	Ikeda et al.	Japan Patent Abstract

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		U.S. Office Action dated March 19, 2018, issued in U.S. Patent Application No. 15/688,760 (13 pages)

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13872018
Filing Date	2013-04-26
First Named Inventor	Sang-Shin Lee
Art Unit	2691
Examiner Name	YANG, KWANG-SU
Attorney Docket Number	072827/411598-01497

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1	2007-156126	JP	A	2007-06-21	EPSON IMAGING DEVICES CORP	Abstract	
	2	2008-300367	JP	A	2008-12-11	SANYO ELECTRIC CO LTD	Abstract	
	3	2010-3880	JP	A	2010-01-07	SONY CORP	Abstract	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13872018
Filing Date	2013-04-26
First Named Inventor	Sang-Shin Lee
Art Unit	2691
Examiner Name	YANG, KWANG-SU
Attorney Docket Number	072827/411598-01497

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		

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EXAMINER SIGNATURE

Examiner Signature	/KWANG-SU YANG/	Date Considered	02/12/2020

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Application Number	13872018
	Filing Date	2013-04-26
	First Named Inventor	Sang-Shin Lee
	Art Unit	2691
	Examiner Name	YANG, KWANG-SU
	Attorney Docket Number	072827/411598-01497

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jun-Young E. Jeon/	Date (YYYY-MM-DD)	2019-11-25
Name/Print	Jun-Young E. Jeon	Registration Number	43693

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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, 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.**

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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 record s.

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.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2006-18195 A	01-19-2006	JAPAN BROADCASTING CORP	Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EG 106757855.1-*-12/07/2018 10:40 AM

EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	02/12/2020

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	YANG, KWANG-SU

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		2012/0049726 A1	03-01-2012	Yoo et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		KR 10-2009-0049515 A	05-18-2009	Samsung Display Co., Ltd.	Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	02/12/2020

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	YANG, KWANG-SU

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		EP 2 637 209 A1	09-11-2013	Samsung Display Co., Ltd.	

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		EPO Communication Pursuant to Article 94(3) EPC, for Patent Application No. 13 178 648.5, mailed January 31, 2019, 8 pages.

EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	02/12/2020

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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/872,018	Filing Date 04/26/2013	☐ To be Mailed

ENTITY: ☑ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $80 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $420 =	
☐ 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).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	01/29/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 13	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0		x $460 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/ALLYSON PURNELL/
*** 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 number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. 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, 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	13872018	Filing Date	2013-04-26	Docket Number (if applicable)	072827	Art Unit	2691
First Named Inventor	Sang-Shin Lee			Examiner Name	Kwang-Su Yang		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

☐ Other _____

☒ Enclosed

☒ Amendment/Reply

☐ Information Disclosure Statement (IDS)

☐ Affidavit(s)/ Declaration(s)

☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

☒ The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 031728

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

X Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

Signature of Registered U.S. Patent Practitioner			
Signature	/Justin O. Ehresmann/	Date (YYYY-MM-DD)	2020-01-29
Name	Justin O. Ehresmann, Ph.D.	Registration Number	73867

This collection of information is required by 37 CFR 1.114. 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 1.11 and 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, VA 22313-1450.

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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)).

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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.

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Justin O. Ehresmann/Sherlin Yaghoubzadeh
Attorney Docket Number:	072827/411598-01497

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1900	1900
		Total in USD ($)		**1900**

Electronic Acknowledgement Receipt	
EFS ID:	38437283
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Justin O. Ehresmann/Sherlin Yaghoubzadeh
Filer Authorized By:	Justin O. Ehresmann
Attorney Docket Number:	072827/411598-01497
Receipt Date:	29-JAN-2020
Filing Date:	26-APR-2013
Time Stamp:	17:23:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1900
RAM confirmation Number	E20201SH23158988
Deposit Account	
Authorized User	
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		72827_Amendment_RCE.pdf	127786 6e61bafe06eafca749372ab07414d36c89d003b3	yes	8

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment Submitted/Entered with Filing of CPA/RCE	1	1
Claims	2	5
Applicant Arguments/Remarks Made in an Amendment	6	8

Warnings:					
Information:					
2	Request for Continued Examination (RCE)	72827_RCE.pdf	1349942 ca01178020daf0376c78352833d518a3ec1fecea	no	3
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30968 27eb88c87acf2a4a1f0a90a792098c33f72b6340	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1508696		

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on January 29, 2020 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

/Sherlin Yaghoubzadeh/
Sherlin Yaghoubzadeh

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 072827	
Customer No.	: 23363	

AMENDMENT
A REQUEST FOR CONTINUED EXAMINATION

Mail RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
January 29, 2020

Commissioner:

This paper is in response to the Decision on Appeal of December 2, 2019, which set an initial period for reply to expire on February 2, 2020. As such, this response is timely filed. Please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex;

an other first pixel on a line defined by the center of the virtual square and the first vertex, the first pixel, the second pixel, and the other first pixel being consecutive pixels on the line; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

wherein a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length,

wherein a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels,

wherein the second pixel and the third pixel have polygonal shapes, and

wherein the second pixel has a larger area than that of the third pixel.

2. (Original) The pixel arrangement structure of claim 1, wherein
the second pixel comprises a pair of second pixels, and
the second pixels are separated from each other by the first pixel.

3. (Original) The pixel arrangement structure of claim 1, wherein
the third pixel comprises a pair of third pixels, and
the third pixels are separated from each other by the first pixel.

4. (Original) The pixel arrangement structure of claim 1, wherein
the second pixel comprises a pair of second pixels,
the third pixel comprises a pair of third pixels, and
the second pixels and the third pixels enclose the first pixel in the virtual square.

5. (Original) The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

6. (Canceled)

7. (Previously Presented) The pixel arrangement structure of claim 5, wherein one of the second pixel and the third pixel has a hexagonal shape and another of the second pixel and the third pixel has a quadrilateral shape.

8. (Previously Presented) The pixel arrangement structure of claim 7, wherein the first pixels are symmetrical to each other.

9. (Original) The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. (Canceled)

11. (Previously Presented) A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

the first pixel, the second pixel, and the third pixel have polygonal shapes,

a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length, and

a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels.

12. (Original) The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. (Previously Presented) The pixel arrangement structure of claim 1, wherein the first pixel is configured to emit green light,

one of the second pixel and the third pixel is configured to emit blue light, and

another of the second pixel and the third pixel is configured to emit red light.

14. (Previously Presented) The pixel arrangement structure of claim 5, wherein at least one of the second pixel and the third pixel has a hexagonal shape.

15-16. (Canceled)

17. (Previously Presented) The pixel arrangement structure of claim 1, wherein the second pixel has a different polygonal shape from the third pixel.

REMARKS/ARGUMENTS

Claims 1-5, 7-9, 11-14, and 17 are pending in the present application, of which claims 1 and 11 are independent. Claims 6, 15, and 16 were previously canceled without prejudice or disclaimer. Claim 1 is amended herein to incorporate certain features of claim 11, and claim 10 is canceled herein without prejudice or disclaimer. No new matter has been introduced. Applicant respectfully requests reconsideration and allowance of claims 1-5, 7-9, 11-14, and 17.

Claim Rejection Under 35 U.S.C. § 102

Claim 11 was rejected under pre-AIA 35 U.S.C. §102(b) as allegedly anticipated by Credelle et al. (U.S. Patent App. Pub. No. 2003/0128179, hereafter "Credelle").

Page 5 of the December 2, 2019, Decision on Appeal states that the rejection of claim 11 under pre-AIA 35 U.S.C. §102(b) is not sustained. Accordingly, Applicant respectfully requests that the rejection of claim 11 be withdrawn, and that this claim be allowed.

Claim Rejections under 35 U.S.C. § 103

Claims 1-5 and 12 were rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Kim et al. (U.S. Patent App. Pub. No. 2004/0183764, hereafter "Kim"). Claim 13 was rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Kim, and further in view of Inuiya et al. (U.S. Patent No. 6,882,364, hereafter "Inuiya"). In addition, Claims 7-10, 14, and 17 were rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Kim, and further in view of Chao et al. (U.S. Patent App. Pub. No. 2008/0001525, hereafter "Chao").

In the interest of advancing prosecution of the present application, independent claim 1 is amended herein to incorporate certain features of independent claim 11. Specifically, claim 1 is amended herein to further recite, "wherein a shortest distance between the first pixel and the second pixel as well as a shortest distance between the

first pixel and the third pixel is a same first length," and "wherein a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels."

For at least reasons substantially the same as those set forth on page 5 of the Decision on Appeal, Applicant submits that amended claim 1 would not have been obvious Credell, Kim, Inuiya, and Chao. Accordingly, Applicant requests that the rejection of claim 1 be withdrawn and that this claim be allowed.

Because claims 2-5, 7-9, 12-14, and 17 each depend, directly or indirectly, from claim 1, they each incorporate all the terms and features of claim 1 in addition to other features, which together further patentably distinguish the claim over the cited references. Therefore, claims 2-5, 7-9, 12-14, and 17 should also be allowable over Credelle, Kim, Inuiya, and Chao. Accordingly, Applicant respectfully requests that the rejections of claims 2-5, 7-9, 12-14, and 17 be withdrawn and that these claims be allowed as well.

[The remainder of this page is intentionally left blank.]

Concluding Remarks

In view of the foregoing amendments and remarks, Applicant earnestly solicits a timely issuance of a Notice of Allowance. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call Applicant's attorney at the number listed below.

Payment of any fee required to enter and process this amendment is provided. The Director is authorized to charge any underpayment of fees or credit any overpayment of fees to Deposit Account No. 03-1728.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By /Justin O. Ehresmann/
Justin O. Ehresmann, Ph.D.
Reg. No. 73,867
626/795-9900

JOE/joe

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

23363 7590 12/02/2019

Lewis Roca Rothgerber Christie LLP
PO BOX 29001
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EXAMINER	
YANG, KWANG-SU	

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
12/02/2019	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SANG-SHIN LEE

Appeal 2018-004596
Application 13/872,018
Technology Center 2600

Before ST. JOHN COURTENAY III, JOHN P. PINKERTON, and JASON J. CHUNG, *Administrative Patent Judges*.

CHUNG, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals the Final Rejection of claims 1–5, 7–14, and 17.[2] We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

INVENTION

The invention relates to a pixel arrangement structure for an organic light emitting diode (OLED) display. Spec. ¶ 2. Claims 1 and 11 are illustrative of the invention and are reproduced below:

> 1. A pixel arrangement structure of an organic light emitting diode (OLEO) display, comprising:

---

[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. According to Appellant, Samsung Display Co., Ltd. is the real party in interest. Appeal Br. 1.

[2] Claims 6, 15, and 16 are cancelled. Appeal Br. 12, 14.

> a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLEO display and comprising:
>
> a first pixel having a center coinciding with a center of a virtual square;
>
> another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;
>
> a second pixel separated from the first pixels and having a center at the first vertex;
>
> an other first pixel on a line defined by the center of the virtual square and the first vertex, the first pixel, the second pixel, and the other first pixel being consecutive pixels on the line; and
>
> a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,
>
> wherein the second pixel and the third pixel have polygonal shapes, and
>
> wherein the second pixel has a larger area than that of the third pixel.

Appeal Br. 11 (Claims Appendix).

> 11. A pixel arrangement structure of an organic light emitting diode (OLEO) display, comprising:
>
> a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLEO display and comprising:
>
> a first pixel having a center coinciding with a center of a virtual square;
>
> another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to

> emit different color light;
>
> a second pixel separated from the first pixels and having a center at the first vertex; and
>
> a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,
>
> the first pixel, the second pixel, and the third pixel have polygonal shapes,
>
> a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length, and
>
> a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels.

Id. at 13–14 (Claims Appendix).

REJECTIONS AT ISSUE[3]

Claim 11 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Credelle (US 2003/0128179 A1; published July 10, 2003). Final Act. 2–4; Ans. 3–5.

Claims 1–5 and 12 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Credelle and Kim (US 2004/0183764 A1; published Sept. 23, 2004). Final Act. 4–8; Ans. 6–9.

Claims 7–10, 14, and 17 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Credelle, Kim, and Chao (US 2008/0001525 A1; published Jan. 3, 2008). Final Act. 8–11; Ans. 9–12.

Claim 13 stands rejected under 35 U.S.C. § 103 as being unpatentable

[3] Appellant refers to claim 11 as being rejected under 35 U.S.C. § 103 in its heading. Appeal Br. 7. However, claim 11 is rejected under 35 U.S.C. § 102(b), not under 35 U.S.C. § 103. We, therefore, consider Appellant's inclusion of claim 11 as being rejected under 35 U.S.C. § 103 as a typographical error.

over the combination of Credelle, Kim, and Inuiya (US 6,882,364 B1; issued Apr. 19, 2005). Final Act. 12; Ans. 12–13.

ANALYSIS

I. Claim 11 Rejected Under 35 U.S.C. § 102(b)

The Examiner finds Credelle discloses the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104 are the same, which the Examiner maps to the limitation "a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length" recited in claim 11. Final Act. 4 (citing Credelle, Fig. 18A); Ans. 5 (citing Credelle, Fig. 18A). The Examiner finds Credelle discloses a shortest distance between blue pixels 102 is longer than the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104, and a shortest distance between each of green pixels 106 and red pixels 105, which the Examiner maps to the limitation "a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels" recited in claim 11. Final Act. 4 (citing Credelle, Fig. 18A); Ans. 5, 14–15 (citing Credelle, Figs. 18A, 18B).

Appellant argues it is unclear how some vague distance could be interpreted reasonably as specifically providing "a same first length," "a second length that is longer than the first length," and a third length corresponding to "a shortest distance between each of the second pixels and the third pixels" such that the second length is also longer than the third length. Appeal Br. 6; Reply Br. 2. We agree with Appellant.

The cited portions of Credelle do not disclose any specific lengths. Credelle, Figs. 18A, 18B (cited at Final Act. 4; Ans. 5, 14–15). Nor does the Examiner provide sufficient explanation as to why the cited portions of Credelle inherently disclose "a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length" and "a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels" recited in claim 11.

Accordingly, we do not sustain the Examiner's rejection of claim 11 under 35 U.S.C. § 102(b).

II. Claims 1–5, 7–10, 12–14, and 17 Rejected Under 35 U.S.C. § 103

The Examiner finds Credelle teaches that other shapes and vertical offsets are possible. Ans. 16 (citing Credelle ¶¶ 27–28). The Examiner finds Kim teaches a green sub-pixel is larger than a red sub-pixel, which the Examiner maps to the limitation "wherein the second pixel has a larger area than that of the third pixel" recited in claim 11. Final Act. 7 (citing Kim, Fig. 3); Ans. 8 (citing Kim, Fig. 3). The Examiner finds an artisan would have been motivated at the time of the invention to combine Credelle's pixel arrangement with Kim's different sub-pixel sizes because the different sub-pixel sizes can correct white balance and the color coordinates. Final Act. 7; Ans. 8.

Appellant argues the combination of Credelle and Kim amounts to impermissible hindsight because Credelle teaches "displacements" of pixel arrangement structures and does not disclose, teach, or suggest modifying the sizes of the pixels and Kim teaches a pixel arrangement that is

structurally different from the pixel arrangement in Credelle. Appeal Br. 7–9; Reply Br. 3–4. We disagree with Appellant.

We disagree with Appellant's argument that a person having ordinary skill in the art would not combine the teachings of Credelle and Kim without using impermissible hindsight reconstruction. Appeal Br. 7–9; Reply Br. 3–4. Appellant has not provided persuasive evidence that combining the respective teachings of the references (as proffered by the Examiner — Final Act. 7; Ans. 8) would have been "uniquely challenging or difficult for one of ordinary skill in the art," or that such a combination would have "represented an unobvious step over the prior art." *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). Nor has Appellant provided any objective evidence of secondary considerations, which, as our reviewing court explains, "operate[] as a beneficial check on hindsight." *Cheese Systems, Inc. v. Tetra Pak Cheese and Powder Systems, Inc.*, 725 F.3d 1341, 1352 (Fed. Cir. 2013).

Moreover, Credelle teaches that other shapes and vertical offsets are possible; other shapes at least suggest different sizes because when a skilled artisan changes a shape, the response of changing the shape may alter the area or size. Credelle ¶¶ 27–28 (cited at Ans. 16). And we agree with the Examiner's finding that an artisan would have been motivated at the time of the invention to combine Credelle's system with Kim's different sub-pixel sizes because the different sub-pixel sizes can correct white balance and color coordinate. Final Act. 7; Ans. 8.

Appellant does not argue claims 2–5, 7–10, 12–14, and 17 separately with particularity, but asserts the rejections of those claims should be withdrawn for at least the same reasons as argued in independent claim 1.

Appeal Br. 7–9; Reply Br. 4. Accordingly, we sustain the Examiner's rejections of independent claim 1, and dependent claims 2–5, 7–10, 12–14, and 17, under 35 U.S.C. § 103.

We have only considered those arguments that Appellant actually raised in the Briefs. Arguments Appellant could have made, but chose not to make, in the Briefs have not been considered and are deemed to be waived. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2017).

CONCLUSION

Claim(s) Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
11	102(b)	Credelle		11
1–5, 12	103	Credelle, Kim	1–5, 12	
7–10, 14, 17	103	Credelle, Kim, Chao	7–10, 14, 17	
13	103	Credelle, Kim, Inuiya	13	
Overall Outcome			1–5, 7–10, 12–14, 17	11

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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(Not for submission under 37 CFR 1.99)

Application Number	13872018
Filing Date	2013-04-26
First Named Inventor	Sang-Shin Lee
Art Unit	2691
Examiner Name	YANG, KWANG-SU
Attorney Docket Number	072827/411598-01497

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	1	2007-156126	JP	A	2007-06-21	EPSON IMAGING DEVICES CORP	Abstract	
	2	2008-300367	JP	A	2008-12-11	SANYO ELECTRIC CO LTD	Abstract	
	3	2010-3880	JP	A	2010-01-07	SONY CORP	Abstract	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13872018
	Filing Date	2013-04-26
	First Named Inventor	Sang-Shin Lee
	Art Unit	2691
	Examiner Name	YANG, KWANG-SU
	Attorney Docket Number	072827/411598-01497

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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	Application Number	13872018
	Filing Date	2013-04-26
	First Named Inventor	Sang-Shin Lee
	Art Unit	2691
	Examiner Name	YANG, KWANG-SU
	Attorney Docket Number	072827/411598-01497

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jun-Young E. Jeon/	Date (YYYY-MM-DD)	2019-11-25
Name/Print	Jun-Young E. Jeon	Registration Number	43693

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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, 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.**

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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.

Electronic Acknowledgement Receipt

EFS ID:	37854695
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	25-NOV-2019
Filing Date:	26-APR-2013
Time Stamp:	17:37:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	72827_IDS.pdf	1041933 032a954f77974dea7fe617c1ed82258942d2ac33	no	4

Warnings:

Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Foreign Reference	JP_2007156126.pdf	9907062 75d26defc9a8f08be4fe20d2df9864627e8aad95	no	19
Warnings:					
Information:					
3	Foreign Reference	JP_2008300367.pdf	7214505 204bca4dcee7e092f986f309ddd7782417bff4b9	no	15
Warnings:					
Information:					
4	Foreign Reference	JP_2010003880.pdf	14552798 00b16d96c420de15984051422d1f927179a782bc	no	31
Warnings:					
Information:					
			Total Files Size (in bytes):	32716298	

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		7,110,031 B2	09-19-2006	Kondo et al.
		9,431,469 B2	08-30-2016	Park et al.
		2013/0106891 A1	05-02-2013	Matsueda et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office Action dated September 3, 2019, issued in U.S. Patent Application No. 16/261,437 (11 pages)
		U.S. Office Action dated October 25, 2019, issued in U.S. Patent Application No. 16/505,536 (14 pages)

EG 109756297.1-*-11/15/2019 12:07 PM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

PCH/eg

Electronic Acknowledgement Receipt

EFS ID:	37770382
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Peter C. Hsueh/Elizabeth Gomez
Filer Authorized By:	Peter C. Hsueh
Attorney Docket Number:	072827/411598-01497
Receipt Date:	15-NOV-2019
Filing Date:	26-APR-2013
Time Stamp:	17:47:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_IDS.PDF	123032 0c0d5c7afdf9e65ac3bd8939a2afd82f93495629	yes	3

	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Non Patent Literature	09_03_2019_OA_167080.pdf	427108 c90d6e96d84bef734804f09f8366f243cde02da5	no	11
Warnings:					
Information:					
3	Non Patent Literature	10_25_2019_OA_174060.pdf	437195 59f530222d259e36f913f243b2d190eb2777e1d8	no	14
Warnings:					
Information:					
		Total Files Size (in bytes):	987335		

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on November 15, 2019 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Elizabeth Gomez

Inventor(s) : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : KWANG-SU YANG

Docket No. : 072827

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
November 15, 2019

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. Copies of each of the listed Other Documents references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Peter C. Hsueh
Reg. No. 45,574
626/795-9900

PCH/eg
Enclosures: Information Disclosure Statement, w/references
EG 109756029.1-*-11/15/2019 11:48 AM

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		20020140833-A1	10-03-2002	Hirai
		20110291549-A1	12-01-2011	Kim et al.
		20130002911-A1	01-03-2013	Miyashita et al.

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		Office action issued in U.S. Application No. 15/811,599 by the USPTO, dated July 19, 2019, 19 pages.

109103141_1

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/rl

Electronic Acknowledgement Receipt

EFS ID:	37032003
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Rose Liu
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	30-AUG-2019
Filing Date:	26-APR-2013
Time Stamp:	13:37:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	IDS.pdf	131269 d82a5b3a8996219cfdfd1ae44448c7681132a2d7	no	2

Warnings:

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	SB08.pdf	117768 b0647bde2c03a0dd0c8b979222632ba67ff37721	no	1
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Non Patent Literature	15811599OANPL.pdf	585555 91965176b50346a2f4054c8fd79ea6d0f5023502	no	19
Warnings:					
Information:					
			Total Files Size (in bytes):	834592	

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on August 30, 2019 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

/Rose Liu/
Rose Liu

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: KWANG-SU YANG	
Docket No.	: 072827	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
August 30, 2019

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. A copy of the listed Other Documents reference is enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By /Jun-Young E. Jeon/
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/rl
Enclosures: Information Disclosure Statement, w/reference

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	YANG, KWANG-SU

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		2012/0049726 A1	03-01-2012	Yoo et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		KR 10-2009-0049515 A	05-18-2009	Samsung Display Co., Ltd.	Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

108839787_1

Electronic Acknowledgement Receipt

EFS ID:	36749856
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Rachel Villalobos
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	31-JUL-2019
Filing Date:	26-APR-2013
Time Stamp:	23:16:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		072827_IDS.pdf	258350 908dfdc279a3d722a932dccf88e6388d1f230c8b	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3
Warnings:			
Information:			

2	Foreign Reference	KR1020090049515.pdf	4990786 620be290640851d8a48f1c4e77fbe6e8806130d1	no	36
Warnings:					
Information:					
		Total Files Size (in bytes):	5249136		

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.

New Applications Under 35 U.S.C. 111
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.
National Stage of an International Application under 35 U.S.C. 371
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.
New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on July 31, 2019 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

/Rachel A. Villalobos/
Signature

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: YANG, KWANG-SU	
Docket No.	: 072827	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
July 31, 2019

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. Copies of each of the listed Foreign Patent Documents and Other Documents references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

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Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By /Jun-Young E. Jeon/
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/rav
Enclosures: Information Disclosure Statement, w/references

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	YANG, KWANG-SU

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		EP 2 637 209 A1	09-11-2013	Samsung Display Co., Ltd.	

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		EPO Communication Pursuant to Article 94(3) EPC, for Patent Application No. 13 178 648.5, mailed January 31, 2019, 8 pages.

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

107409743_1

JEJ/rav

Electronic Acknowledgement Receipt

EFS ID:	35219548
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Rachel Villalobos
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	21-FEB-2019
Filing Date:	26-APR-2013
Time Stamp:	21:22:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		072827_IDS.pdf	255391 e106d243fb75bc105b9ce70e4e6d9523f0915e2d	yes	3

	Multipart Description/PDF files in .zip description				
	Document Description	**Start**	**End**		
	Transmittal Letter	1	2		
	Information Disclosure Statement (IDS) Form (SB08)	3	3		
Warnings:					
Information:					
2	Foreign Reference	EP2637209A1.pdf	513598 470986cee7cc6b8f05bead5358b925c8d71881a8	no	14
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	EuropeanOA_13178648-5_2019-01-31.pdf	742096 938beb36f2427665c0f3b57485e992d106d79906	no	8
Warnings:					
Information:					
		Total Files Size (in bytes):	1511085		

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on February 21, 2019 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

/Rachel A. Villalobos/
Signature

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: YANG, KWANG-SU	
Docket No.	: 072827	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
February 21, 2019

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. Copies of each of the listed Foreign Patent Documents and Other Documents references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By /Jun-Young E. Jeon/
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/rav
Enclosures: Information Disclosure Statement, w/references

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2003-203770 A	07-18-2003	TOSHIBA CORP	Japan Patent Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EG 107054100.1-*-01/14/2019 1:09 PM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/eg

Electronic Acknowledgement Receipt

EFS ID:	34850669
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	14-JAN-2019
Filing Date:	26-APR-2013
Time Stamp:	18:55:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_IDS.PDF	130478 f6e2408ce3c68d5f73ec79c9bbaa8822d926f67f	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3
Warnings:			
Information:			

2	Foreign Reference	JP_2003203770.pdf	5289754 6392c30445e185dddf0e2879a4728dc9acc3859f	no	8

Warnings:	
Information:	
Total Files Size (in bytes):	5420232

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.

New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on January 14, 2019 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Elizabeth Gomez

Inventor(s) : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : KWANG-SU YANG

Docket No. : 072827

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
January 14, 2019

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing a reference that is known to applicant. A copy of the listed reference is enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed reference be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/eg
Enclosures: Information Disclosure Statement, w/reference

EG 107054075.1-*-01/14/2019 12:11 PM

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2006-18195 A	01-19-2006	JAPAN BROADCASTING CORP	Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EG 106757855.1-*-12/07/2018 10:40 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/eg

Electronic Acknowledgement Receipt

EFS ID:	34522569
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	07-DEC-2018
Filing Date:	26-APR-2013
Time Stamp:	15:57:39
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_IDS.PDF	99494 a6806fef0d05ad6e0c48012550c7bc8d0f809746	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3

Warnings:					
Information:					
2	Foreign Reference	JP_2006018195.pdf	7002270 201fcb670e1a01b1187dc9d4a58c845e9c0b0c69	no	14
Warnings:					
Information:					
		Total Files Size (in bytes):	7101764		

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.

New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
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New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on December 7, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Elizabeth Gomez

Inventor(s) : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : KWANG-SU YANG

Docket No. : 072827

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
December 7, 2018

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing a reference that is known to applicant. A copy of the listed reference is enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

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Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/eg
Enclosures: Information Disclosure Statement, w/reference
EG 106757728.1-*-12/07/2018 10:37 AM

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 12/20/2018

SBROWN2 SALE #00000003 Mailroom Dt: 12/07/2018 031728 13872018
01 FC : 1806 240.00 DA

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		4,642,619	02-10-1987	Togashi

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 3-36239	05-30-1991	Togashi	Corresponds to U.S. 4,642,619, listed above

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EG 106382147.1-*-10/26/2018 2:28 PM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/eg

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on October 26, 2018 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Elizabeth Gomez

Inventor(s) : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : KWANG-SU YANG

Docket No. : 072827

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
October 26, 2018

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. A copy of the listed Foreign Patent Documents reference is enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

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Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/eg
Enclosures: Information Disclosure Statement, w/references

EG 106382118.1-*-10/25/2018 2:57 PM

Electronic Acknowledgement Receipt

EFS ID:	34133939
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	26-OCT-2018
Filing Date:	26-APR-2013
Time Stamp:	17:48:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_IDS.PDF	100332 416e001d4ae30137049ff7e65c91d1d37623f450	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Information Disclosure Statement (IDS) Form (SB08)	3	3
	Transmittal Letter	1	2

Warnings:					
Information:					
2	Foreign Reference	JP_03036239.pdf	1123573 06571468c212e69780d4b4663a0a0c66d3c848b7	no	4
Warnings:					
Information:					
		Total Files Size (in bytes):	1223905		

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.

New Applications Under 35 U.S.C. 111

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National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

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Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 12/20/2018

SBROWN2 SALE #00000002 Mailroom Dt: 10/26/2018 031728 13872018
01 FC : 1806 240.00 DA

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		2004/0246426 A1	12-09-2004	Wang et al.
		2013/0057521 A1	03-07-2013	Kim

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office Action dated July 11, 2018, issued in U.S. Patent Application No. 15/811,599 (19 pages)

EG 105561846.1-*-07/25/2018 10:21 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Elizabeth Gomez

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: KWANG-SU YANG	
Docket No.	: 072827	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
July 25, 2018

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. A copy of the listed Other Documents reference is enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/eg
Enclosures: Information Disclosure Statement, w/references

EG 105561814.1-*-07/24/2018 2:03 PM

Electronic Acknowledgement Receipt

EFS ID:	33278724
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	25-JUL-2018
Filing Date:	26-APR-2013
Time Stamp:	13:41:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_IDS.PDF	134422 533971754ff28deb04e8c0ccdadee8c683f17072	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Information Disclosure Statement (IDS) Form (SB08)	3	3
	Transmittal Letter	1	2

Warnings:					
Information:					
2	Non Patent Literature	07_11_2018_OA_146816.pdf	562584 07a090b8bdbee468ca4641c49d50bf725bc5693d	no	19
Warnings:					
Information:					
		Total Files Size (in bytes):	697006		

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New Applications Under 35 U.S.C. 111
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.
National Stage of an International Application under 35 U.S.C. 371
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New International Application Filed with the USPTO as a Receiving Office
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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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	072827/411598-01497	4833

23363 7590 04/04/2018
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
04/04/2018	ELECTRONIC

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pair_cph@firsttofile.com

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LEWIS ROCA ROTHGERBER CHRISTIE LLP
PO BOX 29001
GLENDALE, CA 91209-9001

Appeal No: 2018-004596
Application: 13/872,018
Appellant: Sang-Shin Lee et al.

Patent Trial and Appeal Board Docketing Notice

Application 13/872,018 was received from the Technology Center at the Board on April 02, 2018 and has been assigned Appeal No: 2018-004596.

In all future communications regarding this appeal, please include both the application number and the appeal number.

The mailing address for the Board is:

PATENT TRIAL and APPEAL BOARD
UNITED STATES PATENT AND TRADEMARK OFFICE
P.O. BOX 1450
ALEXANDRIA, VIRGINIA 22313-1450

Telephone inquiries can be made by calling 571-272-9797 and referencing the appeal number listed above.

By order of the Patent Trial and Appeal Board.

DAG

PATENT

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Anita G. Johnson

Inventor(s)	:	Sang-Shin Lee	Confirmation No. 4833
Application No.	:	13/872,018	
Filed	:	April 26, 2013	
Title	:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	:	2691	
Examiner	:	Kwang-Su Yang	
Docket No.	:	072827	

APPELLANT'S REPLY BRIEF IN RESPONSE TO EXAMINER'S ANSWER

Mail Stop Appeal Brief-Patents
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P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
March 30, 2018

Commissioner:

This is in response to the January 30, 2018, Examiner's Answer to the October 11, 2017, Appeal Brief appealing the May 11, 2017, Final Rejection. Appellant's arguments begin on the following page.

ARGUMENTS

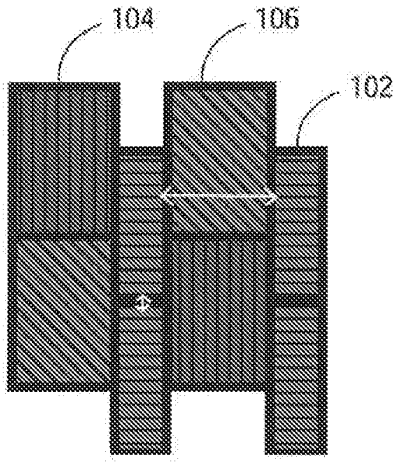
In the "Response to Arguments" section of the Examiner's Answer, section a, the Examiner states that "[a]djacent pixels should have some distance between them such as an (insulating) gap between them." Examiner's Answer, page 14. However, the Examiner has still not provided any evidentiary support for this proposition.

Nonetheless, assuming *arguendo* that adjacent pixels are required to have some distance between them (a point which Appellant does *not* concede), Credelle would still not disclose the specific pixel separation distances recited in claim 11. The Examiner states that gaps between pixels are illustrated "as [the] white region in Fig. 1 and [the] black region in Figs. 18A and 18B in Credelle", and that "[t]he gap represents the shortest distance, which is measured based on edges of the adjacent pixels to quantify distances between pixels". Examiner's Answer, pages 14-15. However, Appellant believes that this method of quantifying distances between pixels shows that Credelle teaches gaps having the same distances for each of "a shortest distance between the first pixel and the second pixel" (i.e., a blue pixel 102 and a green pixel 106), "a shortest distance between the first pixel and the third pixel" (i.e. a blue pixel 102 and a red pixel 104), "a shortest distance between the first pixels" (i.e., two blue pixels 102), and "a shortest distance between each of the second pixels and the third pixels" (i.e., a red pixel 104 and a green pixel 106) in each of FIGS. 1, 18A, and 18B. Appellant notes that the distances between pixels in Credelle may appear to vary depending on whether the figures are reviewed in electronic or paper format. Appellant submits that the electronic format provides better line resolution, and therefore, is more accurate.

Credelle does not appear to disclose or provide any distances, whether numerical or relative, between pixels within the text of the specification. As such, the recited pixel separation distances do not appear to be anticipated. Furthermore, Credelle does not appear to disclose or even suggest a reason for selecting *any* particular set of pixel separation distances. As such, the notion that Credelle discloses or even suggests the distances between pixels recited in claim 11 appears to be

unsupported. Accordingly, the recited pixel separation distances do not appear to be obvious.

The Examiner also asserts that in Credelle, the shortest distance between the blue pixels is greater than the gap between the red and green pixels, the shortest distance between the blue pixels is the distance indicated by the white arrow (the arrow extending in the vertical direction), not the distance indicated by the yellow arrow (the arrow extending in the horizontal direction) in the figure below. Thus, the shortest distance between the blue pixels is not greater than the gap between the red and green pixels.



In the first part of section b, the Examiner states that "Credelle teaches that it should be appreciated that other shapes to the subpixels are also possible" and that "other vertical offset are also possible" as support for the proposition that Credelle contemplates changes in size. Examiner's Answer, page 16. However, Appellant notes that shape and position are distinct characteristics from size (e.g., area); as such, the Examiner's argument appears to overreach. Indeed, changing the relative sizes of the pixels would affect the color balance of the display. Credelle does not appear to approach this issue, and again does not appear to contemplate changing pixel sizes.

In the second part of section b, the Examiner states that "Credelle teaches that pixels are designated as 'first', 'second', and 'third' pixels (the blue pixel 102, the green pixel 106, and the red pixel 104; Fig. 18A)" and that "Kim teaches that the second pixel (the green pixel 106) has a larger area than that of the third pixel". Examiner's Answer, page 16. However, Appellant notes that the term "first pixel", "second pixel", etc. do not appear in either Credelle or Kim, and as such, appear to be arbitrarily designated by the Examiner. Therefore, Appellant maintains that it would not have been possible for one having ordinary skill in the art at the time the invention was made to clearly decide which of the pixels in Credelle should correspond to the pixels in Kim unless that ordinary artisan had the benefit of using the present claims as a template, which amounts to impermissible hindsight.

Finally, because claims 2-5, 7-10, 12-14, and 17 each depend, directly or indirectly, from claim 1, they each incorporate all the terms and features of claim 1 in addition to other features, which together further patentably distinguish the claim over the cited references. Accordingly, in light of the above remarks, and those in Appellant's Appeal Brief, Appellant submits that all of the pending claims 1-5, 7-14, and 17 are in condition for allowance. Accordingly, Appellant requests that the rejections of these claims be reversed.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Justin O. Ehresmann, Ph.D.
Reg. No. 73,867
626/795-9900

JOE/joe
AGJ 10289104 7.2-* 08/30/2018 12:33 PM

Electronic Acknowledgement Receipt

EFS ID:	32212601
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Justin O. Ehresmann/Anita Johnson
Filer Authorized By:	Justin O. Ehresmann
Attorney Docket Number:	072827/411598-01497
Receipt Date:	30-MAR-2018
Filing Date:	26-APR-2013
Time Stamp:	17:23:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	72827-Transmittal-Appellants-Reply-Brief-3-30-18-Filed.PDF	12801 9f04e3d392284ea4e9ddd5089e916c1ce6f48cd3	no	1

Warnings:

Information:					
2	Reply Brief Filed	72827-Reply-Brief-3-30-18-Filed.PDF	714892 a13467a859713a0858ac4a21cfaaa95ed31ff544	no	4
Warnings:					
Information:					
		Total Files Size (in bytes):	727693		

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New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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PATENT

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Anita G. Johnson

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2961	
Examiner	: Kwang-Su Yang	
Docket No.	: 072827	

SUBMISSION OF APPELLANT'S REPLY BRIEF (§ 1.193(B)) TO THE PATENT TRIAL AND APPEAL BOARD

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Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
March 30, 2018

Commissioner:

Enclosed for filing is the Appellant's Reply Brief for this application.

__X__ An appeal forwarding fee of $2,000 was previously submitted on October 11, 2017 with Appellant's Brief.

The Commissioner is hereby authorized to charge any further fees under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By
Justin O. Ehresmann, Ph.D.
Reg. No. 73,867
626/795-9900

JOE/agj
AGJ 104538522.1-*-03/30/2018 11:34 AM

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	KWANG-SU YANG

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE
		9,837,476 B2	12-05-2017	Park et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2004-179028 A	06-24-2004	Takahashi	Japan Patent Abstract
		JP 2005-5227 A	01-06-2005	Kawachi et al.	Japan Patent Abstract
		JP 2010-153173 A	07-08-2010	Ikeda et al.	Japan Patent Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office Action dated March 19, 2018, issued in U.S. Patent Application No. 15/688,760 (13 pages)

EG 104509760.1-*-03/28/2018 11:06 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

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PATENT

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Elizabeth Gomez

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: KWANG-SU YANG	
Docket No.	: 072827	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
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March 28, 2018

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. Copies of each of the listed Foreign Patent Documents and Other Documents references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

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Enclosures: Information Disclosure Statement, w/references

EG 104509229.1-*-03/28/2018 10:54 AM

Electronic Acknowledgement Receipt

EFS ID:	32187749
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	072827/411598-01497
Receipt Date:	28-MAR-2018
Filing Date:	26-APR-2013
Time Stamp:	17:47:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_IDS.PDF	114929 9f22711930aefda59396fe0e98652885523a5659	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Information Disclosure Statement (IDS) Form (SB08)	3	3
	Transmittal Letter	1	2

Warnings:					
Information:					
2	Foreign Reference	JP_2004179028.pdf	8169835 b628305a41c767c77e7791fbc1d3885604bfc71f	no	19
Warnings:					
Information:					
3	Foreign Reference	JP_2005005227.pdf	17859426 6fd3dceab315e1b9bb022ae1cfd9be407e14681d	no	33
Warnings:					
Information:					
4	Foreign Reference	JP_2010153173.pdf	17954499 5890c0dd49353b04cab737098e382c3d63f46ba5	no	37
Warnings:					
Information:					
5	Non Patent Literature	03_19_2018_OA_143931.pdf	495583 548cc505228d3fe8476706f345d1ba6d29d52b44	no	13
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		Total Files Size (in bytes):	44594272		

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New Applications Under 35 U.S.C. 111

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New International Application Filed with the USPTO as a Receiving Office

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 01/30/2018
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
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pair_cph@firsttofile.com

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
13/872,018	26 April, 2013	LEE, SANG-SHIN	72827/S1437

Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

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ART UNIT	PAPER
2691	20180118-A

DATE MAILED:

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Commissioner for Patents

The references cited in the PTO-1449 filed on 07/14/2007 and 11/02/2017 have been considered.

Attachment: Information Disclosure Statements

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

PTO-90C (Rev.04-03)

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 13/872,018
Filing Date: April 26, 2013
Appellant(s): Sang-Shin Lee

Justin O. Ehresmann
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/11/2017.

(1) Grounds of Rejection to be Reviewed on Appeal

Every ground of rejection set forth in the Office action dated 05/11/2017 from which the appeal is taken is being maintained by the Examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

The following grounds of rejection are applicable to the appealed claims.

Claim Rejections - 35 USC § 103

Claim Warning

1. Applicant is advised that should claim 8 be found allowable, claim 9 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, **i.e., a limitation "wherein the second pixel has a larger area than that of the third pixel" in claim 1 which is a parent claim of claim 8 and a limitation "wherein each of the second pixels is larger in area than each of the third pixels" in claim 9 which is a child claim of claim 8**, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 11 is rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Credelle (U.S. Pub. No. US 2003/0128179 A1).

As to claim 1, Credelle (Figs. 1, 18A and 20) teaches **a pixel arrangement structure** (an octal subpixel grouping; Fig. 18A) **of an organic light emitting diode (OLED) display** (a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14)**, comprising:**

- **a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display** (blue subpixel 102, red subpixel 104, and green subpixel 106; a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14; Fig. 18A) **and comprising:**
- **a first pixel** (a blue subpixel 102) **having a center coinciding with a center of a virtual square** (a virtual square consists of centers of two red subpixels and two green subpixels; Fig. 18A**;**
- **another first pixel** (a blue subpixel in a first row and a fourth column) **having a center coinciding with a center of another virtual square** (another virtual square consists of two green subpixels and two red subpixels; Fig. 18A)**, the virtual squares sharing a common side having endpoints at a common first vertex** (a center of the green subpixel 106 in a first row and a third column) **and a common second vertex** (a center of the red subpixel 104 in a second row and a third column) **of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to**

pixels configured to emit different color light (red subpixel 104 and green subpixel 106 are located alternately in neighboring vertices in each virtual square; Fig. 18A)**;**

- **a second pixel** (green subpixel in a first row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and having a center at the first vertex** (the center of the green subpixel in a first row and a third column) (Figs. 1 and 18A)**; and**

- **a third pixel** (red subpixel in a second row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and the second pixel** (the green subpixel in a first row and a third column)**, and having a center at the second vertex** (a center of the red subpixel in a second row and a third column) (Figs. 1 and 19A)~~,~~

- **the first pixel, the second pixel, and the third pixel have polygonal shapes** (rectangular shapes; Figs. 1 and 18A)**,**

- **a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length** (the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104 are same; Fig. 18A)**, and**

- **a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels** (a shortest distance between blue pixels 102 is longer than the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104, i.e., a same first length in the above limitation, and a shortest distance between each of green pixels 106 and red pixels 104; Fig. 18A)**.**

Claim Rejections - 35 USC § 103

4. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5 and 12 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle in view of Kim (U.S Pub. No. US 2004/0183764 A1).

As to claim 1, Credelle (Figs. 1, 18A and 20) teaches **a pixel arrangement structure** (an octal subpixel grouping; Fig. 18A) **of an organic light emitting diode (OLED) display** (a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14)**, comprising:**

- **a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display** (blue subpixel 102, red subpixel 104, and green subpixel 106; a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14; Fig. 18A) **and comprising:**
- **a first pixel** (a blue subpixel 102) **having a center coinciding with a center of a virtual square** (a virtual square consists of centers of two red subpixels and two green subpixels; Fig. 18A)**;**
- **another first pixel** (a blue subpixel in a first row and a fourth column) **having a center coinciding with a center of another virtual square** (another virtual square consists of two green subpixels and two red subpixels; Fig. 18A)**, the virtual squares sharing a common side having endpoints at a common first vertex** (a center of the

green subpixel 106 in a first row and a third column) **and a common second vertex** (a center of the red subpixel 104 in a second row and a third column) **of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light** (red subpixel 104 and green subpixel 106 are located alternately in neighboring vertices in each virtual square; Fig. 18A)**;**

- **a second pixel** (green subpixel 106 in a first row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and having a center at the first vertex** (the center of the green subpixel in a first row and a third column) (Figs. 1 and 18A)**;**
- **an other first pixel** (a blue subpixel above the subpixel at the first row and the second column) **on a line defined by the center of the virtual square** (the center of the blue subpixel at the first row and the fourth column) **and the first vertex** (the center of green subpixel 106 in the first row and the third row)**, the first pixel** (the blue subpixel in the first row and the fourth column)**, the second pixel** (the green subpixel 106 in the first row and the third column)**, and the other first pixel** (the blue subpixel above the subpixel at the first row and the second column) **being consecutive pixels on the line** (Fig. 18A)**; and**
- **a third pixel** (red subpixel in a second row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and the second pixel** (the green subpixel in a first row and a third column)**, and having a center at the second vertex** (a center of the red subpixel in a second row and a third column) (Figs. 1 and 19A)~~,~~
- **wherein the second pixel and the third pixel have polygonal shapes** (rectangular shapes; Fig. 18A)**.**

Credelle does not teach **wherein the second pixel has a larger area than that of the third pixel.**

Kim (Fig. 3) teaches

- **wherein the second pixel has a larger area than that of the third pixel** (the size of a green sub-pixel is larger than that of a red sub-pixel; Fig. 3; the present invention is applicable not only to a plasma display but also to a flat panel display (FPD) such as an organic electro luminescence display (OLED) or a liquid crystal display; [0060], lines 7-10)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different sub-pixel sizes as taught by Kim in a subpixel grouping of Credelle because the different sub-pixel sizes can correct the white balance and the color coordinate.

As to claim 2, Credelle teaches

- **wherein the second pixel comprises a pair of second pixels** (a green subpixel in a first row and a third column and a green subpixel in a second row and a first column; Fig. 18A)**, and the second pixels are separated from each other by the first pixel** (the green subpixel in a first row and a third column and the green subpixel in a second row and a first column are separated by the blue subpixel in a first row and a second column) (Figs. 1 and 18A)**.**

As to claim 3, Credelle teaches

- **wherein the third pixel comprises a pair of third pixels** (a red subpixel in a second row and a third column and a red subpixel in a first row and a first column; Fig. 18A)**, and the third pixels are separated from each other by the first pixel** (the red

subpixel in a second row and a third column and the red subpixel in a first row and a first column are separated by the blue subpixel in a first row and a second column) (Figs. 1 and 18A).

As to claim 4, Credelle teaches

- **wherein the second pixel comprises a pair of second pixels** (a green subpixel in a first row and a third column and a green subpixel in a second row and a first column; Fig. 18A)**, the third pixel comprises a pair of third pixels** (a red subpixel in a second row and a third column and a red subpixel in a first row and a first column; Fig. 18A)**, and the second pixels and the third pixels enclose the first** pixel (the blue subpixel in a first row and a second column) **in the virtual square** (Figs. 1 and 18A).

As to claim 5, Credelle teaches

- **wherein each of the second pixels and the third pixels is larger in area than the first pixel** (green pixels 106 and red pixels 104 is larger in size than blue pixels 101; Fig. 18A).

As to claim 12, Credelle teaches

- **wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light** (blue, green and red color; Figs. 1 and 18A).

6. Claims 7-10, 14 and 17 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle, in view of Kim as applied to claim 1 above, and further in view of Chao (U.S. Pub. No. US 2008/0001525 A1).

As to claim 7, Credelle and Kim teach **the pixel arrangement structure of**

claim 5.

Credelle and Kim do not teach **wherein one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape** (each of the red, green, and blue light emission **zones** 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle as modified by Koyama because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 8, Kim teaches **wherein**

- **the first pixels are symmetrical to each other** (the blue sub-pixels are symmetric to each other; Fig. 18A)**.**

As to claim 9, Kim teaches **wherein**

- **each of the second pixels is larger in area than each of the third pixels** (the size of a green sub-pixel is larger than that of a red sub-pixel; Fig. 3; the present invention is applicable not only to a plasma display but also to a flat panel display (FPD)

such as an organic electro luminescence display (OLED) or a liquid crystal display; [0060], lines 7-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different sub-pixel sizes as taught by Kim in a subpixel grouping of Credelle as modified by Chao because the different sub-pixel sizes can correct the white balance and the color coordinate.

As to claim 10, Kim teaches **wherein**

- **a shortest distance between the first pixel and the second pixels as well as a shortest distance between the first pixel and the third pixel is a same first length** (the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104 are same; Fig. 18A).

As to claim 14, Credelle and Kim teach **the pixel arrangement structure of claim 5.**

Credelle and Kim do not teach **wherein at least one of the second pixel and the third pixel has hexagonal shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **at least one of the second pixel and the third pixel has a hexagonal shape** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle, circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle as modified by Kim

because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 17, Credelle and Kim teach **the pixel arrangement structure of claim 1.**

Credelle and Kim do not expressly teach **wherein the second pixel has a different polygon shape from the third pixel.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches

- **wherein the second pixel has a different polygon shape from the third pixel** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle as modified by Kim because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

7. Claim 13 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle, in view of Kim as applied to claim 1 above, and further in view of Inuiya (U.S. Patent No. US 6,882,364 B1).

As to claim 13, Credelle and Kim teach **the pixel arrangement structure**

of claim 1.

Credelle and Kim do not expressly teach **wherein the first pixel is configured to emit green light, one of the second pixel and the third pixel is configured to emit blue light, and another of the second pixel and the third pixel is configured to emit red light.**

Inuiya (Figs. 1-16) teaches **wherein**

- **the first pixel is configured to emit green light** (a primary color G)**, one of the second pixel and the third pixel is configured to emit blue light** (a primary color B)**, and another of the second pixel and the third pixel is configured to emit red light** (a primary color R) (Fig. 6 and a honeycomb pattern in Fig. 7B)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a honeycomb pattern as taught by Inuiya in a subpixel grouping of Credelle as modified by Chao because it is possible to arrange the pixels more densely than with the square lattice arrangement.

Response to Arguments

8. Applicant's arguments filed 04/14/2017 have been fully considered but they are not persuasive.

As to claim 11, Applicant argues that the distance between the first (blue) pixels and the distance between the first (blue) and second (green) pixels or the first (blue) and third (red) pixels are **0**. However, the Office respectfully disagrees. Adjacent pixels in a display panel should have some distance between them such as an insulating gap between them.

Applicants' arguments with respect to claims 1-5, 7-10, 12-14 and 17 have been considered but are moot in view of the new grounds of rejection.

In view of amendment, references of Credelle, Kim, Chao and Inuiya have been used for the new grounds of rejection.

Therefore, the Office maintains the rejections as recited above.

Examiner's Response:

a. Response to an argument: Appellant traverses the 102(b) rejection of claim 11.

The Appellant argues that the 102(b) rejection should be reversed since claim 11 recites distances between pixels and Credelle does not appear to quantify distances between pixels.

The Examiner believes that the limitations "**a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length, and a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels"** read on the reference Credelle. Adjacent pixels in a display panel should have some distance between them such as an (insulating) gap between them. The **gap** among blue pixel 102, corresponding to a first pixel, green pixel 106, corresponding to a second pixel, and red pixel 104, corresponding to a third pixel, is illustrated as white region in Fig. 1 and black region Figs. 18A and 18B in **Credelle**. The gap represents the shortest distance, which is measured based on edges

of the adjacent pixels to quantify distances between pixels, for a first length and the shortest distance between each of the second pixels and the third pixels in the above limitations. Credelle clearly teaches that **a shortest distance** (a gap) **between the fist pixe**l (the blue pixel 102) **and the second pixel** (the green pixel 106) **as well as the shortest distance** (the gap) **between the first pixel** (the blue pixel 102) **and the third pixel** (the red pixel 104) **is a same length** (Fig. 18A). Credelle also teaches that **a shortest distance** (two gaps and the width of either the blue pixel 106 or the red pixel 104) **between the first pixels** (two blue pixels 102) **is a second length that is longer than the first length** (the gap) **and a shortest distance** (the gap) **between each of the second pixels** (the green pixel 106) **and the third pixels** (the red pixel 104) (Fig. 18A)**.**

b. Response to an argument: Combining Kim with Credelle requires arbitrary designation of "first," "second," and "third" pixels in Kim, which amounts to impermissible hindsight and the remaining references do not cure deficiencies of Credelle and Kim for the 103(a) rejections of claims 1-5, 7-12, 13-14 and 17**.**

As to claim 1, the Appellant argues that there is no apparent reason why a person having ordinary skill in the art at the time when the present invention was made would have arrived at the feature of "**wherein the second pixel has a larger area than that of the third pixel**" from the disclosure of Credelle, even in view of Kim.

The Appellant argues that Credelle does not appear to disclose, teach, or even suggest modifying the sizes of pixels (page 7, 4th paragraph, lines 8-10 in Appeal Brief).

However, Credelle teaches that it should be appreciated that other shapes to the subpixels are also possible and are contemplated with the scope of the present invention, for example, a multitude of other regular or irregular shapes for the subpixels are possible and are desirable if manufacturable (0027], lines 2-6; Fig. 1) and other vertical offsets are also possible ([0028], lines 1-8; Fig. 18A) for modifying the shapes of the subpixels, i.e., the size of the pixels.

The Appellant also argues that Kim does not designate any of the disclosed pixels as "first," "second," and "third" pixels, as defined in the present claims.

However, Credelle teaches that pixels are designated as "first," "second," and "third" pixels (the blue pixel 102, the green pixel 106, and the red pixel 104; Fig. 18A). The second pixel and the third pixel in claim 1 are corresponding to the green pixel 106 and the red pixel 104, respectively, in Credelle. Kim teaches that **the second pixel** (the green pixel 106) **has a larger area than that of the third pixel** (the red pixel 104) (Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different sub-pixel sizes as taught by Kim in a subpixel grouping of Credelle because the different sub-pixel sizes can correct the white balance and the color coordinate.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of

ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

As to claims 2-5 and 12, the Appellant argues that these claims should be reversed since each of claims 2-5 and 12 depends, directly or indirectly, from claim 1 so that each incorporates all the terms and features of claim 1 in addition to other features, which together further patentably distinguish the claim over the cited references. The same reasoning as recited above for claim 1 is applied to claims 2-5 and 12.

As to claims 7-10, 13-14 and 17, the Appellant argues that the remaining references do not cure deficiencies of Credelle and Kim. The same reasoning as recited above for claim 1 is also applied to claims 7-10, 13-14 and 17.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/KWANG-SU YANG/
Patent Examiner, Art Unit 2691

Conferences:

/CHANH NGUYEN/
Supervisory Patent Examiner, Art Unit 2691

/Amare Mengistu/
Supervisory Patent Examiner, Art Unit 2623

Requirement to pay appeal forwarding fee. In order to avoid dismissal of the instant appeal in any application or ex parte reexamination proceeding, 37 CFR 41.45 requires payment of an appeal forwarding fee within the time permitted by 37 CFR 41.45(a), unless appellant had timely paid the fee for filing a brief required by 37 CFR 41.20(b) in effect on March 18, 2013.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		CN 101009304 A	08-01-2007	Zhao et al.	Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

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EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	01/18/2018

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

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EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 10-39791	02-13-1998	Nakamura et al.	Japan Patent Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

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EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	01/18/2018

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FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		CN 101449382 A	06-03-2009	Smith et al.	Abstract
		CN 103311266 A	09-18-2013	Lee	Abstract
		CN 203260586 U	10-30-2013	Lee	Abstract
		CN 105206647 A	12-30-2015	Lee	Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

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Electronic Acknowledgement Receipt

EFS ID:	31597911
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	24-JAN-2018
Filing Date:	26-APR-2013
Time Stamp:	18:39:20
Application Type:	Utility under 35 USC 111(a)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_IDS.PDF	114746 432dc5c1a8e80881fc4edc4d509a6d741e715d32	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3
Warnings:			
Information:			

2	Foreign Reference	CN_101449382.pdf	5211097 086e202be542d9a26f911f22632b4143eab44992	no	25
Warnings:					
Information:					
3	Foreign Reference	CN_103311266.pdf	3288698 cdfaeb6a13dc3f5b483060afcb52fed6c9823db5	no	16
Warnings:					
Information:					
4	Foreign Reference	CN_105206647.pdf	3240682 e0cc7663e8bdf609255298c70487174c3584e4a8	no	15
Warnings:					
Information:					
5	Foreign Reference	CN_203260586.pdf	3361755 15772357ed2dc674b8b56d93141572dff01707a0	no	16
Warnings:					
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		Total Files Size (in bytes):	15216978		

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New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Elizabeth Gomez

Inventor(s) : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Kwang-Su Yang

Docket No. : 072827

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
January 24, 2018

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. Copies of each of the listed Foreign Patent Documents references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/eg
Enclosures: Information Disclosure Statement, w/references

EG 103331949.1-*-01/24/2018 10:33 AM

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE OR ISSUE DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		CN 101009304 A	08-01-2007	Zhao et al.	Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EG 102734003.1-*-11/02/2017 8:47 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/eg

Electronic Acknowledgement Receipt

EFS ID:	30842515
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	02-NOV-2017
Filing Date:	26-APR-2013
Time Stamp:	17:38:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3
Warnings:			
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2	Foreign Reference	CN_101009304.pdf	1567341 8711d346589eb0b65281a359d6b12d51594fd9dd	no	20

Warnings:	
Information:	
Total Files Size (in bytes):	1599978

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New Applications Under 35 U.S.C. 111
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.
National Stage of an International Application under 35 U.S.C. 371
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.
New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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/Elizabeth Gomez/
Elizabeth Gomez

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 072827	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
November 2, 2017

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing a reference that is known to applicant. A copy of the listed reference is enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed reference be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/eg
Enclosures: Information Disclosure Statement, w/reference

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Document code: WFEE

United States Patent and Trademark Office
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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/Sherlin Yaghoubzadeh/
Sherlin Yaghoubzadeh

Inventor(s)	:	Sang-Shin Lee	Confirmation No. 4833
Application No.	:	13/872,018	
Filed	:	April 26, 2013	
Title	:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	:	2691	
Examiner	:	Yang, Kwang-Su	
Docket No.	:	072827	

APPELLANT'S BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
October 11, 2017

Commissioner:

1. REAL PARTY IN INTEREST

The real party in interest is Samsung Display Co., Ltd.

2. RELATED APPEALS AND INTERFERENCES

Appellant is not aware of any other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

3. SUMMARY OF CLAIMED SUBJECT MATTER

This appeal involves claims 1-5, 7-14, and 17 as submitted in the amendment dated April 14, 2017 and subsequently entered by the Examiner, of which claims 1 and 11 are independent. A concise explanation of the subject matter defined by independent claims 1 and 11 follows. The concise explanation is for the Board's convenience, as required by 37 CFR § 41.37(c)(1)(iii), and is not intended to and should not be used to interpret the language of claims 1 and 11 or to broaden or narrow the scope of claims 1 and 11. The Appellant has provided references to the specification and drawings as examples and for the Board's convenience, as required by 37 CFR § 41.37(c)(1)(iii), and they are not intended to and should not be interpreted to be a necessarily complete recitation of all instances in the specification and drawings relevant to the claim element(s) to which the references correspond. Similarly, the Appellant does not intend to imply that the references to the specification or drawings necessarily fall within or without the scope of the claim element(s) to which the references correspond.

Independent claim 1 is directed to a pixel arrangement structure of an organic light emitting diode (OLED) display, and recites, in part (***emphasis*** added):

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising (paragraphs [0009] and [0055]):

a ***first pixel*** having a center coinciding with a ***center of a virtual square*** (paragraphs [0011] and [0062] and FIG. 6);

another first pixel having a center coinciding with a center of another virtual square (paragraph [0038] and FIG. 6), the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light (paragraphs [0035] and [00110] and FIG. 6);

a ***second pixel*** separated from the first pixels and ***having a center at the first vertex*** (paragraphs [0011] and FIG. 6);

an other first pixel on a line defined by the center of the virtual square and the first vertex, the first pixel, the second pixel, and the other first pixel being consecutive pixels on the line (FIG. 6); and

a ***third pixel*** separated from the first pixels and the second pixel, and ***having a center at the second vertex*** (paragraph [0011] and FIG. 6),

wherein the second pixel and the third pixel have polygonal shapes (paragraph [0015] and FIG. 6), and

wherein the second pixel has a larger area than that of the third pixel (paragraph [0015] and FIG. 6).

Independent claim 11 is directed to a pixel arrangement structure of an organic light emitting diode (OLED) display, and recites, in part (***emphasis*** added):

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising (paragraphs [0009] and [0055]):

a first pixel having a center coinciding with a center of a virtual square (paragraphs [0011] and [0062] and FIG. 6);

another first pixel having a center coinciding with a center of another virtual square (paragraph [0038] and FIG. 6), the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light (paragraphs [0035] and [00110] and FIG. 6);

a second pixel separated from the first pixels and having a center at the first vertex (paragraphs [0011] and FIG. 6); and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex (paragraph [0011] and FIG. 6),

the first pixel, the second pixel, and the third pixel have polygonal shapes (paragraph [0015] and FIG. 6),

a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length (paragraph [0105] and FIG. 6), and

a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels (paragraph [0105] and FIG. 6).

4. ARGUMENT

Claims 1-5, 7-14, and 17 remain pending, of which claims 1 and 11 are independent. Claims 6, 15, and 16 were previously canceled without prejudice. Claims 1-5, 7-14, and 17 have been rejected and are appealed.

I. Summary of Rejections of Claim 11 under pre-AIA 35 U.S.C. § 102(b)

In the Final rejection dated May 11, 2017, the Examiner continued the rejection of independent claim 11 under pre-AIA 35 U.S.C. 102(b) as allegedly being anticipated by Credelle et al. (U.S. 2003/0128179).

In rejecting claim 11 over Credelle, the Examiner cites Credelle, FIG. 18A as showing "a shortest distance between blue pixels 102 is longer than the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104; i.e. a same first length in the above limitation." Final Rejection, page 4. The Examiner also states that "[a]djacent pixel[s] in a display panel should have some distance between them such as an insulating gap between them" (Final Rejection, page 13), but the Office action does not cite to any support for this statement. Indeed, the Examiner does not cite a specific portion of Credelle that discloses the recited pixel separation distances.

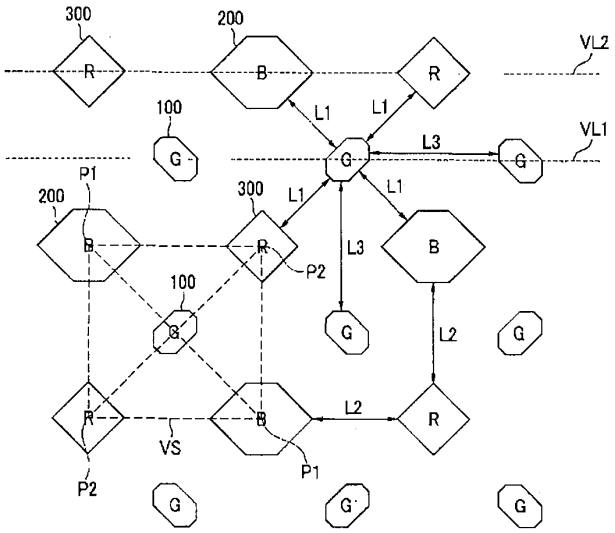
Appellant traverses the rejection of claim 11 for at least the following reasons.

A. Claim 11 Recites Distances *Between* Pixels

As an initial matter, Appellant notes that claim 11 recites distances ***between pixels***, rather than distances ***between pixel centers***. For example, claim 11 recites (***emphasis*** added), "a shortest distance ***between the first pixel and the second pixel*** as well as a shortest distance ***between the first pixel and the third pixel*** is a same first length," and "a shortest distance ***between the first pixels*** is a second length that is longer than the first length and a shortest distance ***between each of the second pixels and the third pixels***." Thus, claim 11 recites distances between pixels. Indeed, the distances recited in claim 11 can be informed by paragraph [0105] and FIG. 6 of the Specification.

Paragraph [0105] discloses, for example, an embodiment in which "the distance between one of the first pixels 100 and an adjacent one of the second pixels 200 as well as a distance between one of the first pixels 100 and an adjacent one of the third pixels 300 is the ***same first length L1***", and "a distance between neighboring first pixels 100 is ***a third length L3***" (***emphasis*** added).

FIG. 6 demonstrates that the distances *L1* and *L3* are both measured between the *edges* (e.g., borders) of the cited pixels. FIG. 6 is reproduced below for reference.



Appellant respectfully requests that the recitations of distances in claim 11 be interpreted in a manner consistent with the above.

B. Credelle Does Not Appear to Quantify Distances Between Pixels

Credelle does not appear to provide any *values*, relative or absolute, for the *distances* of any alleged insulating gaps between the edges of the blue, green, and red pixels. Indeed, the Examiner does not appear to cite to any portion of Credelle regarding the lengths of any such distances. Rather, the Examiner appears to vaguely refer to "some distance." Final Rejection, page 13. It is unclear how "some distance" could be reasonably interpreted as *specifically* providing "a same first length," "a second length that is longer than the first length," and a third length corresponding to "a shortest distance between each of the second pixels and the third pixels," such that the second length is also longer than the third length.

Therefore, as Credelle does not appear to actually disclose the specific pixel separation distances recited in claim 11, including "a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a ***same first length***, and a shortest distance between the first pixels is a ***second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels***," Credelle does not anticipate each and every feature of claim 11 (***emphasis*** added).

In addition, as Credelle does not appear to disclose or even suggest a reason for selecting *any* particular set of pixel separation distances, much less the recited set of distances, the recited pixel separation distances would also not have been obvious without impermissible hindsight.

Therefore, Appellant respectfully requests that the rejection of claim 11 be reversed, and that this claim be allowed.

II. Summary of Rejections of Claims 1-5, 7-12, 13-14, and 17 under pre-AIA 35 U.S.C. § 103(a)

In the Final rejection dated May 11, 2017, the Examiner continued the rejection of claims 1-5 and 12 under pre-AIA 35 U.S.C. 103(a) as allegedly being unpatentable over Credelle in view of Kim et al. (U.S. 2004/0183764). In addition, the Examiner continued the rejection of claim 13 under pre-AIA 35 U.S.C. 103(a) as allegedly being unpatentable over Credelle in view of Kim and Inuiya et al. (U.S. 6,882,364), as well as the rejections of claims 7-10, 14, and 17 under pre-AIA 35 U.S.C. 103(a) as allegedly being unpatentable over Credelle in view of Kim and Chao et al. (U.S. 2008/0001525).

In rejecting independent claim 1 over Credelle and Kim, the Examiner admits that "Credelle does not teach wherein the second pixel has a larger area than that of the third pixel." Final Rejection, page 7 (emphasis removed). However, the Examiner attempts to remedy the above-referenced deficiencies of Credelle by citing Kim for "the size of the green sub-pixel is larger than that of a red sub-pixel." Final Rejection, page 7.

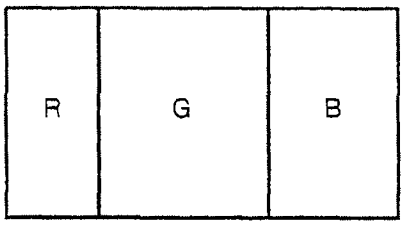
Appellant respectfully traverses this rejection for at least the following reasons.

A. Combining Kim with Credelle Requires Arbitrary Designation of "First," "Second," and "Third" Pixels in Kim, Which Amounts to Impermissible Hindsight

There is no apparent reason why a person having ordinary skill in the art at the time when the present invention was made would have arrived at the feature of "wherein the second pixel has a larger area than that of the third pixel" from the disclosure of Credelle, even in view of Kim. For example, Credelle discloses that the pixels positioned at neighboring vertices of adjacent virtual squares (which the Examiner cites for the recited second and third pixels) are the same size. *See* Credelle, FIG. 18A. With respect to these pixels, however, Credelle describes "displacements" of pixel arrangement structures, and does not appear to disclose, teach, or even suggest modifying the sizes of the pixels. *See, e.g.,* Credelle, paragraphs [0010], [0020], and [0021]. As such, one having ordinary skill in the art at the time when the present

invention was made would not have found motivation in Credelle to modify the sizes of the pixels such that the second pixel is larger than the third pixel.

The Examiner also states that Kim teaches the feature "wherein the second pixel has a larger area than that of the third pixel," because FIG. 3 of Kim shows "the size of a green sub-pixel is larger than that of a red sub-pixel." Final Rejection, page 7 (emphasis removed). Kim, however, shows a pixel arrangement structure in which the red, green, and blue pixels are arranged in a horizontal row. FIG. 3 of Kim is reproduced below for reference.



Kim, FIG. 3

This pixel arrangement is *structurally different* from the pixel arrangement disclosed in Credelle and the pixel arrangement recited in the present claims. For example, the pixel arrangement of Kim does not appear to have any of the elements associated with a "virtual square," including "a first pixel" and "another first pixel" at the centers of adjacent virtual squares, "a second pixel separated from the first pixels and having a center at the first vertex," and "a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex." Indeed, Kim does *not* designate any of the disclosed pixels as "first," "second," and "third" pixels, as defined in the present claims. As such, there is no apparent reason why, without *arbitrarily* designating the first, second, and third pixels of Kim, a person having ordinary skill in the art at the time when the present invention was made would have modified the first, second, and third pixels allegedly disclosed in Credelle in such a way as to arrive at the pixel arrangement recited in the present claims. Such an arbitrary designation amounts to impermissible hindsight, which is improper. *See* MPEP 2145(X)(A); *see also In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) (stating that "it is impermissible to use the

claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious"). Accordingly, claim 1 would not have been obvious over Credelle and Kim at the time when the present invention was made.

Therefore, Appellant respectfully requests that the rejection of claim 1 be reversed, and that claim 1 be allowed. Furthermore, because claims 2-5 and 12 each depend, directly or indirectly, from claim 1, they each incorporate all the terms and features of claim 1 in addition to other features, which together further patentably distinguish the claim over the cited references. Accordingly, Appellant respectfully requests that the rejections of claims 2-5 and 12 be reversed, and that these claims be allowed as well.

B. <u>The Remaining References Do Not Cure the Deficiencies of Credelle and Kim</u>

Claims 7-10, 13, 14, and 17 depend from claim 1, which is allowable over Credelle and Kim, as discussed above. The propositions for which Chao and Inuiya are cited (e.g., pixel shapes and colors, respectively) do not appear to cure the deficiencies of Credelle and Kim in disclosing the pixel arrangement structure (including first, second, and third pixels as identified by their positions in a virtual square, where the second pixel is larger than the third pixel), as presently recited in claim 1. *See* Final Rejection, pages 9 and 12.

Because claims 7-10, 13, 14, and 17 each depend, directly or indirectly, from claim 1, they each incorporate all the terms and features of claim 1 in addition to other features, which together further patentably distinguish the claim over the cited references. Therefore, claims 7-10, 13, 14, and 17 should also be allowable over Credelle, Kim, Inuiya, and Chao. Accordingly, Appellant respectfully requests that the rejections of claims 7-10, 13, 14, and 17 be reversed, and that these claims be allowed as well.

III. Concluding Remarks

In light of the above remarks, Appellant submits that all of pending claims 16, 17, 19, 21-24, 37, and 38 are in condition for allowance. Accordingly, Appellant requests that the rejections of claims 16, 17, 19, 21-24, 37, and 38 be reversed. As such, Appellant requests that the case be remanded to the Examiner for allowance of the claims.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Justin O. Ehresmann, Ph.D.
Reg. No. 73,867
626/795-9900

JOE/css

5. CLAIM APPENDIX

1. A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex;

an other first pixel on a line defined by the center of the virtual square and the first vertex, the first pixel, the second pixel, and the other first pixel being consecutive pixels on the line; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

wherein the second pixel and the third pixel have polygonal shapes, and

wherein the second pixel has a larger area than that of the third pixel.

2. The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels, and

the second pixels are separated from each other by the first pixel.

3. The pixel arrangement structure of claim 1, wherein

the third pixel comprises a pair of third pixels, and

the third pixels are separated from each other by the first pixel.

4. The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels,

the third pixel comprises a pair of third pixels, and

the second pixels and the third pixels enclose the first pixel in the virtual square.

5. The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

6. (Canceled)

7. The pixel arrangement structure of claim 5, wherein

one of the second pixel and the third pixel has a hexagonal shape and another of the second pixel and the third pixel has a quadrilateral shape.

8. The pixel arrangement structure of claim 7, wherein the first pixels are symmetrical to each other.

9. The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. The pixel arrangement structure of claim 9, wherein a shortest distance between the first pixel and the second pixels as well as a shortest distance between the first pixel and the third pixels is a same first length.

11. A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

the first pixel, the second pixel, and the third pixel have polygonal shapes,

a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length, and

a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels.

12. The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. The pixel arrangement structure of claim 1, wherein

the first pixel is configured to emit green light,

one of the second pixel and the third pixel is configured to emit blue light, and

another of the second pixel and the third pixel is configured to emit red light.

14. The pixel arrangement structure of claim 5, wherein

at least one of the second pixel and the third pixel has a hexagonal shape.

15-16. (Canceled)

17. The pixel arrangement structure of claim 1, wherein the second pixel has a different polygonal shape from the third pixel.

6. EVIDENCE APPENDIX

None.

7. RELATED PROCEEDING APPENDIX

None.

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Justin O. Ehresmann/Sherlin Yaghoubzadeh
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
APPEAL FORWARDING FEE	1413	1	2000	2000
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**2000**

Electronic Acknowledgement Receipt	
EFS ID:	30629398
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Justin O. Ehresmann/Sherlin Yaghoubzadeh
Filer Authorized By:	Justin O. Ehresmann
Attorney Docket Number:	72827/S1437
Receipt Date:	11-OCT-2017
Filing Date:	26-APR-2013
Time Stamp:	17:14:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$2000
RAM confirmation Number	101217INTEFSW17145700
Deposit Account	
Authorized User	
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	Transmittal Letter	72827_Appeal_Submission.PDF	14032 003fe1a179efb307f7b3c18d7692cd5f78e933d8	no	1
Warnings:					
Information:					
2	Appeal Brief Filed	72827_Appeal_Brief.PDF	132676 4771b473947d0b1da4158936836da0a9ec6aa817	no	16
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30615 a18a3138f85dfb54041340d11e86e140d698900a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	177323		

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on October 11, 2017 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

/Sherlin Yaghoubzadeh/
Sherlin Yaghoubzadeh

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Yang, Kwang-Su	
Docket No.	: 072827	

SUBMISSION OF APPELLANT'S BRIEF (§ 1.192)
TO THE PATENT TRIAL AND APPEAL BOARD

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
October 11, 2017

Commissioner:

Enclosed for filing is the Appellant's Brief for this application.

_____ An extension of time to file Appellant's Brief is requested, and a Petition for Extension of Time and the applicable fee are filed herewith.

__X__ $2,000.00 to cover the appeal forwarding fee is submitted herewith.

_____ An oral hearing of the appeal is requested, $1,300.00, the fee for the oral hearing, is submitted herewith.

The Commissioner is hereby authorized to charge any further fees under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Justin O. Ehresmann, Ph.D.
Reg. No. 73,867
626/795-9900

JOE/sy

102567332_1

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 08/30/2017
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
08/30/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@lrrc.com
pair_cph@firsttofile.com

Notice of Panel Decision from Pre-Appeal Brief Review	Application No.	Applicant(s)
	13/872,018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

This is in response to the Pre-Appeal Brief Request for Review filed 11 August, 2017.

1. ☐ **Improper Request** – The Request is improper and a conference will not be held for the following reason(s):

☐ The Notice of Appeal has not been filed concurrent with the Pre-Appeal Brief Request.
☐ The request does not include reasons why a review is appropriate.
☐ A proposed amendment is included with the Pre-Appeal Brief request.
☐ Other: .

The time period for filing a response continues to run from the receipt date of the Notice of Appeal or from the mail date of the last Office communication, if no Notice of Appeal has been received.

2. ☒ **Proceed to Board of Patent Appeals and Interferences** – A Pre-Appeal Brief conference has been held. The application remains under appeal because there is at least one actual issue for appeal. Applicant is required to submit an appeal brief in accordance with 37 CFR 41.37. The time period for filing an appeal brief will be reset to be one month from mailing this decision, or the balance of the two-month time period running from the receipt of the notice of appeal, whichever is greater. Further, the time period for filing of the appeal brief is extendible under 37 CFR 1.136 based upon the mail date of this decision or the receipt date of the notice of appeal, as applicable.

☒ The panel has determined the status of the claim(s) is as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: *1-5, 7-14 and 17*.
Claim(s) withdrawn from consideration: _____.

3. ☐ **Allowable application** – A conference has been held. The rejection is withdrawn and a Notice of Allowance will be mailed. Prosecution on the merits remains closed. No further action is required by applicant at this time.

4. ☐ **Reopen Prosecution** – A conference has been held. The rejection is withdrawn and a new Office action will be mailed. No further action is required by applicant at this time.

All participants:

(1) *KWANG-SU YANG*.	(3)*AMARE MENGISTU*.
(2) *CHANH NGUYEN*.	(4)_____.

/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	/CHANH NGUYEN/ Supervisory Patent Examiner, Art Unit 2691	/Amare Mengistu/ Supervisory Patent Examiner, Art Unit 2623

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on August 11, 2017 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Anita G. Johnson

Inventor(s)	:	Sang-Shin Lee	Confirmation No. 4833
Application No.	:	13/872,018	
Filed	:	April 26, 2013	
Title	:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	:	2691	
Examiner	:	Kwang-Su Yang	
Docket No.	:	072827	

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
August 11, 2017

Commissioner:

Appellant requests review of the continued rejection of claims 1-5, 7-14, and 17 in the above-identified application. No amendments are being filed with this Request. This Request is being filed with a Notice of Appeal. The review is requested for the reasons stated below.

Rejection of Claim 11 under 35 U.S.C. §102(b)

Claim 11 was rejected under pre-AIA 35 U.S.C. §102(b) as allegedly anticipated by Credelle et al. (U.S. 2003/0128179). Independent claim 11 recites, in relevant part,

> a first pixel having a center coinciding with a center of a virtual square;
> another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;
> a second pixel separated from the first pixels and having a center at the first vertex; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

the first pixel, the second pixel, and the third pixel have polygonal shapes,

a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length, and

a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels (*emphasis* added).

In rejecting claim 11[1] over Credelle, the May 11, 2017 Final Rejection cites Credelle, FIG. 18A as showing "a shortest distance between blue pixels 102 is longer than the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104; i.e. a same first length in the above limitation". Office action, page 4. The Office action appears to rely on the statement that "[a]djacent pixel[s] in a display panel should have some distance between them such as an insulating gap between them" as support for the proposition that Credelle discloses the recited relative pixel separation distances. Final Rejection, page 13. Appellant respectfully traverses.

Even if the pixel arrangement shown in Credelle, FIG. 18A inherently includes insulating gaps separating the first, second, and third pixels (which Appellant does not necessarily concede), Credelle does *not* appear to disclose or provide any *values*, whether relative or absolute, for the distances of those alleged insulating gaps between the edges of the pixels. Indeed, the Office action does not cite any portion of Credelle regarding the *actual* distances of any insulating gaps, and instead appears to provide only a conclusory statement that Credelle discloses the relative distances between pixels. As Credelle does not actually appear to disclose the specific pixel separation distances recited in claim 11, including "a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a *same first length*, and a shortest distance between the first pixels is a *second length that is longer than the first length* and a shortest distance between each of the second pixels and the third pixels", Credelle does not anticipate each and every feature of claim 11. Further, as Credelle does not disclose or even suggest a reason for selecting *any* particular combination of pixel separation distances, the specific combination of pixel separation distances

[1] While the quoted text from the Final Rejection refers to Claim 1, the Final Rejection otherwise (i.e., in the section 5 heading and in the list of features) indicates that the rejection is of claim 11. Therefore, Appellant believes that the quoted section intended to refer to claim 11, and has addressed the rejection accordingly.

would also not have been obvious without impermissible hindsight. Therefore, Appellant respectfully requests that the rejection of claim 11 be reversed, and that this claim be allowed.

Rejection of Claims 1-5, 7-10, 12-14, and 17 under 35 U.S.C. §103(a)

Claims 1-5 and 12 were rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Kim et al. (U.S. 2004/0183764). Independent claim 1 recites, in relevant part:

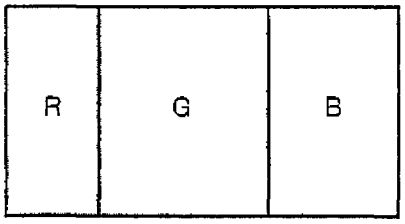
> a first pixel having a center coinciding with a center of a virtual square;
> another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;
> a second pixel separated from the first pixels and having a center at the first vertex;
>
> and
>
> a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,
> wherein the second pixel has a larger area than that of the third pixel.

In rejecting claim 1 over Credelle and Kim, the Final Rejection admits that "Credelle does not teach wherein the second pixel has a larger area than that of the third pixel". The Final Rejection attempts to remedy the above-referenced deficiencies of Credelle by citing Kim for "the size of the green sub-pixel is larger than that of a red sub-pixel". Final Rejection, page 7.

However, there is no apparent reason why a person having ordinary skill in the art at the time the present invention was made would have adapted the feature of "wherein the second pixel has a larger area than that of the third pixel" in Credelle. Credelle discloses that the pixels positioned at neighboring vertices of adjacent virtual squares (e.g., the recited second and third pixels) are the same size. *See* Credelle, FIG. 18A. Credelle only describes "displacements" of pixel arrangement structures, and does not appear to disclose, teach, or even suggest modifying the sizes of the pixels. *See, e.g.,* Credelle, paragraphs [0010], [0020], and [0021]. As such, one having ordinary skill in the art would not have found motivation in Credelle to modify the sizes of the pixels in *any* manner, much less in such a way that the second pixel is larger than the third pixel.

The Final Rejection states that Kim teaches the feature "wherein the second pixel has a larger area than that of the third pixel" because Kim, FIG. 3 shows "the size of a green sub-pixel is larger than that of a red sub-pixel". Office action, page 7. However, Kim shows a pixel

arrangement structure in which the red, green, and blue pixels are arranged in a horizontal row. FIG. 3 of Kim is reproduced below for convenience.



Kim, FIG. 3

This pixel arrangement is *structurally different* from the pixel arrangement disclosed in Credelle and the pixel arrangement recited in the present claims. For example, the pixel arrangement of Kim does not appear to have any of the elements associated with a "virtual square", including "a first pixel" and "another first pixel" at the centers of adjacent virtual squares, "a second pixel separated from the first pixels and having a center at the first vertex", and "a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex". Indeed, Kim does *not* designate any of the disclosed pixels as "first", "second", and "third" pixels, as defined in the present claims. As such, it does not appear possible, without arbitrarily designating the first, second, and third pixels of Kim, to modify the first, second, and third pixels allegedly disclosed in Credelle to thereby arrive at the pixel arrangement recited in the claims. Such an arbitrary designation amounts to impermissible hindsight, which is improper. *See* MPEP 2145(X)(A); *see also In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) (stating that "it is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious"). Accordingly, claim 1 is not obvious over Credelle and Kim.

Therefore, Appellant respectfully requests that the rejection of claim 1 be reversed, and that claim 1 be allowed. Furthermore, because claims 2-5 and 12 each depend, directly or indirectly, from claim 1, they each incorporate all the terms and features of claim 1 in addition to other features, which together further patentably distinguish the claim over the cited references. Accordingly, Appellant respectfully requests that the rejections of claims 2-5 and 12 be reversed, and that these claims be allowed as well.

Claim 13 was rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Kim, and further in view of Inuiya et al. (U.S. 6,882,364). Furthermore, claims

7-10, 14, and 17 were rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Kim, and further in view of Chao et al. (U.S. 2008/0001525).

However, claims 7-10, 13, 14, and 17 depend from claim 1, which is allowable over Credelle and Kim, as discussed above. The propositions for which Chao and Inuiya are cited (e.g., pixel shapes and colors, respectively) do not appear to cure the deficiencies of Credelle in disclosing the pixel arrangement structure recited in claim 1. *See* Final Rejection, pages 9 and 12.

Because claims 7-10, 13, 14, and 17 each depend, directly or indirectly, from claim 1, they each incorporate all the terms and features of claim 1 in addition to other features, which together further patentably distinguish the claim over the cited references. Therefore, claims 7-10, 13, 14, and 17 should also be allowable over Credelle, Kim, Inuiya, and Chao. Accordingly, Appellant respectfully requests that the rejections of claims 7-10, 13, 14, and 17 be reversed, and that these claims be allowed as well.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

Peter Hsueh
Reg. No. 45,574
for

By _____

Justin O. Ehresmann
Reg. No. 73,867
626/795-9900

JOE/agj

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on August 11, 2017 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Anita G. Johnson

Inventor(s) : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Kwang-Su Yang

Docket No. : 072827

NOTICE OF APPEAL FROM THE PRIMARY EXAMINER TO THE PATENT TRIAL AND APPEAL BOARD

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
August 11, 2017

Commissioner:

Applicant hereby appeals to the Patent Trial and Appeal Board from the Office action dated May 11, 2017 of the Primary Examiner's final action of claims 1-5, 7-14, and 17.

__X__ $800.00 to cover the fee for this appeal is submitted herewith.
__X__ A Pre-Appeal Brief Request for Review is submitted herewith.
_____ No fee is required for this Notice of Appeal because the fee was paid in a prior appeal.

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

Peter Ltsue H
Reg. No. 45,574

By _____ for
Justin O. Ehresmann, Ph.D.
Reg. No. 73,867
626/795-9900

JOE/agj
AGJ 102075564.1-*-08/11/2017 1:26 PM

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Justin O. Ehresmann/Anita Johnson
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
NOTICE OF APPEAL	1401	1	800	800
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**800**

Electronic Acknowledgement Receipt

EFS ID:	30060254
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Justin O. Ehresmann/Anita Johnson
Filer Authorized By:	Justin O. Ehresmann
Attorney Docket Number:	72827/S1437
Receipt Date:	11-AUG-2017
Filing Date:	26-APR-2013
Time Stamp:	17:47:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$800
RAM confirmation Number	081417INTEFSW17493200
Deposit Account	
Authorized User	
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		72827-Ntc-Appeal-Pre-Appeal-Brief.PDF	69589 a582d4e3f86c0b316b755528fd316c0ff0bee99c	yes	6

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Pre-Brief Conference request	2	6
	Notice of Appeal Filed	1	1

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30408 7d3772c7492e088c2b90cb84df7d33540acc2d91	no	2

Warnings:

Information:

Total Files Size (in bytes):	99997

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New Applications Under 35 U.S.C. 111

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National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 10-39791	02-13-1998	Nakamura et al.	Japan Patent Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

JEJ 101836378.1-*-07/14/2017 12:28 PM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/eg

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	29789284
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	14-JUL-2017
Filing Date:	26-APR-2013
Time Stamp:	15:46:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$180
RAM confirmation Number	071717INTEFSW15475800
Deposit Account	
Authorized User	
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		72827_IDS.PDF	35621 ef50736d26968fad44da008513e7c935ceaabb37	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Foreign Reference	JP_10039791.pdf	6672196 9c34d39c27fb3f982bb608491c168c1b4beaafaa	no	11
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30691 e48e27897d84d244804cb3dddc8acd5fc965ad68	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	6738508		

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on July 14, 2017 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Elizabeth Gomez

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 072827	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT WITH FEE UNDER 37 CFR §§ 1.97(d) AND 1.17(p)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
July 14, 2017

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing a reference that is known to applicant. Copies of each of the listed Foreign Patent Documents and Other Documents references are enclosed.

It is respectfully requested that the listed reference be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No. 13/872,018

Applicant's undersigned attorney hereby certifies, in accordance with 37 CFR § 1.97(e)(1), that each item of information contained in the information disclosure statement was first cited in a communication from any foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

The processing fee of $180.00 as required by 37 CFR § 1.17(p) is submitted herewith. The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/eg
Enclosures: Information Disclosure Statement, w/reference

JEJ 101836234.1-*-07/13/2017 3:43 PM

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on May 12, 2017 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

/Sherlin Yaghoubzadeh/
Signature

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Yang, Kwang-su	
Docket No.	: 072827	

STATEMENT OF INTERVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
May 12, 2017

Commissioner:

Applicant thanks Examiner Yang for taking the time to participate in the Applicant-Initiated telephone interview with Applicant's representatives on May 1, 2017. During the interview, the Examiner and Applicant's representative discussed Applicant's Amendment filed on April 14, 2017.

The Examiner and Applicant's representative discussed the Examiner's position that FIG. 18A of Credelle et al. (U.S. Patent App. Pub. No. 2003/0128179) teaches the pixel arrangement structure recited in the present claims, including "an other first pixel on a line defined by the center of the virtual square and the first vertex, the first pixel, the second pixel, and the other first pixel being consecutive pixels on the line" and separation between the first, second, and third pixels. No agreement was reached.

101277273_1

The Examiner and Applicant's representative also discussed amendments to independent claim 1 to incorporate independently allowable claims 9 and 10, or in the alternative, independently allowable claim 13.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Justin O. Ehresmann
Reg. No. 73,867
626/795-9900

JOE/css

101277273_1

Electronic Acknowledgement Receipt

EFS ID:	29195458
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Justin O. Ehresmann/Sherlin Yaghoubzadeh
Filer Authorized By:	Justin O. Ehresmann
Attorney Docket Number:	72827/S1437
Receipt Date:	12-MAY-2017
Filing Date:	26-APR-2013
Time Stamp:	14:31:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	72827_Statement_of_Interview.pdf	17784 b64efde472aa8e9963a931324087697 89e164f20	no	2

Warnings:

Information:	
Total Files Size (in bytes):	17784

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.

New Applications Under 35 U.S.C. 111

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National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 05/11/2017
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
05/11/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@lrrc.com
pair_cph@firsttofile.com

Office Action Summary	Application No. 13/872,018	Applicant(s) LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04/14/2017*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-5,7-14 and 17* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,7-14 and 17* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Response to Amendment

2. The amendment filed on 04/14/2017 has been entered and considered by the examiner.

Claim Warning

3. Applicant is advised that should claim 8 be found allowable, claim 9 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, **i.e., a limitation "wherein the second pixel has a larger area than that of the third pixel" in claim 1 which is a parent claim of claim 8 and a limitation "wherein each of the second pixels is larger in area than each of the third pixels" in claim 9 which is a child claim of claim 8**, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 11 is rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Credelle (U.S. Pub. No. US 2003/0128179 A1).

As to claim 1, Credelle (Figs. 1, 18A and 20) teaches **a pixel arrangement structure** (an octal subpixel grouping; Fig. 18A) **of an organic light emitting diode (OLED) display** (a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14)**, comprising:**

- **a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display** (blue subpixel 102, red subpixel 104, and green subpixel 106; a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14; Fig. 18A) **and comprising:**
- **a first pixel** (a blue subpixel 102) **having a center coinciding with a center of a virtual square** (a virtual square consists of centers of two red subpixels and two green subpixels; Fig. 18A**;**
- **another first pixel** (a blue subpixel in a first row and a fourth column) **having a center coinciding with a center of another virtual square** (another virtual square consists of two green subpixels and two red subpixels; Fig. 18A)**, the virtual squares sharing a common side having endpoints at a common first vertex** (a center of the green subpixel 106 in a first row and a third column) **and a common second vertex** (a center of the red subpixel 104 in a second row and a third column) **of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light** (red subpixel 104 and green subpixel 106 are located alternately in neighboring vertices in each virtual square; Fig. 18A)**;**

- **a second pixel** (green subpixel in a first row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and having a center at the first vertex** (the center of the green subpixel in a first row and a third column) (Figs. 1 and 18A)**; and**

- **a third pixel** (red subpixel in a second row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and the second pixel** (the green subpixel in a first row and a third column)**, and having a center at the second vertex** (a center of the red subpixel in a second row and a third column) (Figs. 1 and 19A)~~,~~

- **the first pixel, the second pixel, and the third pixel have polygonal shapes** (rectangular shapes; Figs. 1 and 18A)**,**

- **a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length** (the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104 are same; Fig. 18A)**, and**

- **a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels** (a shortest distance between blue pixels 102 is longer than the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104, i.e., a same first length in the above limitation, and a shortest distance between each of green pixels 106 and red pixels 104; Fig. 18A)**.**

Claim Rejections - 35 USC § 103

6. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-5 and 12 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle in view of Kim (U.S Pub. No. US 2004/0183764 A1).

As to claim 1, Credelle (Figs. 1, 18A and 20) teaches **a pixel arrangement structure** (an octal subpixel grouping; Fig. 18A) **of an organic light emitting diode (OLED) display** (a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14)**, comprising:**

- **a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display** (blue subpixel 102, red subpixel 104, and green subpixel 106; a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14; Fig. 18A) **and comprising:**

- **a first pixel** (a blue subpixel 102) **having a center coinciding with a center of a virtual square** (a virtual square consists of centers of two red subpixels and two green subpixels; Fig. 18A)**;**

- **another first pixel** (a blue subpixel in a first row and a fourth column) **having a center coinciding with a center of another virtual square** (another virtual square consists of two green subpixels and two red subpixels; Fig. 18A)**, the virtual squares sharing a common side having endpoints at a common first vertex** (a center of the green subpixel 106 in a first row and a third column) **and a common second vertex** (a

center of the red subpixel 104 in a second row and a third column) **of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light** (red subpixel 104 and green subpixel 106 are located alternately in neighboring vertices in each virtual square; Fig. 18A)**;**

- **a second pixel** (green subpixel 106 in a first row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and having a center at the first vertex** (the center of the green subpixel in a first row and a third column) (Figs. 1 and 18A)**;**

- **an other first pixel** (a blue subpixel above the subpixel at the first row and the second column) **on a line defined by the center of the virtual square** (the center of the blue subpixel at the first row and the fourth column) **and the first vertex** (the center of green subpixel 106 in the first row and the third row)**, the first pixel** (the blue subpixel in the first row and the fourth column)**, the second pixel** (the green subpixel 106 in the first row and the third column)**, and the other first pixel** (the blue subpixel above the subpixel at the first row and the second column) **being consecutive pixels on the line** (Fig. 18A)**; and**

- **a third pixel** (red subpixel in a second row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and the second pixel** (the green subpixel in a first row and a third column)**, and having a center at the second vertex** (a center of the red subpixel in a second row and a third column) (Figs. 1 and 19A)~~,~~

- **wherein the second pixel and the third pixel have polygonal shapes** (rectangular shapes; Fig. 18A)**.**

Credelle does not teach **wherein the second pixel has a larger area than that of the third pixel.**

Kim (Fig. 3) teaches

- **wherein the second pixel has a larger area than that of the third pixel** (the size of a green sub-pixel is larger than that of a red sub-pixel; Fig. 3; the present invention is applicable not only to a plasma display but also to a flat panel display (FPD) such as an organic electro luminescence display (OLED) or a liquid crystal display; [0060], lines 7-10)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different sub-pixel sizes as taught by Kim in a subpixel grouping of Credelle because the different sub-pixel sizes can correct the white balance and the color coordinate.

As to claim 2, Credelle teaches

- **wherein the second pixel comprises a pair of second pixels** (a green subpixel in a first row and a third column and a green subpixel in a second row and a first column; Fig. 18A)**, and the second pixels are separated from each other by the first pixel** (the green subpixel in a first row and a third column and the green subpixel in a second row and a first column are separated by the blue subpixel in a first row and a second column) (Figs. 1 and 18A)**.**

As to claim 3, Credelle teaches

- **wherein the third pixel comprises a pair of third pixels** (a red subpixel in a second row and a third column and a red subpixel in a first row and a first column; Fig. 18A)**, and the third pixels are separated from each other by the first pixel** (the red

subpixel in a second row and a third column and the red subpixel in a first row and a first column are separated by the blue subpixel in a first row and a second column) (Figs. 1 and 18A).

As to claim 4, Credelle teaches

- **wherein the second pixel comprises a pair of second pixels** (a green subpixel in a first row and a third column and a green subpixel in a second row and a first column; Fig. 18A)**, the third pixel comprises a pair of third pixels** (a red subpixel in a second row and a third column and a red subpixel in a first row and a first column; Fig. 18A)**, and the second pixels and the third pixels enclose the first** pixel (the blue subpixel in a first row and a second column) **in the virtual square** (Figs. 1 and 18A).

As to claim 5, Credelle teaches

- **wherein each of the second pixels and the third pixels is larger in area than the first pixel** (green pixels 106 and red pixels 104 is larger in size than blue pixels 101; Fig. 18A).

As to claim 12, Credelle teaches

- **wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light** (blue, green and red color; Figs. 1 and 18A).

8. Claims 7-10, 14 and 17 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle, in view of Kim as applied to claim 1 above, and further in view of Chao (U.S. Pub. No. US 2008/0001525 A1).

As to claim 7, Credelle and Kim teach **the pixel arrangement structure of**

claim 5.

Credelle and Kim do not teach **wherein one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape** (each of the red, green, and blue light emission **zones** 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle as modified by Koyama because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 8, Kim teaches **wherein**

- **the first pixels are symmetrical to each other** (the blue sub-pixels are symmetric to each other; Fig. 18A)**.**

As to claim 9, Kim teaches **wherein**

- **each of the second pixels is larger in area than each of the third pixels** (the size of a green sub-pixel is larger than that of a red sub-pixel; Fig. 3; the present

invention is applicable not only to a plasma display but also to a flat panel display (FPD) such as an organic electro luminescence display (OLED) or a liquid crystal display; [0060], lines 7-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different sub-pixel sizes as taught by Kim in a subpixel grouping of Credelle as modified by Chao because the different sub-pixel sizes can correct the white balance and the color coordinate.

As to claim 10, Kim teaches **wherein**

- **a shortest distance between the first pixel and the second pixels as well as a shortest distance between the first pixel and the third pixel is a same first length** (the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104 are same; Fig. 18A).

As to claim 14, Credelle and Kim teach **the pixel arrangement structure of claim 5.**

Credelle and Kim do not teach **wherein at least one of the second pixel and the third pixel has hexagonal shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **at least one of the second pixel and the third pixel has a hexagonal shape** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle, circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle as modified by Kim because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 17, Credelle and Kim teach **the pixel arrangement structure of claim 1.**

Credelle and Kim do not expressly teach **wherein the second pixel has a different polygon shape from the third pixel.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches

- **wherein the second pixel has a different polygon shape from the third pixel** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle as modified by Kim because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

9. Claim 13 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle, in view of Kim as applied to claim 1 above, and further in view of Inuiya (U.S. Patent No. US 6,882,364 B1).

As to claim 13, Credelle and Kim teach **the pixel arrangement structure of claim 1.**

Credelle and Kim do not expressly teach **wherein the first pixel is configured to emit green light, one of the second pixel and the third pixel is configured to emit blue light, and another of the second pixel and the third pixel is configured to emit red light.**

Inuiya (Figs. 1-16) teaches **wherein**

- **the first pixel is configured to emit green light** (a primary color G)**, one of the second pixel and the third pixel is configured to emit blue light** (a primary color B)**, and another of the second pixel and the third pixel is configured to emit red light** (a primary color R) (Fig. 6 and a honeycomb pattern in Fig. 7B)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a honeycomb pattern as taught by Inuiya in a subpixel grouping of Credelle as modified by Chao because it is possible to arrange the pixels more densely than with the square lattice arrangement.

Response to Arguments

10. Applicant's arguments filed 04/14/2017 have been fully considered but they are not persuasive.

As to claim 11, Applicant argues that the distance between the first (blue) pixels and the distance between the first (blue) and second (green) pixels or the first (blue) and

third (red) pixels are 0. However, the Office respectfully disagrees. Adjacent pixels in a display panel should have some distance between them such as an insulating gap between them.

Applicants' arguments with respect to claims 1-5, 7-10, 12-14 and 17 have been considered but are moot in view of the new grounds of rejection.

In view of amendment, references of Credelle, Kim, Chao and Inuiya have been used for the new grounds of rejection.

Therefore, the Office maintains the rejections as recited above.

Conclusion

11. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiry

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang-Su Yang whose telephone number is 571-270-7307. The examiner can normally be reached on Mon-Fri during 9:00am-6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. 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).

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

Notice of References Cited	Application/Control No. 13/872,018	Applicant(s)/Patent Under Reexamination LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	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-2004/0183764 A1	09-2004	Kim, Yong Duek	G09G3/2059	345/88
*	B	US-6,882,364 B1	04-2005	Inuiya; Masafumi	H04N9/045	348/237
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

CPC- SEARCHED		
Symbol	Date	Examiner
G09G3/3208 H01L27/3216 H01L27/3218	06/23/2015	KY

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST: Inventor Search and Assignee Search	06/23/2015	KY
EAST: Text Search	06/23/2015; 06/24/2015	KY
EAST: IDS Search	10/12/2015	KY
EAST: Updated Text Search	02/22/2016; 02/23/2016	KY
EAST: IDS Search	06/17/2016	KY
EAST: Updated Text Search	07/26/2016; 08/29/2016	KY
EAST: Updated Text Search	12/23/2016	KY
EAST: Updated Text Search	05/05/2017	KY

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/KWANG-SU YANG/ Primary Examiner, Art Unit 2691

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		KR 10-2008-0111130	12-22-2008	CAMBRIDGE DISPLAY TECHNOLOGY LIMITED	Korea Patent Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EG PAS1461861.1-*-02/3/17 1:37 PM

EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	05/05/2017

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/eg

Sheet 1 of 1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L13	117	(organic adj light OLED) and (pixel sub$1pixel) with (honey$1comb check$2) same red same green same blue	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/05/05 19:44
L14	4	(organic adj light OLED) and (pixel sub$1pixel) with honey$1comb same red same green same blue	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/05/05 19:51
L15	34	(organic adj light OLED) and honey$1comb same red same green same blue	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/05/05 19:53
L18	3	"20110012820".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/05/05 20:06

EAST Search History (Interference)

<This search history is empty>

5/ 5/ 2017 9:09:33 PM
C:\ Users\ kyang\ Documents\ EAST\ Workspaces\ 13872018.wsp

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

✓	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	06/24/2015	10/12/2015	02/23/2016	06/17/2016	08/29/2016	12/23/2016	05/05/2017		
	1	✓	✓	✓	✓	✓	✓	✓		
	2	✓	✓	✓	✓	✓	✓	✓		
	3	✓	✓	✓	✓	✓	✓	✓		
	4	✓	✓	✓	✓	✓	✓	✓		
	5	✓	✓	✓	✓	✓	✓	✓		
	6	N	-	-	-	-	-	-		
	7	✓	✓	✓	✓	✓	✓	✓		
	8	✓	✓	✓	✓	✓	✓	✓		
	9	✓	✓	✓	✓	✓	O	✓		
	10	✓	✓	✓	✓	✓	O	✓		
	11	O	O	✓	O	O	✓	✓		
	12	✓	✓	✓	✓	✓	✓	✓		
	13	✓	✓	✓	✓	✓	O	✓		
	14	✓	✓	✓	✓	✓	✓	✓		
	15		✓	-	-	-	-	-		
	16		✓	✓	✓	✓	✓	-		
	17		✓	✓	✓	✓	✓	✓		

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 05/05/2017
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
05/05/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@lrrc.com
pair_cph@firsttofile.com

Applicant-Initiated Interview Summary	Application No.	Applicant(s)		
	13/872,018	LEE, SANG-SHIN		
	Examiner	Art Unit	AIA (First Inventor to File) Status	Page
	KWANG-SU YANG	2691	No	1 of 1

All participants (applicant, applicant's representative, PTO personnel):

1. KWANG-SU YANG (Primary Examiner); Telephonic
2. JUSTIN EHRESMANN (Attorney of Record); Telephonic

Date of Interview: 01 May 2017

Claim(s) discussed: 1, 11, 9 and 13

Identification of prior art discussed: Credelle (U.S. Pub. No. US 2003/0128179 A1)

Brief Description of main topic of discussion: Discussed amendments filed on 04/14/2017.

Issues Discussed:

Claim Interpretation and/or scope:
As to claim 1, Examiner mentions that the added limitation "an other first pixel on a line defined by the center of the virtual square and the first vertex, the first pixel, the second pixel, and the other first pixel being consecutive pixels on the line" still reads on Credelle and suggests that claim 13 be incorporated into claim 1 which is the unamended previous claim for the instant application to be placed in condition for allowance.
As to claim 11, Examiner mentions that adjacent pixels have a distance between them such as an insulating gap.

/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable time limit of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicant's responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04

Please further see:

MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on April 14, 2017 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Anita G. Johnson

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Yang, Kwang-su	
Docket No.	: 072827	
Customer No.	: 23363	

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
April 14, 2017

Commissioner:

In response to the Office action of December 30, 2016, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex; [[and]]

an other first pixel on a line defined by the center of the virtual square and the first vertex, the first pixel, the second pixel, and the other first pixel being consecutive pixels on the line; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

wherein ~~the respective first pixels have octagonal shapes that are elongated along respective diagonals toward the second vertex, and~~

the second pixel and the third pixel have polygonal shapes, and

wherein the second pixel has a larger area than that of the third pixel.

2. (Original) The pixel arrangement structure of claim 1, wherein
the second pixel comprises a pair of second pixels, and
the second pixels are separated from each other by the first pixel.

3. (Original) The pixel arrangement structure of claim 1, wherein
the third pixel comprises a pair of third pixels, and
the third pixels are separated from each other by the first pixel.

4. (Original) The pixel arrangement structure of claim 1, wherein
the second pixel comprises a pair of second pixels,
the third pixel comprises a pair of third pixels, and
the second pixels and the third pixels enclose the first pixel in the virtual square.

5. (Original) The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

6. (Canceled)

7. (Previously Presented) The pixel arrangement structure of claim 5, wherein
one of the second pixel and the third pixel has a hexagonal shape and another of the second pixel and the third pixel has a quadrilateral shape.

8. (Previously Presented) The pixel arrangement structure of claim 7, wherein the first pixels are symmetrical to each other.

9. (Original) The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. (Previously Presented) The pixel arrangement structure of claim 9, wherein a shortest distance between the first pixel and the second pixels as well as a shortest distance between the first pixel and the third pixels is a same first length.

11. (Currently Amended) A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

the first pixel, the second pixel, and the third pixel have polygonal shapes;

a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length, and

a shortest distance between the first pixels is a [[third]] <u>second</u> length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels.

12. (Original) The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. (Previously Presented) The pixel arrangement structure of claim 1, wherein

the first pixel is configured to emit green light,

one of the second pixel and the third pixel is configured to emit blue light, and

another of the second pixel and the third pixel is configured to emit red light.

14. (Previously Presented) The pixel arrangement structure of claim 5, wherein

at least one of the second pixel and the third pixel has a hexagonal shape.

15. (Canceled)

16. (Canceled)

17. (Previously Presented) The pixel arrangement structure of claim 1, wherein the second pixel has a different polygonal shape from the third pixel.

REMARKS/ARGUMENTS

Claims 1-5, 7-14, and 17 are pending in the present application, of which claims 1 and 11 are independent. Claims 6 and 15 were previously canceled. Claim 16 has been canceled herein without prejudice. Claims 1 and 11 have been amended herein. No new matter has been introduced. Applicant respectfully requests reconsideration and allowance of claims 1-5, 7-14, and 17.

Claim Rejections Under 35 U.S.C. § 112

Claim 11 was rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite. In rejecting claim 11 under this section, page 2 of the Office action states that "[the] limitation 'a third length' is indefinite since a limitation 'a second length' is not recited in the claim. In response, Applicant has amended claim 11 to recite, in relevant part, that "a shortest distance between the first pixels is a second length" (emphasis added). Accordingly, Applicant respectfully requests withdrawal of this rejection.

Claim Rejections Under 35 U.S.C. § 102

Previously allowable claim 11 was rejected under pre-AIA 35 U.S.C. §102(b) as allegedly anticipated by Credelle et al. (U.S. Patent Publication No. 2003/0128179, hereafter "Credelle"). Applicant respectfully traverses.

In rejecting claim 11 over Credelle, the Office action cites Credelle, FIG. 18A for "a first pixel . . . having a center coinciding with a center of a virtual square . . . another first pixel . . . having a center coinciding with a center of another virtual square . . . the virtual squares sharing a common side having endpoints at a common first vertex . . . and a common second vertex . . . of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light", a second pixel "having a center at the first vertex", and a third pixel "having a center at the second vertex". Office action, pages 3-4 (**emphasis** removed). However, the Office action then cites Credelle, FIG. 1 as showing "separation among subpixels".

Office action, page 4. Applicant notes that FIG. 18A does not appear to show "separation among subpixels", and that FIG. 1 does not appear to show the features associated with a first, second, and third pixel forming a virtual square, and as defined above. Accordingly, Credelle does not appear to disclose a single example embodiment including each and every feature of the claims, as discussed above.

The Office action further states that Credelle, FIG. 18A discloses "a shortest distance between blue pixels 102 is longer than the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104." Office action, pages 4-5. However, the cited distances of Credelle are different from those of the present claims. Specifically, the present claims recite distances **between** the pixels, not distances between the respective centers of the pixels. Indeed, the distance between pixels, as defined in the present specification (for example, as L1, L2, and L3 in FIG. 6) is the distance between the edges or borders of the pixels. Specification, paragraph [0045] and FIG. 6. By this definition, the distance between the first (blue) pixels in Credelle, FIG. 18A is 0; the distance between the first (blue) and second (green) pixels or the first (blue) and third (red) pixels in Credelle, FIG. 18A is also 0, and the shortest distance between second (green) and third (red) pixels in Credelle, FIG. 18A is also 0. Therefore, Credelle, FIG. 18A does *not* actually disclose or anticipate the recited pixel separation lengths. Furthermore, Credelle, FIG. 1 appears to disclose a pixel layout in which the distances between first (blue), second (green), and third (red) pixels are approximately equal. Therefore, Credelle, FIG. 1A also does *not* actually disclose or anticipate the recited pixel separation lengths.

To the extent that the Examiner argues that the embodiments depicted in FIG. 1 and FIG. 18A can be combined to thereby produce the pixel arrangement of claim 1, Applicant respectfully traverses. Even if the diagonal arrangement for which FIG. 18A appears to be cited were to be combined with the pixel separation for which FIG. 1 appears to be cited, the resulting pixel separations would still be equivalent to those

recited in FIG. 1, and would not arrive at or anticipate the pixel separations recited in claim 1.

Further, to the extent that the Examiner argues that the pixel separation allegedly disclosed in FIG. 1 can be generalized to any set of distances and applied to the pixel layout of FIG. 18A to arrive at the present claims, Applicant respectfully traverses. MPEP § 2114.05(I) states that "if the reference's disclosed range is so broad as to encompass a very large number of possible distinct compositions, this might present a situation analogous to the obviousness of a species when the prior art broadly discloses a genus". The MPEP further states that in determining whether the claimed species would have been obvious, "[t]he fact that a claimed species or subgenus is encompassed by a prior art genus is *not sufficient* by itself to establish a *prima facie* case of obviousness." MPEP §2144.08(II) (citing *In re Baird* (16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994)) and *In re Jones (*958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (Fed. Cir. 1992), hereafter "*Jones*"*), emphasis* added*)*. Indeed, the Federal Circuit has explicitly stated that it "*decline[s]* to extract" a rule "that regardless of how broad, a disclosure of a chemical genus renders obvious any species that happens to fall within it." *Jones,* 21 USPQ2d at 1943 (declining to extract a rule from *Merck & Co. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir. 1989) that disclosure of a genus renders all species in the genus obvious) (*Jones*, *emphasis* added). Rather, a proper obviousness analysis involves an evaluation of the factors set out by the Supreme Court in *Graham v. John Deere.* MPEP §2144.08(II)(A). Here, the range of possible pixel separations is infinitely large and variable. Credelle does not appear to provide any guidance regarding the separation distances between pixels aside from the embodiment described in FIG. 1, in which the separation distances appear to be equivalent and are not specifically described as being important. As such, Credelle also does not appear to provide any motivation for arriving at the specific pixel layout recited in the claims, in which "a shortest distance between the first pixels is a second length that is longer than the first length and a shortest distance between each

of the second pixels and the third pixels". Therefore, a *prima facie* case of obviousness has not been established. Accordingly, Applicant respectfully requests that the rejection of claim 11 be withdrawn, and that this claim be allowed.

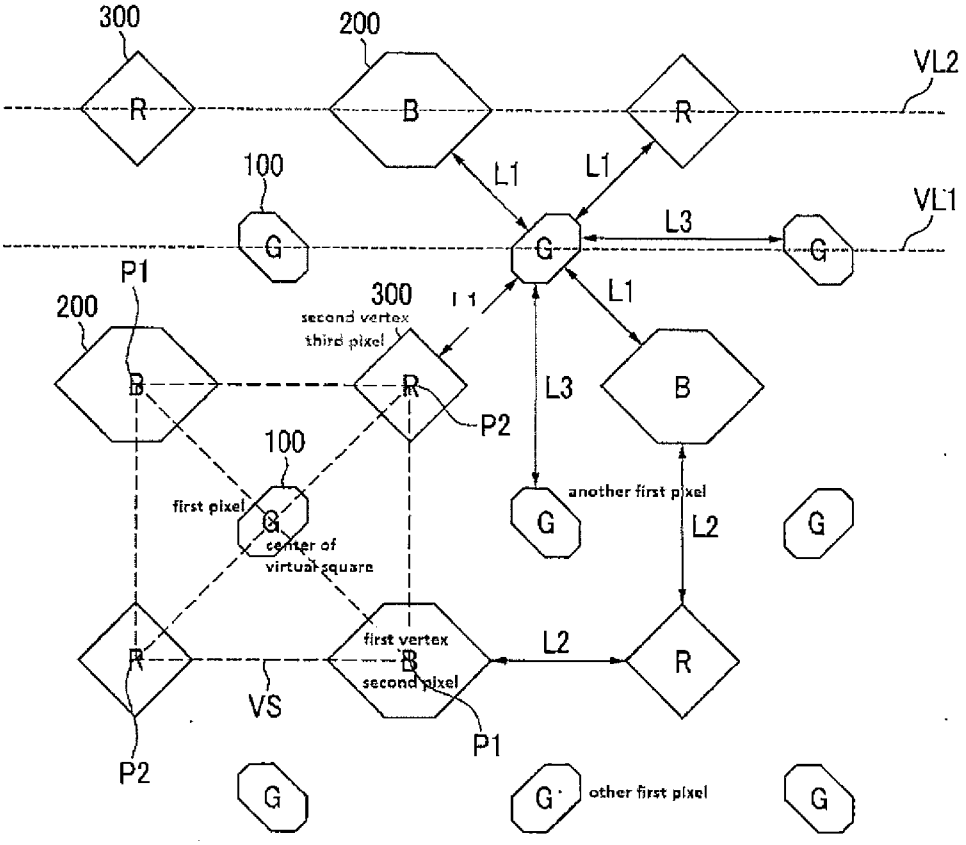
Claim Rejections Under 35 U.S.C. § 103

Claims 1-5, 12, and 16 were rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Koyama (U.S. Patent Publication No. 2006/0274090, hereafter "Koyama").

Claims 7-8, 14, and 17 were rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Koyama, and further in view of Chao et al. (U.S. Patent Publication No. 2008/0001525, hereafter "Chao").

In rejecting claim 1 over Credelle and Koyama, the Office action states that Koyama teaches that "pixels B have octagonal shapes that are elongated along respective diagonals toward the vertex, i.e., center of pixel R; FIG. 1". Office action, page 7. However, Applicant has amended claim 1 to remove features that are not necessary for patentability and that are no longer features of the claim, thereby rendering this rejection moot.

In addition, Applicant has amended claim 1 to recite, in relevant part, "an other first pixel on a line defined by the center of the virtual square and the first vertex, the first pixel, the second pixel, and the other first pixel being consecutive pixels on the line." Applicant has also amended claim 1 to recite, in relevant part, "wherein the second pixel has a larger area than that of the third pixel". Applicant has canceled claim 16 without prejudice to maintain consistency with claim 1. The amendments find full support in the original specification, drawings, and claims, for example, at FIG. 6, and no new matter has been added. FIG. 6 is reproduced and annotated below for the Examiner's convenience:



Present specification, FIG. 6

Credelle in view of Koyama does not appear to disclose the above recited features. Specifically, similar to that discussed herein in connection with the § 102 rejections of claim 11 over Credelle, Credelle does not appear to disclose a single embodiment including separated pixels, two adjacent virtual squares as defined in the claims, and "the first pixel, the second pixel, and the other first pixel being consecutive pixels on [a] line". For example, Credelle, FIG. 1 does not appear to disclose either the virtual squares or the line (as defined in the claim), while FIG. 18 does not appear to disclose separated pixels. Furthermore, Credelle does not appear to disclose any embodiment in which "the second pixel has a larger area than that of the third pixel";

rather, Credelle discloses embodiments in which the second and third pixels have the same area. *See, e.g.,* Credelle, FIG. 1 and 18A. Koyama does not appear to remedy the deficiencies of Credelle in teaching "the first pixel, the second pixel, and the other first pixel being consecutive pixels on [a] line" or "the second pixel has a larger area than that of the third pixel". *See, e.g.,* Koyama, FIGS. 1-2 (showing R, B, and G pixels having the same area, and failing to show the virtual squares and hence the line as defined in claim 1). Similarly, Chao also does not appear to teach "the first pixel, the second pixel, and the other first pixel being consecutive pixels on [a] line". *See, e.g.,* Chao, FIGS. 3D, 4A and 4B (in which the third first pixel is *not* collinear with the line defined by the center of the first virtual square and the common first vertex.) As such, the cited references of Credelle, Koyama, and Chao, alone or in combination, do not appear to teach or disclose the recited features of claim 1. Therefore, Applicant respectfully requests that the rejection of claim 1 be withdrawn, and that claim 1 be allowed.

Furthermore, because claims 2-5, 7-10, 12-14, and 17 each depend, directly or indirectly, from claim 1, they each incorporate all the terms and features of claim 1 in addition to other features, which together further patentably distinguish the claim over the cited references. Therefore, Applicant respectfully requests that the rejections of claims 2-5, 7-10, 12-14, and 17 be withdrawn and that these claims be allowed as well.

Concluding Remarks

In view of the foregoing amendments and remarks, the Applicant earnestly solicits a timely issuance of a Notice of Allowance for claims 1-5, 7-14, and 17. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call the Applicant's attorney at the number listed below.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Justin O. Ehresmann
Reg. No. 73,867
626/795-9900

JOE/css

CSS PAS1461385.2-*-04/4/17 10:47 AM

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Justin O. Ehresmann/Anita Johnson
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	200	200
Miscellaneous:				
		Total in USD ($)		**200**

Electronic Acknowledgement Receipt	
EFS ID:	28935821
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Justin O. Ehresmann/Anita Johnson
Filer Authorized By:	Justin O. Ehresmann
Attorney Docket Number:	72827/S1437
Receipt Date:	14-APR-2017
Filing Date:	26-APR-2013
Time Stamp:	20:03:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$200
RAM confirmation Number	041717INTEFSW20050000
Deposit Account	
Authorized User	
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	Transmittal Letter	72827-Trans-Amend.PDF	20087 e9596704edd7fa02c4a24ed4e59964a36a2a9880	no	2
Warnings:					
Information:					
2	Extension of Time	72827-EOT.PDF	17451 dcc1e9db671bff7e7915224661c7578a49dd664d	no	2
Warnings:					
Information:					
3		72827-Amend.PDF	104332 f36b9cef4fb09daa4789d8dcd23828730b3deec6	yes	12

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	5
Applicant Arguments/Remarks Made in an Amendment	6	12

Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30773 ccd689aa4f33807dc8e4565f90cfc71f1b3a31ff	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	172643		

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.

New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
AMENDMENT TRANSMITTAL LETTER

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on April 14, 2017 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Anita G. Johnson

Inventor : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Yang, Kwang-su

Docket No. : 072827

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
April 14, 2017

Commissioner:

Enclosed is an amendment to the above-identified application.

CLAIMS AS AMENDED							
	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra Claims	Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Total Claims	14 -	* 20	= 0	0 x $80.00	$40.00	$20.00	$0.00
Independent Claims	2 -	** 3	= 0	0 x $420.00	$210.00	$105.00	$0.00
Multiple Dependent Claims***				$780.00	$390.00	$195.00	$0.00
						Total Additional Fee	$0.00
List Independent Claims: 1 and 11							
* If the "Highest Number of Total Claims Previously Paid For" is less than 20, enter "20" in this space ** If the "Highest Number of Independent Claims Previously Paid For" is less than 3, enter "3" in this space *** Pay this fee only when "Multiple Dependent Claims" are added for the first time							

__X__ No additional fee is required.
__X__ A Petition for Extension of Time and the required fee are enclosed.

_____ Other enclosures: _____

Amendment Transmittal Letter
Application No. 13/872,018

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by or to give effect to this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Justin O. Ehresmann
Reg. No. 73,867
626/795-9900

JOE/agj
AGJ 101073646.1-*-04/14/2017 4:48 PM

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
PETITION FOR EXTENSION OF TIME
FROM THE OFFICE ACTION

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on April 14, 2017 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Anita G. Johnson

Inventor(s) : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Yang, Kwang-su

Docket No. : 072827

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
April 14, 2017

Commissioner:

Applicant petitions the Commissioner to extend the time for response to the Office action dated December 30, 2016 for one month(s) from March 30, 2017 to April 30, 2017.

The fee for extension of time required by 37 CFR § 1.17 is calculated below.

FEE CALCULATION			
LENGTH OF EXTENSION	LARGE ENTITY	SMALL ENTITY	FEE
WITHIN FIRST MONTH	$200.00	$100.00	$200.00
WITHIN SECOND MONTH	$600.00	$300.00	
WITHIN THIRD MONTH	$1,400.00	$700.00	
WITHIN FOURTH MONTH	$2,200.00	$1,100.00	
WITHIN FIFTH MONTH	$3,000.00	$1,500.00	

Submitted herewith is the fee of $200.00 to cover the cost of the extension.

Petition for Extension of Time
Application No. 13/872,018

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Justin O. Ehresmann
Reg. No. 73,867
626/795-9900

JOE/agj
AGJ 101073584.1-*-04/14/2017 4:41 PM

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/872,018	Filing Date 04/26/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	04/14/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						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 number found in the appropriate box in column 1.

LIE
VIKKI GRAY

This collection of information is required by 37 CFR 1.16. 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, 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		KR 10-2008-0111130	12-22-2008	CAMBRIDGE DISPLAY TECHNOLOGY LIMITED	Korea Patent Abstract

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

EG PAS1461861.1-*-02/3/17 1:37 PM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/eg

Electronic Acknowledgement Receipt

EFS ID:	28264496
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Elizabeth Gomez
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	03-FEB-2017
Filing Date:	26-APR-2013
Time Stamp:	18:52:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_IDS.PDF	72287 38e78f8b15b6a9b6c52ee737ac09bf500b5f a545	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3
Warnings:			
Information:			

2	Foreign Reference	KR_1020080111130.pdf	1314713 9812f80d1049d648c86c54e4183884a7457c8469	no	18
Warnings:					
Information:					
		Total Files Size (in bytes):	1387000		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on February 3, 2017 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Elizabeth Gomez

Inventor(s) : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Kwang-Su Yang

Docket No. : 072827

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT AND CERTIFICATION UNDER § 1.97(e)(1)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
February 3, 2017

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement with a listing of references that are known to applicant. Copies of each of the listed Foreign Patent Documents and Other Documents references are enclosed.

It is respectfully requested that these references be considered in the examination of this application and identified on the list of references cited on the patent issuing on this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No. 13/872,018

Applicant's undersigned attorney hereby certifies, in accordance with 37 CFR § 1.97(e)(1), that each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/eg
Enclosures: Information Disclosure Statement w/references

EG PAS1461082.1-*-02/3/17 11:18 AM

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 12/30/2016
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
12/30/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@lrrc.com
pair_cph@firsttofile.com

Office Action Summary	Application No. 13/872,018	Applicant(s) LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/01/2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-5,7-14,16 and 17* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,7,8,11,12,14,16 and 17* is/are rejected.

8)☒ Claim(s) *9,10 and 13* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/01/2016 has been entered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 11 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

- In claim 11, a limitation "a third length" is indefinite since a limitation "a second length" is not recited in the claim. Therefore, the claim11 is indefinite.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 11 is rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Credelle (U.S. Pub. No. US 2003/0128179 A1).

As to claim 1, Credelle (Figs. 1, 18A and 20) teaches **a pixel arrangement structure** (an octal subpixel grouping; Fig. 18A) **of an organic light emitting diode (OLED) display** (a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14)**, comprising:**

- **a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display** (blue subpixel 102, red subpixel 104, and green subpixel 106; a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14; Fig. 18A) **and comprising:**
- **a first pixel** (a blue subpixel 102) **having a center coinciding with a center of a virtual square** (a virtual square consists of centers of two red subpixels and two green subpixels; Fig. 18A**;**
- **another first pixel** (a blue subpixel in a first row and a fourth column) **having a center coinciding with a center of another virtual square** (another virtual square consists of two green subpixels and two red subpixels; Fig. 18A)**, the virtual squares**

sharing a common side having endpoints at a common first vertex (a center of the green subpixel 106 in a first row and a third column) **and a common second vertex** (a center of the red subpixel 104 in a second row and a third column) **of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light** (red subpixel 104 and green subpixel 106 are located alternately in neighboring vertices in each virtual square; Fig. 18A)**;**

- **a second pixel** (green subpixel in a first row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and having a center at the first vertex** (the center of the green subpixel in a first row and a third column) (Figs. 1 and 18A)**; and**
- **a third pixel** (red subpixel in a second row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and the second pixel** (the green subpixel in a first row and a third column)**, and having a center at the second vertex** (a center of the red subpixel in a second row and a third column) (Figs. 1 and 19A)~~,~~
- **the first pixel, the second pixel, and the third pixel have polygonal shapes** (rectangular shapes; Figs. 1 and 18A)**,**
- **a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length** (the shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104 are same; Fig. 18A)**, and**
- **a shortest distance between the first pixels is a third length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels** (a shortest distance between blue pixels 102 is longer than the

shortest distance between blue pixel 102 and green pixel 106 and the shortest distance between blue pixel 102 and red pixel 104, i.e., a same first length in the above limitation, and a shortest distance between each of green pixels 106 and red pixels 104; Fig. 18A).

Claim Rejections - 35 USC § 103

7. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-5, 12 and 16 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle in view of Koyama (U.S Pub. No. US 2006/0274090 A1).

As to claim 1, Credelle (Figs. 1, 18A and 20) teaches **a pixel arrangement structure** (an octal subpixel grouping; Fig. 18A) **of an organic light emitting diode (OLED) display** (a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14)**, comprising:**

- **a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display** (blue subpixel 102, red subpixel 104, and green subpixel 106; a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14; Fig. 18A) **and comprising:**
- **a first pixel** (a blue subpixel 102) **having a center coinciding with a center of a virtual square** (a virtual square consists of centers of two red subpixels and two green subpixels; Fig. 18A)**;**

- **another first pixel** (a blue subpixel in a first row and a fourth column) **having a center coinciding with a center of another virtual square** (another virtual square consists of two green subpixels and two red subpixels; Fig. 18A)**, the virtual squares sharing a common side having endpoints at a common first vertex** (a center of the green subpixel 106 in a first row and a third column) **and a common second vertex** (a center of the red subpixel 104 in a second row and a third column) **of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light** (red subpixel 104 and green subpixel 106 are located alternately in neighboring vertices in each virtual square; Fig. 18A)**;**
- **a second pixel** (green subpixel in a first row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and having a center at the first vertex** (the center of the green subpixel in a first row and a third column) (Figs. 1 and 18A)**; and**
- **a third pixel** (red subpixel in a second row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and the second pixel** (the green subpixel in a first row and a third column)**, and having a center at the second vertex** (a center of the red subpixel in a second row and a third column) (Figs. 1 and 19A)~~,~~
- **wherein the second pixel and the third pixel have polygonal shapes** (rectangular shapes; Fig. 18A)**.**

Credelle does not teach **wherein the respective first pixels have octagonal shapes that are elongated along respective diagonals toward the second vertex.**

Koyama (Fig. 1) teaches

- **wherein the respective first pixels have octagonal shapes that are elongated along respective diagonals toward the second vertex** (pixels B have octagonal shapes that are elongated along respective diagonals toward the vertex, i.e., center of pixel R; Fig. 1)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used pixel structure with octagonal shapes as taught by Koyama of Credelle because the pixel structure with octagonal shapes provides a user with more visually appealing.

As to claim 2, Credelle teaches

- **wherein the second pixel comprises a pair of second pixels** (a green subpixel in a first row and a third column and a green subpixel in a second row and a first column; Fig. 18A)**, and the second pixels are separated from each other by the first pixel** (the green subpixel in a first row and a third column and the green subpixel in a second row and a first column are separated by the blue subpixel in a first row and a second column) (Figs. 1 and 18A)**.**

As to claim 3, Credelle teaches

- **wherein the third pixel comprises a pair of third pixels** (a red subpixel in a second row and a third column and a red subpixel in a first row and a first column; Fig. 18A)**, and the third pixels are separated from each other by the first pixel** (the red subpixel in a second row and a third column and the red subpixel in a first row and a first column are separated by the blue subpixel in a first row and a second column) (Figs. 1 and 18A)**.**

As to claim 4, Credelle teaches

- **wherein the second pixel comprises a pair of second pixels** (a green subpixel in a first row and a third column and a green subpixel in a second row and a first column; Fig. 18A)**, the third pixel comprises a pair of third pixels** (a red subpixel in a second row and a third column and a red subpixel in a first row and a first column; Fig. 18A)**, and the second pixels and the third pixels enclose the first** pixel (the blue subpixel in a first row and a second column) **in the virtual square** (Figs. 1 and 18A)**.**

As to claim 5, Credelle teaches

- **wherein each of the second pixels and the third pixels is larger in area than the first pixel** (green pixels 106 and red pixels 104 is larger in size than blue pixels 101; Fig. 18A)**.**

As to claim 12, Credelle teaches

- **wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light** (blue, green and red color; Figs. 1 and 18A)**.**

As to claim 16, Credelle teaches

- **wherein the first vertex** (the center of green subpixels) **and the centers of the first pixels (**the blue subpixels) **are collinear** (Figs. 1 and 18A)**, and**
- **wherein the first subpixels are separated from each other by only the second pixel** (the blue subpixels are separated from each other by only green subpixels) (Figs. 1 and 18A)**.**

9. Claims 7-8, 14 and 17 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle, in view of Koyama as applied to claim 1 above, and further in view of Chao (U.S Pub. No. US 2008/0001525 A1).

As to claim 7, Credelle and Koyama teach **the pixel arrangement structure of claim 5.**

Credelle and Koyama do not teach **wherein one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape** (each of the red, green, and blue light emission **zones** 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle as modified by Koyama because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 8, Koyama teaches **wherein**

- **the first pixels are symmetrical to each other** (blue pixels B have octagonal

shapes that are symmetrical to each other; Fig. 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used pixel structure with octagonal shapes as taught by Koyama of Credelle as modified by Chao because the pixel structure with octagonal shapes provides a user with more visually appealing.

As to claim 14, Credelle and Koyama teach **the pixel arrangement structure of claim 5.**

Credelle and Koyama do not teach **wherein the first pixel has an octagonal shape, and at least one of the second pixel and the third pixel has a hexagonal shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **at least one of the second pixel and the third pixel has a hexagonal shape** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle, circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle as modified by Koyama because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 17, Credelle and Koyama teach **the pixel arrangement structure**

of claim 1.

Credelle and Koyama do not expressly teach **wherein the second pixel has a different polygon shape from the third pixel.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches

- **wherein the second pixel has a different polygon shape from the third pixel** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle as modified by Koyama because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

Allowable Subject Matter

10. Claim 9-10 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicants' arguments with respect to claims 1-5, 7-8, 11-12, 14 and 16-17 have been considered but are moot in view of the new grounds of rejection.

In view of amendment, references of Credelle, Koyama, and Chao have been used for the new grounds of rejection.

Therefore, the Office maintains the rejections as recited above.

Inquiry

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang-Su Yang whose telephone number is 571-270-7307. The examiner can normally be reached on Mon-Fri during 9:00am-6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. 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).

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

Notice of References Cited	Application/Control No. 13/872,018	Applicant(s)/Patent Under Reexamination LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	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-2006/0274090 A1	12-2006	Koyama; Jun	G09G3/3258	345/695
	B	US-				
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		8,354,789 B2	01-15-2013	Kim et al.
		2015/0192834 A1	07-09-2015	Morinaga et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		TW I328207	08-01-2010	Chao et al.	Abstract of TW 2008-02221, listed below

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		English Abstract of TW 2008-02221 A, also published as TW I328207, listed above
		TIPO Office Action dated October 11, 2016, for corresponding Taiwanese Patent Application No. 102124953 (6 pages)
		U.S. Office Action dated October 14, 2016 issued in cross-reference U.S. Patent Application No. 13/614,197 (12 pages)

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EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	12/23/2016

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/smv

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

✓	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	06/24/2015	10/12/2015	02/23/2016	06/17/2016	08/29/2016	12/23/2016			
	1	✓	✓	✓	✓	✓	✓			
	2	✓	✓	✓	✓	✓	✓			
	3	✓	✓	✓	✓	✓	✓			
	4	✓	✓	✓	✓	✓	✓			
	5	✓	✓	✓	✓	✓	✓			
	6	N	-	-	-	-	-			
	7	✓	✓	✓	✓	✓	✓			
	8	✓	✓	✓	✓	✓	✓			
	9	✓	✓	✓	✓	✓	O			
	10	✓	✓	✓	✓	✓	O			
	11	O	O	✓	O	O	✓			
	12	✓	✓	✓	✓	✓	✓			
	13	✓	✓	✓	✓	✓	O			
	14	✓	✓	✓	✓	✓	✓			
	15		✓	-	-	-	-			
	16		✓	✓	✓	✓	✓			
	17		✓	✓	✓	✓	✓			

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S59	3	"7236196".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 16:32
S60	3	"20140035971".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 16:45
S61	2	"20030128179".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 16:48
S62	0	pentile same octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 17:11
S63	52	pentile and octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 17:11
S64	270	(organic adj light OLED) and square near3 lattice and red same green same blue	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 17:16
S65	3	S64 and octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 17:16
S66	7	(organic adj light OLED) and square near3 lattice and octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 17:17
S67	0	("9508285").URPN.	USPAT	OR	ON	2016/12/23 17:25
S68	0	("9355601").URPN.	USPAT	OR	ON	2016/12/23 17:25
S69	10	blue adj (pixel sub$1pixel) with octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 17:27

S70	31	blue adj (pixel sub$1pixel) same octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 17:32
S71	61	pentile adj (pixel sub$1pixel)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 17:43
S72	12	("20020025406" | "20040003775" | "20050109273" | "20060024444").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 17:49
S73	3	"7728881".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 17:53
S74	9	("20020025069" | "20020113195" | "20030184652" | "20040061790" | "20040262493" | "20050231620" | "6480625" | "6630956" | "6934050").PN. OR ("7728881").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/23 17:54
S75	8	("20120056531" "20140077189" "20040252088").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 18:13
S76	13	lattice with (pixel sub$1pixel) same octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 19:48
S77	52	pentile and octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 19:51
S78	49	pentile and shape with (pixel sub$1pixel) and octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 19:59
S79	24	blue with (pixel sub$1pixel) with octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 20:01
S80	62	blue with (pixel sub$1pixel) same octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 20:11
S81	12	bayer adj pattern same octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2016/12/23 20:15

			IBM_TDB			
S82	0	pentile same octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 20:18
S83	52	pentile and octagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 20:18
S84	10	("20020186214" | "20040113875" | "20040201558" | "20110291550" | "6771028").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 20:19
S85	174	"345".clas. and octagon$3 same (pixel sub$1pixel)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 20:37
S86	2	"20090322215".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/23 21:12

EAST Search History (Interference)

< This search history is empty>

12/ 23/ 2016 10:46:16 PM
C:\ Users\ kyang\ Documents\ EAST\ Workspaces\ 13872018.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

CPC- SEARCHED		
Symbol	Date	Examiner
G09G3/3208 H01L27/3216 H01L27/3218	06/23/2015	KY

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST: Inventor Search and Assignee Search	06/23/2015	KY
EAST: Text Search	06/23/2015; 06/24/2015	KY
EAST: IDS Search	10/12/2015	KY
EAST: Updated Text Search	02/22/2016; 02/23/2016	KY
EAST: IDS Search	06/17/2016	KY
EAST: Updated Text Search	07/26/2016; 08/29/2016	KY
EAST: Updated Text Search	12/23/2016	KY

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/KWANG-SU YANG/ Primary Examiner.Art Unit 2691

REQUEST FOR CONTINUED EXAMINATION (RCE) TRANSMITTAL

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on December 1, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Si Vuong

Application Number	:	13/872,018	Confirmation No. 4833
Filing Date	:	April 26, 2013	
Inventor(s)	:	Sang-Shin Lee	
Title	:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Group Art Unit	:	2691	
Examiner Name	:	Kwang-Su Yang	
Docket No.	:	**72827**	Date: December 1, 2016

MAIL TO: Mail Stop RCE

This is a Request for Continued Examination (RCE) under 37 CFR § 1.114 of the above-identified application.

This application is **not** an application of the kind specified in 37 CFR § 1.114(e).

1. THE STATUS OF THE APPLICATION IS AS FOLLOWS:
   a. __X__ Pending (no review proceedings active)
      (1) __X__ An Action was mailed by the Office on September 2, 2016, as to which no appeal under 37 CFR § 1.191 has been filed and
         __X__ a response under 37 CFR § 1.116 was filed on November 2, 2016
            _____ via Express Mail
            __X__ with certificate of electronic transmission under 37 CFR § 1.8
         __X__ that Action was a Final Rejection, the finality of which is to be withdrawn by this Request
         _____ an appeal or civil action under 35 U.S.C. 141,145 or 146 has been terminated
      (2) _____ Allowed: the Notice of Allowance was mailed by the Office on
         _____ the Issue Fee has not been paid
         _____ the Issue Fee has been paid **and** a petition under 37 CFR § 1.313 was granted on
   b. _____ Pending (with review proceeding active)
      An appeal under 37 CFR § 1.191 has been filed. **Applicant(s) hereby withdraw that appeal and request reopening of the prosecution of the application.**
2. SUBMISSION(S) REQUIRED (check at least one)
   a. Previously submitted
      __X__ Consider the amendments/reply under 37 CFR § 1.116 previously filed on November 2, 2016
      _____ Consider the arguments in the Appeal or Reply Brief previously filed on
      _____ Other:

REQUEST FOR CONTINUED EXAMINATION (RCE)
TRANSMITTAL

Application No. 13/872,018

b. Enclosed

____	Amendment/Reply
____	Affidavit(s)/Declaration(s)
__X__	Information Disclosure Statement
____	Documents under 37 CFR § 1.48
____	Petition for Extension of Time
__X__	Other: Form SB08A/B with References

Please direct all correspondence to **CUSTOMER NUMBER 23363**. Direct telephone calls to 626/795-9900, **LEWIS ROCA ROTHGERBER CHRISTIE LLP, P.O. Box 29001, Glendale, CA 91209-9001**.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/smv

REQUEST FOR CONTINUED EXAMINATION (RCE)
FEE CALCULATION SHEET

Application No. 13/872,018

PART I -- BASIC FILING FEE							
				Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Basic Filing Fee				1,700.00	850.00	425.00	1,700.00
PART II -- ADDITIONAL CLAIMS (compared to application before RCE)							
	Claims Remaining After Amendment	Highest Number Paid For	Number Extra Claims	Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Total Claims	15 -	* 20	= 0	x 80.00	40.00	20.00	0
Independent Claims	2 -	** 3	= 0	x 420.00	210.00	105.00	0
First Presentation of Multiple Dependent Claims				780.00	390.00	195.00	0
TOTAL FILING FEE							$1,700.00
LIST INDEPENDENT CLAIMS: 1 and 11							
* IF THE "HIGHEST NUMBER OF TOTAL CLAIMS PREVIOUSLY PAID FOR" IS 20 OR LESS, WRITE "20" IN THIS SPACE ** IF HIGHEST NUMBER OF INDEPENDENT CLAIMS PREVIOUSLY PAID FOR IS 3 OR LESS, WRITE "3" IN THIS SPACE							

1. FEES *(The RCE fee under 37 CFR § 1.17(e) is required by 37 CFR § 1.114 when the RCE is filed.)*

   a. Amount (total from Fee Calculation Sheet)

   The fee of $1,700.00 is submitted herewith.

   b. __X__ The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required for this transaction to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on December 1, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Si Vuong

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
December 1, 2016

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. Copies of each of the listed Foreign Patent Documents and Other Documents references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No. 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/smv
Enclosures: Information Disclosure Statement, w/references

EG PAS1449937.1-*-12/1/16 9:34 AM

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		8,354,789 B2	01-15-2013	Kim et al.
		2015/0192834 A1	07-09-2015	Morinaga et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		TW I328207	08-01-2010	Chao et al.	Abstract of TW 2008-02221, listed below

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		English Abstract of TW 2008-02221 A, also published as TW I328207, listed above
		TIPO Office Action dated October 11, 2016, for corresponding Taiwanese Patent Application No. 102124953 (6 pages)
		U.S. Office Action dated October 14, 2016 issued in cross-reference U.S. Patent Application No. 13/614,197 (12 pages)

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EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/smv

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Young E. Jeon/Si Vuong
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	1700	1700
		Total in USD ($)		**1700**

Electronic Acknowledgement Receipt	
EFS ID:	27667598
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Si Vuong
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	01-DEC-2016
Filing Date:	26-APR-2013
Time Stamp:	15:45:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1700
RAM confirmation Number	120216INTEFSW15461900
Deposit Account	
Authorized User	
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		72827_RCE_IDS_111416.pdf	577691 535c8450ced41c21385263929a1f31619fb885e0	yes	6
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Request for Continued Examination (RCE)		1	3	
	Transmittal Letter		4	5	
	Information Disclosure Statement (IDS) Form (SB08)		6	6	
Warnings:					
Information:					
2	Foreign Reference	TW_I328207B.pdf	5698228 4fa19c27cdda753b9f91d75454f7fc667873943c	no	42
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	TW_OA.pdf	567120 ab3c628a7062c56f3fa245e5edb4e80f9736703f	no	6
Warnings:					
Information:					
4	Other Reference-Patent/App/Search documents	69657_OA_10_14_2016.pdf	370122 8b4747f3960656e2a4ed5c8544f33895db9e28f9	no	12
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30455 323d3359c3c21047f9297f0918042ef374a1cc12	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	7243616

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/872,018	Filing Date 04/26/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	12/01/2016	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						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 number found in the appropriate box in column 1.

SLIE
JULIET MCMILLAN

This collection of information is required by 37 CFR 1.16. 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, 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 11/14/2016
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
11/14/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@lrrc.com
pair_cph@firsttofile.com

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 13/872,018	**Applicant(s)** LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	**Art Unit** 2691	**AIA (First Inventor to File) Status** No

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

THE REPLY FILED 02 November 2016 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance;
(2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires _____months from the mailing date of the final rejection.
   b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.
   Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: *See Continuation Sheet*. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): (a) ☒ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:
_____.
13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
14. ☒ Other: Attachment PTOL2323.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:
Claim(s) allowed: .
Claim(s) objected to: 11.
Claim(s) rejected: 1-5,7-10,12-14,16 and 17.
Claim(s) withdrawn from consideration: .

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

Continuation of 3. NOTE: The amended limitations in claims 1, 7, 8, 11, and 14 change the scope of the claims, which raise new issues that would require further consideration and/or search, since they were not presented before.

BOE
Exhibit 1027 Page 347

AFCP 2.0 Decision	Application No.	Applicant(s)
	13/872,018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

This is in response to the After Final Consideration Pilot request filed 02 November 2016.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

   ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.

   ☐ A non-broadening amendment to at least one independent claim was not submitted.

   ☐ A proper AFCP 2.0 request was submitted in response to the most recent final rejection.

   ☐ Other:

2. **Proper Request**

   A. After final amendment submitted with the request will not be treated under AFCP 2.0.
   The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

   ☒ The after final amendment will be treated under pre-pilot procedure.

   B. Updated search and/or completed additional consideration.
   The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

   ☐ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.

   ☐ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action. See attached interview summary for further details.

   ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.

   ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.

   ☐ 5. Other:

   Examiner Note: Please attach an interview summary when necessary as described above.

NOT ENTER
/KY/
11/07/2016

PATENT
RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2691

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on November 2, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Vickie D. Wall

Vickie D. Wall

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Yang, Kwang-Su	
Docket No.	: 072827	
Customer No.	: 23363	

AMENDMENT AFTER FINAL UNDER AFCP 2.0

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
November 2, 2016

Commissioner:

In response to the Office action of September 2, 2016, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

PATENT
RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2691

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AMENDMENT AFTER FINAL UNDER AFCP 2.0

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November 2, 2016

Commissioner:

In response to the Office action of September 2, 2016, please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

wherein the respective first pixels have octagonal shapes that are elongated along respective diagonals toward the second vertex, and

~~the first pixel, the second pixel,~~ the second pixel and the third pixel have polygonal shapes.

2. (Original) The pixel arrangement structure of claim 1, wherein
the second pixel comprises a pair of second pixels, and
the second pixels are separated from each other by the first pixel.

3. (Original) The pixel arrangement structure of claim 1, wherein
the third pixel comprises a pair of third pixels, and
the third pixels are separated from each other by the first pixel.

4. (Original) The pixel arrangement structure of claim 1, wherein
the second pixel comprises a pair of second pixels,
the third pixel comprises a pair of third pixels, and
the second pixels and the third pixels enclose the first pixel in the virtual square.

5. (Original) The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

6. (Canceled)

7. (Currently Amended) The pixel arrangement structure of claim 5, wherein
~~the first pixel has an octagonal shape, and~~
one of the second pixel and the third pixel has a hexagonal shape and another of the second pixel and the third pixel has a quadrilateral shape.

8. (Currently Amended) The pixel arrangement structure of claim 7, wherein the first pixels ~~have octagonal shapes that~~ are symmetrical to each other.

9. (Original) The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. (Previously Presented) The pixel arrangement structure of claim 9, wherein a shortest distance between the first pixel and the second pixels as well as a shortest distance between the first pixel and the third pixels is a same first length.

11. (Currently Amended) A [[The]] pixel arrangement structure of ~~claim 10, wherein~~ of an organic light emitting diode (OLED) display, comprising:

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

the first pixel, the second pixel, and the third pixel have polygonal shapes,

a shortest distance between the first pixel and the second pixel as well as a shortest distance between the first pixel and the third pixel is a same first length, and

a shortest distance between the first pixels is a third length that is longer than the first length and a shortest distance between each of the second pixels and the third pixels.

12. (Original) The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. (Previously Presented) The pixel arrangement structure of claim 1, wherein

the first pixel is configured to emit green light,

one of the second pixel and the third pixel is configured to emit blue light, and

another of the second pixel and the third pixel is configured to emit red light.

14. (Currently Amended) The pixel arrangement structure of claim 5, wherein

~~the first pixel has an octagonal shape, and~~

at least one of the second pixel and the third pixel has a hexagonal shape.

15. (Canceled)

16. (Previously Presented) The pixel arrangement structure of claim 1, wherein the first vertex and the centers of the first pixels are collinear, and wherein the first pixels are separated from each other by only the second pixel.

17. (Previously Presented) The pixel arrangement structure of claim 1, wherein the second pixel has a different polygonal shape from the third pixel.

REMARKS/ARGUMENTS

Claims 1-5, 7-14, and 16-17 are pending in the present application, of which claims 1 and 11 are independent. Claim 1 has been amended herein to recite selected features of claims 7, 8, and 14, which have been accordingly amended. Support for additional amendments to claim 1 can be found, for example, at paragraphs [00109] and FIG. 6 of the application as originally filed. Claim 11 has been amended herein to incorporate features of previous claims 1 and 10 and to place claim 11 in independent form. Claims 6 and 15 were previously canceled. Applicant respectfully requests reconsideration and allowance of claims 1-5, 7-14, and 16-17.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-4, 12, and 16 were rejected under pre-AIA 35 U.S.C. §102(b) as allegedly anticipated by Credelle et al. (U.S. Patent Publication 2003/0128179 A1, hereafter "Credelle"). In an effort to advance the prosecution of the present application, Applicant has amended claim 1 to recite additional features, some of which were recited in claims 7, 8, and 14 or are supported in paragraphs [00109] and FIG. 6 of the application as originally filed. Specifically, claim 1 is amended to recite, in relevant part, "wherein the respective first pixels have octagonal shapes that are elongated along respective diagonals toward the second vertex". As stated on page 7 of the Office action, Credelle does not teach "wherein the first pixel has an octagonal shape". Indeed, Credelle appears to disclose only pixels having rectangular shapes. *See* e.g., Credelle, FIG. 1, 5-7, 17-19B. Accordingly, Credelle does not anticipate claim 1.

For at least the reasons provided above, Applicant respectfully requests that the rejection of claim 1 be withdrawn and that this claim be allowed. Further, because claims 2-3, 12, and 16 depend, directly or indirectly, from claim 1, they each incorporate all the terms and features of claim 1 in addition to other features, which together further patentably distinguish the claim over the cited references. Therefore, Applicant

respectfully requests that the rejection of claims 2-3, 12, and 16 be withdrawn and that these claims be allowed as well.

Claim Rejections Under 35 U.S.C. § 103

Claim 13 was rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Satou et al. (U.S. Patent Publication 2010/0171440 A1, hereafter "Satou").

Claim 17 was rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Chao et al. (U.S. Patent Publication 2008/0001525 A1, hereafter "Chao").

Claim 5 was rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Koo et al. (U.S. Patent Publication 2008/0001527 A1, hereafter "Koo").

Claims 7 and 14 were rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Koo and further in view of Chao.

Claim 8 was rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Koo, Chao, and further in view of Satou.

Claim 9 was rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Koo and Chao, and further in view of Louwsma et al. (U.S. Patent Publication 2008/0308819 A1, hereafter "Louwsma").

Claim 10 was rejected under pre-AIA 35 U.S.C. §103(a) as allegedly unpatentable over Credelle in view of Koo, Chao, and Louwsma, and further in view of Satou.

Applicant respectfully traverses these rejections. As discussed above, claim 1 is allowable over Credelle. The cited references of Satou, Koo, Louwsma, and Chao, alone or in combination, do not appear to remedy the deficiencies of Credelle in disclosing "wherein the respective first pixels have octagonal shapes that are elongated along respective diagonals toward the second vertex". Specifically, Satou appears to

disclose only pixels having hexagonal or square shapes. *See*, e.g., Satou, FIG. 6a-b. Similarly, Koo and Louwsma appear to disclose only pixels having rectangular shapes. *See*, e.g., Koo, FIG. 1 and Louwsma, FIG. 1a. Although Chao discloses that "each of the emission zones 150, 160, and 170 may be formed in any geometrical shape, including square, rectangle, circle, triangle, trapezoid, polygon", Chao does *not* appear to specifically disclose or teach a pixel having the shape of an octagon. Chao, paragraph [0033]. Given that Chao discloses example embodiments using only pixels having rectangular shapes (Chao, FIGS. 1, 2, 3, and 5), and a single example embodiment using a concave polygon similar in shape to a rectangle (Chao, FIG. 4), it is unlikely that a person of ordinary skill in the art would have selected the specific octagonal shape recited in claim 1 and described in FIG. 6 from the wide and vague disclosure of a "polygon" as disclosed by Chao. Furthermore, in each of these embodiments, the pixels are not elongated along respective diagonals toward a second vertex.

Accordingly, claim 1 should be allowable over Credelle, Satou, Koo, Chao, and Louwsma, as none of these references, alone or in combination, teach "wherein the respective first pixels have octagonal shapes that are elongated along respective diagonals toward the second vertex". Because claims 5, 7-10, 13, 14, and 17 each depend, directly or indirectly, from claim 1, they each incorporate all the terms and features of claim 1 in addition to other features, which together further patentably distinguish the claim over the cited references. Therefore, Applicant respectfully requests that the rejections of claims 5, 7-10, 13, 14, and 17 be withdrawn and that these claims be allowed as well.

Allowable Claims

Applicant thanks the Examiner for indicating that claim 11 would be allowable if rewritten in independent form including all of the limitations of the base claim and intervening claims. Applicant has amended claim 11 herein to recite all the features of

original claims 1 and 10 to place the claims in independent form. Therefore, Applicant respectfully requests that claim 11 now be allowed.

Concluding Remarks

In view of the foregoing amendments and remarks, the Applicant earnestly solicits a timely issuance of a Notice of Allowance for claims 1-5, 7-14, and 16-17. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call the Applicant's attorney at the number listed below.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Justin O. Ehresmann
Reg. No. 73,867
626/795-9900

JOE/css

VDW PAS1440200.2-*-11/2/16 3:00 PM

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
072827	13/872,018	April 26, 2013
First Named Inventor:	Title:	
Sang-Shin Lee	Pixel Arrangement Structure for Organic Light Emitting Diode Display	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:
   - Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
   - The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
     - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
     - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
       - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
       - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date
/Justin O. Ehresmann/	November 2, 2016
Name (Print/Typed) Justin O. Ehresmann	Practitioner Registration No. 73867

***Note**: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

☐ * Total of _____ forms are submitted.

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.

Electronic Acknowledgement Receipt

EFS ID:	27403498
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Justin O. Ehresmann/Vickie D. Wall
Filer Authorized By:	Justin O. Ehresmann
Attorney Docket Number:	72827/S1437
Receipt Date:	02-NOV-2016
Filing Date:	26-APR-2013
Time Stamp:	21:12:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	072827_AmendTransmittal.pdf	56167 63fdcfd50704c9819dbbb9f1d90fce37be948d1c	no	2

Warnings:

Information:					
2		072827_AAF.pdf	339013 fc2418123539a68fb9748a13ff1fb08e3fefa580	yes	9
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Response After Final Action		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	9	
Warnings:					
Information:					
3	After Final Consideration Program Request	072827_sb0434.pdf	226428 15e6b826f1d9723260e3b6b88e983b793e311494	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	621608		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
AMENDMENT TRANSMITTAL LETTER

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office on November 2, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Vickie D. Wall

Vickie D. Wall

Inventor : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Kwang-Su Yang

Docket No. : 072827

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
November 2, 2016

Commissioner:

Enclosed is an amendment to the above-identified application.

CLAIMS AS AMENDED							
	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra Claims	Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Total Claims	15 -	* 20	= 0	0 x $80.00	$40.00	$20.00	$0.00
Independent Claims	2 -	** 3	= 0	0 x $420.00	$210.00	$105.00	$0.00
Multiple Dependent Claims***				$780.00	$390.00	$195.00	$0.00
						Total Additional Fee	$0.00
List Independent Claims: 1 and 11							
* If the "Highest Number of Total Claims Previously Paid For" is less than 20, enter "20" in this space ** If the "Highest Number of Independent Claims Previously Paid For" is less than 3, enter "3" in this space *** Pay this fee only when "Multiple Dependent Claims" are added for the first time							

__X__ No additional fee is required.

_____ A Petition for Extension of Time and the required fee are enclosed.

__X__ Other enclosures: Form PTO/SB/434, Certification and Request for Consideration Under the After Final Consideration Pilot Program 2.0

Amendment Transmittal Letter
Application No. 13/872,018

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by or to give effect to this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Justin O. Ehresmann
Reg. No. 73,867
626/795-9900

JOE/vdw

VDW PAS1447706.1-*-11/2/16 3:46 PM

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/872,018	Filing Date 04/26/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	11/02/2016	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						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 number found in the appropriate box in column 1.

LIE
MARCIA GORDON

This collection of information is required by 37 CFR 1.16. 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, 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.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 09/02/2016
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
09/02/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@lrrc.com
pair_cph@firsttofile.com

Office Action Summary	Application No. 13/872,018	Applicant(s) LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08/12/2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-5,7-14,16 and 17* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,7-10,12-14,16 and 17* is/are rejected.

8)☒ Claim(s) *11* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Response to Amendment

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 12 and 16 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Credelle (U.S. Pub. No. US 2003/0128179 A1).

As to claim 1, Credelle (Figs. 1, 18A and 20) teaches **a pixel arrangement structure** (an octal subpixel grouping; Fig. 18A) **of an organic light emitting diode (OLED) display** (a display technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14)**, comprising:**

- **a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display** (blue subpixel 102, red subpixel 104, and green subpixel 106; a display

technology such as an Organic Light Emitting Diode (OLED); [0047], lines 8-14; Fig. 18A) **and comprising:**

- **a first pixel** (a blue subpixel 102) **having a center coinciding with a center of a virtual square** (a virtual square consists of centers of two red subpixels and two green subpixels; Fig. 18A**;**

- **another first pixel** (a blue subpixel in a first row and a fourth column) **having a center coinciding with a center of another virtual square** (another virtual square consists of two green subpixels and two red subpixels; Fig. 18A)**, the virtual squares sharing a common side having endpoints at a common first vertex** (a center of the green subpixel 106 in a first row and a third column) **and a common second vertex** (a center of the red subpixel 104 in a second row and a third column) **of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light** (red subpixel 104 and green subpixel 106 are located alternately in neighboring vertices in each virtual square; Fig. 18A)**;**

- **a second pixel** (green subpixel in a first row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and having a center at the first vertex** (the center of the green subpixel in a first row and a third column) (Figs. 1 and 18A)**; and**

- **a third pixel** (red subpixel in a second row and a third column) **separated** (Fig. 1 show separation among subpixels) **from the first pixels** (the blue subpixels in a first row and a second/fourth column) **and the second pixel** (the green subpixel in a first row and a third column)**, and having a center at the second vertex** (a center of the red subpixel in a second row and a third column) (Figs. 1 and 19A)~~,~~

- **wherein the first pixel, the second pixel, and the third pixel have polygonal shapes** (rectangular shapes; Figs. 1 and 18A)**.**

As to claim 2, Credelle teaches

- **wherein the second pixel comprises a pair of second pixels** (a green subpixel in a first row and a third column and a green subpixel in a second row and a first column; Fig. 18A)**, and the second pixels are separated from each other by the first pixel** (the green subpixel in a first row and a third column and the green subpixel in a second row and a first column are separated by the blue subpixel in a first row and a second column) (Figs. 1 and 18A)**.**

As to claim 3, Credelle teaches

- **wherein the third pixel comprises a pair of third pixels** (a red subpixel in a second row and a third column and a red subpixel in a first row and a first column; Fig. 18A)**, and the third pixels are separated from each other by the first pixel** (the red subpixel in a second row and a third column and the red subpixel in a first row and a first column are separated by the blue subpixel in a first row and a second column) (Figs. 1 and 18A)**.**

As to claim 4, Credelle teaches

- **wherein the second pixel comprises a pair of second pixels** (a green subpixel in a first row and a third column and a green subpixel in a second row and a first column; Fig. 18A)**, the third pixel comprises a pair of third pixels** (a red subpixel in a second row and a third column and a red subpixel in a first row and a first column; Fig. 18A)**, and the second pixels and the third pixels enclose the first** pixel (the blue subpixel in a first row and a second column) **in the virtual square** (Figs. 1 and 18A)**.**

As to claim 12, Credelle teaches

- **wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light** (blue, green and red color; Figs. 1 and 18A)**.**

As to claim 16, Credelle teaches

- **wherein the first vertex** (the center of green subpixels) **and the centers of the first pixels (**the blue subpixels) **are collinear** (Figs. 1 and 18A)**, and**
- **wherein the first subpixels are separated from each other by only the second pixel** (the blue subpixels are separated from each other by only green subpixels) (Figs. 1 and 18A)**.**

Claim Rejections - 35 USC § 103

5. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 13 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle in view of Satou (U.S Pub. No. US 2010/0171440 A1).

As to claim 13, Credelle teaches **the pixel arrangement structure of claim 1.**

Credelle does not teach **wherein the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and another of the second pixel or the third pixel is configured to emit red light.**

Satou (Fig. 6(a)) teaches

- **wherein the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and another of the second pixel or the third pixel is configured to emit red light** (G in the point (2, 2), R in the point (3, 1), and B in the point (3, 3); Fig. 6(a))**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used pixel structure with octagonal shapes as taught by Satou in a subpixel grouping of Credelle because the pixel structure with octagonal shapes provides more compact than that with rectangular shape.

7. Claim 17 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle in view of Chao (U.S Pub. No. US 2008/0001525 A1).

As to claim 17, Credelle teaches **the pixel arrangement structure of claim 1.**

Credelle does not teach **wherein the second pixel has a different polygon shape from the third pixel.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches

- **wherein the second pixel has a different polygon shape from the third pixel** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

8. Claim 5 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle in view of Koo (U.S Pub. No. US 2008/0001527 A1).

As to claim 5, Credelle teaches **the pixel arrangement structure of claim 4.**

Credelle does not teach **wherein each of the second pixels and the third pixels is larger in area than the first pixel.**

Koo (Fig. 1) teaches

- **wherein each of the second pixels and the third pixels is larger in area than the first pixel** (the light emitting areas of the R unit pixel or the B unit pixel are larger than the light emitting areas of the G unit pixel; [0013], lines 8-13)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different sizes of light emitting areas as taught by Koo in a subpixel grouping of Credelle because different sizes of light emitting areas can generate the same luminance from the R, G and B unit pixels.

9. Claims 7 and 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle, in view of Koo as applied to claim 5 above, and further in view of Chao.

As to claim 7, Credelle and Koo teach **the pixel arrangement structure of claim 5.**

Credelle and Koo do not teach **wherein the first pixel has an octagonal shape, and one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **the first pixel has an octagonal shape, one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape** (each of the red, green, and blue light emission **zones** 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a subpixel grouping of Credelle as modified by Koo because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 14, Credelle and Koo teach **the pixel arrangement structure of claim 5.**

Credelle and Koo do not teach **wherein the first pixel has an octagonal shape, and at least one of the second pixel and the third pixel has a hexagonal shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **the first pixel has an octagonal shape, and at least one of the second pixel and the third pixel has a hexagonal shape** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle, circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission

zones as taught by Chao in a subpixel grouping of Credelle as modified by Koo because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

10. Claim 8 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle in view of Koo as applied to claim 5 above, in view of Chao as applied to claim 7, and further in view of Satou.

As to claim 8, Credelle, Koo, and Chao teaches **the pixel arrangement structure of claim 7.**

Credelle, Koo and Chao do not teach **wherein the first pixels have octagonal shapes that are symmetrical to each other.**

Satou (Fig. 6(a)) teaches **wherein**

- **the first pixels have octagonal shapes that are symmetrical to each other** (G's have octagonal shapes that are symmetrical to each other; Fig. 6(a))**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used pixel structure with octagonal shapes as taught by Satou in a subpixel grouping of Credelle as modified by Koo and Chao because the pixel structure with octagonal shapes provides more compact than that with rectangular shape.

11. Claim 9 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle in view of Koo as applied to claim 5 above, in view of Chao as applied to claim 7, and further in view of Louwsma (U.S Pub. No. US 2008/0308819 A1).

As to claim 9, Credelle, Koo and Chao teach **the pixel arrangement structure of claim 7.**

Credelle, Koo and Chao do not teach **wherein each of the second pixels is larger in area than each of the third pixels.**

Louwsma (Figs. 1, 2 and 5) teaches

- **wherein each of the second pixels is larger in area than each of the third pixels** (if a red color radiation emitted by the red color layer R has a relatively low intensity in comparison to the blue color, the area of the red color LED element R can be chosen larger than the area size of the blue LED element; [0051], lines 7-16)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different area sizes as taught by Louwsma in a subpixel grouping of Credelle as modified by Koo and Chao and because the pixel size of the blue component relative to the red or green may be larger to cause the pixel elements to age at a common rate.

12. Claim 10 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Credelle in view of Koo as applied to claim 5 above, in view of Chao as applied to claim 7, in view of Louwsma as applied to claim 9 above, and further in view of Satou.

As to claim 10, Credelle, Koo, Chao and Louwsma teach **the pixel arrangement structure of claim 9.**

Credelle, Koo, Chao and Louwsma do not teach **wherein a shortest distance between the first pixel and the second pixels as well as a shortest distance between the first pixel and the third pixels is a same first length.**

Satou (Fig. 6(a)) teaches

- **wherein a shortest distance between the first pixel and the second pixels as well as a shortest distance between the first pixel and the third pixels is a same first length** (Fig. (6a))**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used pixel structure with octagonal shapes as taught by Satou in a subpixel grouping of Credelle as modified by Koo, Chao, and Louwsma because the pixel structure with octagonal shapes provides more compact than that with rectangular shape.

Allowable Subject Matter

13. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

14. Applicants' arguments with respect to claims 1-5, 7-10, 12-14 and 16-17 have been considered but are moot in view of the new grounds of rejection.

In view of amendment, references of Credelle, Koo, Chao, Louwsma, and Satou have been used for the new grounds of rejection.

Therefore, the Office maintains the rejections as recited above.

Conclusion

15. Applicant's amendment necessitated the new grounds of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiry

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang-Su Yang whose telephone number is 571-270-7307. The examiner can normally be reached on Mon-Fri during 9:00am-6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. 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).

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

Notice of References Cited	Application/Control No. 13/872,018	Applicant(s)/Patent Under Reexamination LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	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-2003/0128179 A1	07-2003	Credelle, Thomas Lloyd	G02F1/133514	345/88
	B	US-				
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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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08/29/2016

PATENT
RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2691

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on August 12, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Marti Carrillo

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 072827	
Customer No.	: 23363	

AMENDMENT AFTER FINAL ACTION

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
August 12, 2016

Commissioner:

In response to the final Office action of June 23, 2016 (hereinafter "the Office action"), please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2011/0291550 A1	12-01-2011	Kim et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		KR 10-2011-0129531	12-02-2011	Kim et al.	Corresponds to U.S. Publication 2011/0291550 listed above

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		KIPO Office action dated July 11, 2016, with English translation, for corresponding Korean Patent application 10-2016-0047800, (11 pages)

DLG PAS1430726.1-*-07/21/16 9:37 AM

EXAMINER SIGNATURE	/KWANG-SU YANG/	DATE CONSIDERED	08/29/2016

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/dg

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

✓	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	06/24/2015	10/12/2015	02/23/2016	06/17/2016	08/29/2016				
	1	✓	✓	✓	✓	✓				
	2	✓	✓	✓	✓	✓				
	3	✓	✓	✓	✓	✓				
	4	✓	✓	✓	✓	✓				
	5	✓	✓	✓	✓	✓				
	6	N	-	-	-	-				
	7	✓	✓	✓	✓	✓				
	8	✓	✓	✓	✓	✓				
	9	✓	✓	✓	✓	✓				
	10	✓	✓	✓	✓	✓				
	11	O	O	✓	O	O				
	12	✓	✓	✓	✓	✓				
	13	✓	✓	✓	✓	✓				
	14	✓	✓	✓	✓	✓				
	15		✓	-	-	-				
	16		✓	✓	✓	✓				
	17		✓	✓	✓	✓				

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S53	1011	(organic adj light OLED) and square same red same green same blue	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 11:45
S54	84	(organic adj light OLED) and square adj3 (lattice grid) same red same green same blue	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 11:45
S55	2	("8348456").URPN.	USPAT	OR	ON	2016/07/26 11:58
S56	2	("8348456").URPN.	USPAT	OR	ON	2016/07/26 11:58
S57	9	("20020070909" | "5144288" | "20050083246" | "6326981" | "20050174363" | "20020063701" | "20020186214" | "20060033422" | "20030132709" | "20050057172" | "6275274" | "20040108818" | "20020186214" | "5966189" | "20050046349" | "6518709" | "6614498" | "20040080479" | "6768482" | "20020167268" | "6660332" | "6914649").PN.	USPAT	OR	ON	2016/07/26 12:00
S58	56	("20020070909" | "5144288" | "20050083246" | "6326981" | "20050174363" | "20020063701" | "20020186214" | "20060033422" | "20030132709" | "20050057172" | "6275274" | "20040108818" | "20020186214" | "5966189" | "20050046349" | "6518709" | "6614498" | "20040080479" | "6768482" | "20020167268" | "6660332" | "6914649").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/07/26 12:00
S59	2	"20030193580".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/08/29 13:56
S60	2	"20030128179".pn.	US-PGPUB; USPAT; USOCR;	OR	ON	2016/08/29 14:03

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S61	25	"2006309182" "20110129531" "2008015521"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/08/29 14:28
S62	3	"JP 2006-309182"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/08/29 14:35

EAST Search History (Interference)

< This search history is empty>

8/ 29/ 2016 7:22:06 PM
C:\ Users\ kyang\ Documents\ EAST\ Workspaces\ 13872018.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

CPC- SEARCHED		
Symbol	Date	Examiner
G09G3/3208 H01L27/3216 H01L27/3218	06/23/2015	KY

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST: Inventor Search and Assignee Search	06/23/2015	KY
EAST: Text Search	06/23/2015; 06/24/2015	KY
EAST: IDS Search	10/12/2015	KY
EAST: Updated Text Search	02/22/2016; 02/23/2016	KY
EAST: IDS Search	06/17/2016	KY
EAST: Updated Text Search	07/26/2016; 08/29/2016	KY

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/KWANG-SU YANG/ Primary Examiner.Art Unit 2691

PATENT
RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2691

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on August 12, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Marti Carrillo

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 072827	
Customer No.	: 23363	

AMENDMENT AFTER FINAL ACTION

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
August 12, 2016

Commissioner:

In response to the final Office action of June 23, 2016 (hereinafter "the Office action"), please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously presented) A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

wherein the first pixel, the second pixel, and the third pixel have polygonal shapes.

2. (Original) The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels, and

the second pixels are separated from each other by the first pixel.

3. (Original) The pixel arrangement structure of claim 1, wherein
the third pixel comprises a pair of third pixels, and
the third pixels are separated from each other by the first pixel.

4. (Original) The pixel arrangement structure of claim 1, wherein
the second pixel comprises a pair of second pixels,
the third pixel comprises a pair of third pixels, and
the second pixels and the third pixels enclose the first pixel in the virtual square.

5. (Original) The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

6. (Canceled)

7. (Previously presented) The pixel arrangement structure of claim 5, wherein
the first pixel has an octagonal shape, and
one of the second pixel and the third pixel has a hexagonal shape and another of the second pixel and the third pixel has a quadrilateral shape.

8. (Previously presented) The pixel arrangement structure of claim 7, wherein the first pixels have octagonal shapes that are symmetrical to each other.

9. (Original) The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. (Previously presented) The pixel arrangement structure of claim 9, wherein a shortest distance between the first pixel and the second pixels as well as a shortest distance between the first pixel and the third pixels is a same first length.

11. (Currently amended) The pixel arrangement structure of claim 10, wherein

~~a shortest distance between each of the second pixels and the third pixels is a same second length, and~~

a shortest distance between the first pixels is a third length that is longer than the first length and ~~the second length~~ a shortest distance between each of the second pixels and the third pixels.

12. (Original) The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. (Previously presented) The pixel arrangement structure of claim 1, wherein

the first pixel is configured to emit green light,

one of the second pixel and the third pixel is configured to emit blue light, and

another of the second pixel and the third pixel is configured to emit red light.

14. (Previously presented) The pixel arrangement structure of claim 5, wherein

the first pixel has an octagonal shape, and

at least one of the second pixel and the third pixel has a hexagonal shape.

15. (Canceled)

16. (Previously presented) The pixel arrangement structure of claim 1, wherein the first vertex and the centers of the first pixels are collinear, and

wherein the first pixels are separated from each other by only the second pixel.

17. (Previously presented) The pixel arrangement structure of claim 1, wherein the second pixel has a different polygonal shape from the third pixel.

REMARKS/ARGUMENTS

Claims 1–5, 7–14, and 16–17 are pending in the present application, of which claim 1 is independent. Claim 11 is allowable. Claim 11 is rewritten herein to conform to FIG. 6. The Applicant respectfully requests continued allowability of claim 11, and reconsideration and allowance of claims 1–5, 7–10, 12–14, and 16–17.

Examiner interview of June 6, 2016

The Applicant thanks Examiner Yang for his time, courtesy, and guidance during the June 6, 2016 interview with the Applicant's attorney. In the interview, the Applicant's previous response filed May 26, 2016 was discussed. The Examiner said that claim 1 still read on Satou for the reasons now presented in the Office action.

Rejection of claims 1–4, 12–13, and 16 under 35 U.S.C. § 102(b) by Satou

According to page 3 of the Office action, "Claims 1–4, 12–13 and 16 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Satou (U.S. Pub. No. US 2010/0171440 A1)." The Applicant respectfully traverses as follows.

Independent claim 1 recites:

> 1. A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:
>
> a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:
>
> a first pixel having a center coinciding with a center of a virtual square;
>
> another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;
>
> a second pixel separated from the first pixels and having a center at the first vertex; and
>
> a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

wherein the first pixel, the second pixel, and the third pixel have polygonal shapes.

Satou does not disclose at least the claim 1 limitations, "a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display." Page 3 of the Office action asserts that Satou discloses these limitations of claim 1 in FIGs. 1–3 and 6 as well as ¶¶ [0253] & [0262]. Specifically, the Office action interprets the reciting of the term "image display" in Satou ¶¶ [0253] & [0262] as sufficient disclosure of these limitations.

The Applicant respectfully disagrees. Satou is directed to an illuminating device having a "composite light" as recited in the title, abstract, independent claims, and throughout the detailed description. The luminescence sources of Satou would not function as pixels, nor does Satou assert that they would. While Satou ¶¶ [0253] & [0262] mention "image display," they are silent regarding the pixels of such a display. Instead, as mentioned in Satou ¶ [0253], the illuminating device is suitable for use as a backlight (such as in a liquid crystal display), "The illuminating device according to the present invention can be clearly distinct from a conventional light-emitting device (backlight) as an image display, in which a technical significance of the present invention consists." Satou ¶ [0262] further discusses the use as a backlight, reciting, "An excessively low luminescent efficiency may lead to element destruction due to heat generation when luminescence sources are integrated as an image display."

For at least these reasons, Satou does not disclose at least the claim 1 limitations, "a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display." To establish a prima facie case of anticipation, the cited reference must disclose every limitation of the rejected claim. Since Satou does not disclose at least one limitation of claim 1, Satou does not anticipate claim 1. Furthermore, claims 2–4, 12-13, and 16 depend from claim 1, such that they incorporate all of the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish these

claims over the art of record. Accordingly, the Applicant respectfully requests that the § 102(b) rejection of claims 1–4, 12–13, and 16 be withdrawn and that these claims be allowed.

Rejection of claim 17 under 35 U.S.C. § 103(a) over Satou/Chao

Rejection of claim 5 under 35 U.S.C. § 103(a) over Satou/Koo

Rejection of claims 7–8 and 14 under 35 U.S.C. § 103(a) over Satou/Koo/Chao

Rejection of claims 9–10 under 35 U.S.C. § 103(a) over Satou/Koo/Chao/Louwsma

According to page 5 of the Office action, "Claim 17 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Chao (U.S. Pub. No. US 2008/0001525 A1)." According to page 6 of the Office action, "Claim[s] 5 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Koo (U.S. Pub. No. US 2008/0001527 A1)." According to page 7 of the Office action, "Claims 7, 8, and 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou, in view of Koo as applied to claim 5 above, and further in view of Chao." According to page 9 of the Office action, "Claims 9-10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Koo as applied to claim 7 above, in view of Chao as applied to claim 7, and further in view of Louwsma (U.S[.] Pub. No. US 2008/0308819 A1)." The Applicant respectfully traverses as follows.

Independent claim 1 is patently distinguishable over Satou for at least the reasons discussed above. Further, the addition of Chao, Koo, or Louwsma cannot cure the above-cited deficiencies of Satou to support a § 103(a) rejection of claim 1. As discussed above, Satou is directed to illuminating devices with composite light. While Satou mentions that such illuminating devices may be useful as a backlight in an image display, Satou is silent regarding using its luminescence sources as "a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display" as recited in claim 1. It would be a nonobvious modification to one of ordinary skill in the art at the time of the present

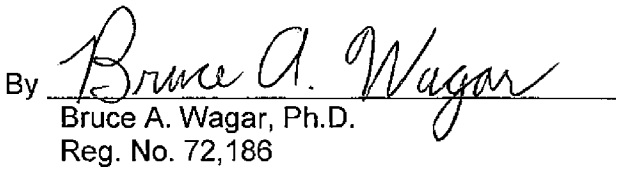
invention to modify the illuminating device of Satou (suitable for use as a backlight), and in particular the luminescence sources, to be "individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display" as recited in claim 1.

For at least these reasons, claim 1 is patentably distinguishable over Satou in view of Chao, Koo, or Louwsma. Furthermore, claims 5, 7–10, 14, and 17 depend from claim 1, such that they incorporate all of the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish these claims over the art of record. Accordingly, the Applicant respectfully requests that the § 103(a) rejections of claims 5, 7–10, 14, and 17 be withdrawn and that these claims be allowed.

Concluding remarks

In view of the foregoing amendments and remarks, the Applicant earnestly solicits a timely issuance of a Notice of Allowance for claims 1–5, 7–14, and 16–17. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call the Applicant's attorney at the number listed below.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By 
Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/dst

MAC PAS1429087.4-*-08/12/16 4:41 PM

Electronic Acknowledgement Receipt

EFS ID:	26634083
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Bruce A. Wagar/Marti Carrillo
Filer Authorized By:	Bruce A. Wagar
Attorney Docket Number:	72827/S1437
Receipt Date:	12-AUG-2016
Filing Date:	26-APR-2013
Time Stamp:	21:16:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_AAF.PDF	259303 2d04030ce6a0a52479013a18ea3aa52294aa7537	yes	10

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Response After Final Action	3	3
	Claims	4	6
	Applicant Arguments/Remarks Made in an Amendment	7	10
Warnings:			
Information:			
	Total Files Size (in bytes):	259303	

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
AMENDMENT TRANSMITTAL LETTER

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on August 12, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Marti Carrillo

Inventor : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Kwang-Su Yang

Docket No. : 072827

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
August 12, 2016

Commissioner:

Enclosed is an amendment to the above-identified application.

CLAIMS AS AMENDED							
	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra Claims	Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Total Claims	15 -	* 20	= 0	0 x $80.00	$40.00	$20.00	$0.00
Independent Claims	1 -	** 3	= 0	0 x $420.00	$210.00	$105.00	$0.00
Multiple Dependent Claims***				$780.00	$390.00	$195.00	$0.00
						Total Additional Fee	$0.00
List Independent Claims: 1							
* If the "Highest Number of Total Claims Previously Paid For" is less than 20, enter "20" in this space ** If the "Highest Number of Independent Claims Previously Paid For" is less than 3, enter "3" in this space *** Pay this fee only when "Multiple Dependent Claims" are added for the first time							

__X__ No additional fee is required.

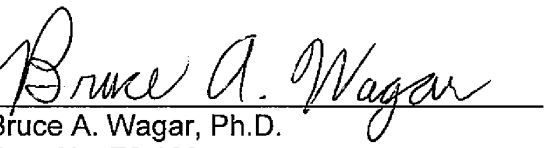
_____ A Petition for Extension of Time and the required fee are enclosed.

_____ Other enclosures: _____

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by or to give effect to this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By 

Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/dst

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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/872,018	Filing Date 04/26/2013	☒ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	08/12/2016	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						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 number found in the appropriate box in column 1.

SLIE
/NICHELE PETERSON/

This collection of information is required by 37 CFR 1.16. 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, 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.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	072827
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2011/0291550 A1	12-01-2011	Kim et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		KR 10-2011-0129531	12-02-2011	Kim et al.	Corresponds to U.S. Publication 2011/0291550 listed above

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		KIPO Office action dated July 11, 2016, with English translation, for corresponding Korean Patent application 10-2016-0047800, (11 pages)

DLG PAS1430726.1-*-07/21/16 9:37 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/dg

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Young E. Jeon/Diane Goss
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	26420559
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Diane Goss
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	21-JUL-2016
Filing Date:	26-APR-2013
Time Stamp:	16:42:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	5952
Deposit Account	
Authorized User	
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		72827ids.pdf	116170 70f8396ee05763c2e4ac25fa01717c05bdfae2c6	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Foreign Reference	KR1020110129531.pdf	1140434 0e4c84294fd2edc8578e4917aa3f5dfec39311c2	no	13
Warnings:					
Information:					
3		KR_OfficAction-EnglishTrans.pdf	1715875 f306ba81c0f7bcbb78d6a3c39793b54ed1e6cbf4	yes	11
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Non Patent Literature		1	5	
	Other Reference-Patent/App/Search documents		6	11	
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30630 3da90e33dcd3b4de02aad4199cffb65ac23a0a67	no	2
Warnings:					

Information:	
Total Files Size (in bytes):	3003109

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on July 21, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 072827	

INFORMATION DISCLOSURE STATEMENT WITH FEE UNDER 37 CFR §§ 1.97(d) AND 1.17(p)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
July 21, 2016

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. Copies of each of the listed Foreign Patent Documents and Other Documents references are enclosed.

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No. 13/872,018

Applicant's undersigned attorney hereby certifies, in accordance with 37 CFR § 1.97(e)(1), that each item of information contained in the information disclosure statement was first cited in a communication from any foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

The processing fee of $180.00 as required by 37 CFR § 1.17(p) is submitted herewith. The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/dg
Enclosures: Information Disclosure Statement, w/references

DLG PAS1430829.1-*-07/21/16 9:40 AM

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 06/23/2016
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
06/23/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@lrrc.com
pair_cph@firsttofile.com

Office Action Summary	Application No. 13/872,018	Applicant(s) LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05/26/2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-5,7-14,16 and 17* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,7-10,12-14,16 and 17* is/are rejected.

8)☒ Claim(s) *11* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *09/29/2015* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Response to Amendment

2. The amendment filed on 05/26/2016 has been entered and considered by examiner.

Drawings

3. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the shortest distance L2 is **not** of **a same length** in **Fig. 6** and a limitation "a shortest distance between each of the second pixels and the third pixels is **a same second length**" in **claim 11** implies that L2's in Fig. 6 should be same. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 12-13 and 16 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Satou (U.S. Pub. No. US 2010/0171440 A1).

As to claim 1, Satou (Figs. 1-3 and 6) teaches **a pixel arrangement structure** (a honeycomb structure, which Is a repeating pattern; Fig. 6(a)) **of an organic light emitting diode (OLED) display** (OLEDs; [0002], lines 5-6; an image display; [0253], lines 7-9)**, comprising:**

- **a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display** (three color luminescence sources (red, green, blue); [0250], lines 2-3; Figs. 3 and 6(a); OLEDs (Organic Light Emitting Diode); [0002], lines 5-6; luminance sources are integrated as an image display; [0262], lines 7-10) **and comprising:**
  - **a first pixel** (G in a point (2, 2) where an origin (0, 0) is a top, left point, increasing in the right direction and downward in coordinate) **having a center coinciding with a center of a virtual square** (a virtual square consists of points (1, 1), (3, 1), (1, 3) and (3, 3); Fig. 6(a))**;**
  - **another first pixel** (G in a point (4, 2)) **having a center coinciding with a center of another virtual square** (another virtual square consists of points (3, 1), (5, 1), (3, 3) and (5, 3); Fig. 6(a))**, the virtual squares sharing a common side** (a common side from the point (3, 1) to the point (3, 3)) **having endpoints at a common first vertex** (the point (3, 1)) **and a common second vertex** (the point (3, 3) **of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light** (red color and blue color; Fig. 6(a))**;**
  - **a second pixel** (R in the point (3, 1)) **separated from the first pixels**

(G's in the points (2, 2) and (4, 2)) **and having a center at the first vertex** (the point (3, 1))**; and**

- **a third pixel** (B in the point (3, 3)) **separated from the first pixels** (G's in the points (2, 2) and (4, 2)) **and the second pixel** (R in the point (3, 1))**, and having a center at the second vertex** (the point (3, 3)) (Fig. 6(a))~~,~~

- **wherein the first pixel, the second pixel, and the third pixel have polygonal shapes** (octagon shapes; Fig. 6(a))**.**

As to claim 2, Satou teaches

- **wherein the second pixel comprises a pair of second pixels** (R's in the points (3, 1) and (1, 3))**, and the second pixels are separated from each other by the first pixel** (G in the point (2, 2)) (Fig. 6(a))**.**

As to claim 3, Satou teaches

- **wherein the third pixel comprises a pair of third pixels** (B's in the point (1, 1) and (3, 3))**, and the third pixels are separated from each other by the first pixel** (G in the point (2, 2)) (Fig. 6(a))**.**

As to claim 4, Satou teaches

- **wherein the second pixel comprises a pair of second pixels** (R's in the points (3, 1) and (1, 3))**, the third pixel comprises a pair of third pixels** (B's in the point (1, 1) and (3, 3)) (Fig. 6(a))**, and the second pixels and the third pixels enclose the first pixel in the virtual square** (Fig. 6(a))**.**

As to claim 12, Satou teaches

- **wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light** (green, red, and blue colors; Fig. 6(a))**.**

As to claim 13, Satou teaches

- **wherein the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and another of the second pixel or the third pixel is configured to emit red light** (G in the point (2, 2), R in the point (3, 1), and B in the point (3, 3); Fig. 6(a))**.**

As to claim 16, Satou teaches

- **wherein the first vertex** (the point (3, 1)) **and the centers** (e.g., points (2, 2), (4, 2), (2, 0), (4, 0)) **of the first pixels (**G's) **are collinear** (Fig. 6(a))**, and**
- **wherein the first subpixels** (G's) **are separated from each other by only the second pixel** (R) (Fig. 6(a))**.**

Claim Rejections - 35 USC § 103

6. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 17 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Chao (U.S Pub. No. US 2008/0001525 A1).

As to claim 17, Satou teaches **the pixel arrangement structure of claim 1.**

Satou does not teach **wherein the second pixel has a different polygon shape from the third pixel.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches

- **wherein the second pixel has a different polygon shape from the third pixel** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a pixel arrangement of Satou because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

8. Claims 5 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Koo (U.S Pub. No. US 2008/0001527 A1).

As to claim 5, Satou teaches **the pixel arrangement structure of claim 4.**

Satou does not teach **wherein each of the second pixels and the third pixels is larger in area than the first pixel.**

Koo (Fig. 1) teaches

- **wherein each of the second pixels and the third pixels is larger in area than the first pixel** (the light emitting areas of the R unit pixel or the B unit pixel are larger than the light emitting areas of the G unit pixel; [0013], lines 8-13)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different sizes of light emitting areas as taught by Koo in a pixel arrangement of Satou because different sizes of light emitting areas can generate the same luminance from the R, G and B unit pixels.

9. Claims 7, 8, and 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou, in view of Koo as applied to claim 5 above, and further in view of Chao.

As to claim 7, Satou and Koo teach **the pixel arrangement structure of claim 5.**

Satou also teaches **wherein**

- **the first pixel has an octagonal shape** (G in a point (2, 2) is an octagon; Fig. 6(a))**.**

Satou and Koo do not teach **wherein one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape** (each of the red, green, and blue light emission **zones** 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission

zones as taught by Chao in a pixel arrangement of Satou as modified by Koo because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 8, Satou teaches **wherein**

- **the first pixels have octagonal shapes that are symmetrical to each other** (G's have octagonal shapes that are symmetrical to each other; Fig. 6(a))**.**

As to claim 14, Satou and Koo teach **the pixel arrangement structure of claim 5.**

Satou also teaches **wherein**

- **the first pixel has an octagonal shape** (G in a point (2, 2) is an octagon; Fig. 6(a))**.**

Satou and Koo do not teach **wherein at least one of the second pixel and the third pixel has a hexagonal shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **at least one of the second pixel and the third pixel has a hexagonal shape** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle, circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a pixel arrangement of Satou as modified by Koo because

the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

10. Claims 9-10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Koo as applied to claim 7 above, in view of Chao as applied to claim 7, and further in view of Louwsma (U.S Pub. No. US 2008/0308819 A1).

As to claim 9, Satou, Koo and Chao teach **the pixel arrangement structure of claim 7.**

Satou, Koo and Chao do not teach **wherein each of the second pixels is larger in area than each of the third pixels.**

Louwsma (Figs. 1, 2 and 5) teaches

- **wherein each of the second pixels is larger in area than each of the third pixels** (if a red color radiation emitted by the red color layer R has a relatively low intensity in comparison to the blue color, the area of the red color LED element R can be chosen larger than the area size of the blue LED element; [0051], lines 7-16)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different area sizes as taught by Louwsma in a pixel arrangement of Satou as modified by Koo and Chao and because the pixel size of the blue component relative to the red or green may be larger to cause the pixel elements to age at a common rate.

As to claim 10, Satou teaches

- **wherein a shortest distance between the first pixel and the second pixels as well as a shortest distance between the first pixel and the third pixels is a same first length** (Fig. (6a))**.**

Allowable Subject Matter

11. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

12 Applicant's arguments filed on 05/26/2016 have been fully considered but they are not persuasive.

As to claim 1, the amended limitation "a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display" still reads on Satou ("individually addressable pixels"; Figs. 3 and 6(a); and "the OLED display" (OLEDs (Organic Light Emitting Diode) ([0002], lines 5-6) and luminance sources are integrated as an image display ([0262], lines 7-10))).

Therefore, the Office maintains the rejections as recited above.

Conclusion

13. **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiry

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang-Su Yang whose telephone number is 571-270-7307. The examiner can normally be reached on Mon-Fri during 9:00am-6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. 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).

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		8,026,669 B2	09-27-2011	Kawasaki et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2004-507773	03-11-2004	Brown Elliott	Corresponds to U.S. Publication 2002/0015110 previously filed in an IDS dated August 30, 2013
		WO 2004/073356 A1	08-26-2004	Sakamoto	Corresponds to U.S. Publication 2005/0162079 previously filed in an IDS dated May 21, 2015

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		JPO Office action dated February 16, 2016, corresponding to Japanese Patent application 2012-108855, (5 pages)

DLG PAS1409884.1-*-03/21/16 8:26 AM

EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	06/17/2016

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

RMS/dg

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	72827/411598
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwano-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2006/0152531 A1	07-13-2006	Lin et al.
		2010/0133994 A1	06-03-2010	Song et al.
		2012/0287605 A1	11-15-2012	Chen et al.
		2013/0127689 A1	05-23-2013	Gollier

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office action dated April 7, 2016, for U.S. parent Patent application 13/614,197, (13 pages)

DLG PAS1414814.1-*-04/18/16 12:24 PM

EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	06/17/2016

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

PCH/dg

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

✓	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	06/24/2015	10/12/2015	02/23/2016	06/17/2016					
	1	✓	✓	✓	✓					
	2	✓	✓	✓	✓					
	3	✓	✓	✓	✓					
	4	✓	✓	✓	✓					
	5	✓	✓	✓	✓					
	6	N	-	-	-					
	7	✓	✓	✓	✓					
	8	✓	✓	✓	✓					
	9	✓	✓	✓	✓					
	10	✓	✓	✓	✓					
	11	O	O	✓	O					
	12	✓	✓	✓	✓					
	13	✓	✓	✓	✓					
	14	✓	✓	✓	✓					
	15		✓	-	-					
	16		✓	✓	✓					
	17		✓	✓	✓					

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

CPC- SEARCHED		
Symbol	Date	Examiner
G09G3/3208 H01L27/3216 H01L27/3218	06/23/2015	KY

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST: Inventor Search and Assignee Search	06/23/2015	KY
EAST: Text Search	06/23/2015; 06/24/2015	KY
EAST: IDS Search	10/12/2015	KY
EAST: Updated Text Search	02/22/2016; 02/23/2016	KY
EAST: IDS Search	06/17/2016	KY

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/KWANG-SU YANG/ Primary Examiner.Art Unit 2691

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	10	("20060152531" "20100133994" "20120287605" "20130127689").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/06/17 15:25

EAST Search History (Interference)

< This search history is empty>

6/ 17/ 2016 4:32:22 PM
C:\ Users\ kyang\ Documents\ EAST\ Workspaces\ 13872018.wsp

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 06/13/2016
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
06/13/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@lrrc.com
pair_cph@firsttofile.com

Applicant-Initiated Interview Summary	**Application No.**	**Applicant(s)**	
	13/872,018	LEE, SANG-SHIN	
	Examiner	**Art Unit**	
	KWANG-SU YANG	2691	

All participants (applicant, applicant's representative, PTO personnel):

(1) *KWANG-SU YANG*. (3)_____.

(2) *BRUCE WAGER (Reg. No. 72,186)*. (4)_____.

Date of Interview: *06 June 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☒102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: *Satou (U.S. Pub. No. US 2010/0171440 A1)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

discusses an amendment in RCE filed on 05/26/2016. The Examiner explains that the amended limitations in claim 1 still read on Satou, e.g., "individually addressable pixels" (Figs. 3 and 6(a)) and "the OLED dislay" (OLEDs (Organic LIght Emitting Diode); [0002], lines 5-6; luminance sources are integrated as an image display; [0262], lines 7-10). An agreement has been reached.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on May 26, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Debra Thomas

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827	
Customer No.	: 23363	

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
May 26, 2016

Commissioner:

In response to the non-final Office action of February 29, 2016 (hereinafter "the Office action"), please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:

a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units ~~for displaying an image~~ of the OLED display and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

wherein the first pixel, the second pixel, and the third pixel have polygonal shapes.

2. (Original) The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels, and

the second pixels are separated from each other by the first pixel.

3. (Original) The pixel arrangement structure of claim 1, wherein
the third pixel comprises a pair of third pixels, and
the third pixels are separated from each other by the first pixel.

4. (Original) The pixel arrangement structure of claim 1, wherein
the second pixel comprises a pair of second pixels,
the third pixel comprises a pair of third pixels, and
the second pixels and the third pixels enclose the first pixel in the virtual square.

5. (Original) The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

6. (Canceled)

7. (Previously presented) The pixel arrangement structure of claim 5, wherein
the first pixel has an octagonal shape, and
one of the second pixel and the third pixel has a hexagonal shape and another of the second pixel and the third pixel has a quadrilateral shape.

8. (Previously presented) The pixel arrangement structure of claim 7, wherein the first pixels have octagonal shapes that are symmetrical to each other.

9. (Original) The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. (Currently amended) The pixel arrangement structure of claim 9, wherein a shortest distance between the first pixel and the second pixels as well as a shortest distance between the first pixel and the third pixels is a same first length.

11. (Currently amended) The pixel arrangement structure of claim 10, wherein

a shortest distance between each of the second pixels and the third pixels is a same second length, and

a shortest distance between the first pixels is a third length that is longer than the first length and the second length.

12. (Original) The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. (Previously presented) The pixel arrangement structure of claim 1, wherein

the first pixel is configured to emit green light,

one of the second pixel and the third pixel is configured to emit blue light, and

another of the second pixel and the third pixel is configured to emit red light.

14. (Previously presented) The pixel arrangement structure of claim 5, wherein

the first pixel has an octagonal shape, and

at least one of the second pixel and the third pixel has a hexagonal shape.

15. (Canceled)

16. (Previously presented) The pixel arrangement structure of claim 1,

wherein the first vertex and the centers of the first pixels are collinear, and

wherein the first pixels are separated from each other by only the second pixel.

17. (Previously presented) The pixel arrangement structure of claim 1, wherein the second pixel has a different polygonal shape from the third pixel.

REMARKS/ARGUMENTS

Claims 1–5, 7–14, and 16–17 are pending in the present application, of which claim 1 is independent. Claims 1 and 10–11 are amended herein and find support in at least ¶ [0033] of the application as filed. The Applicant respectfully requests reconsideration and allowance of claims 1–5, 7–14, and 16–17.

Rejection of claim 11 under 35 U.S.C. § 112 ¶ 2

According to page 2 of the Office action, "Claim 11 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention." The Applicant has amended claim 11 and respectfully submits that claim 11 particularly points out and distinctly claims subject matter that the Applicant regards as an embodiment of the present invention. Accordingly, the Applicant requests that the § 112 ¶ 2 rejection of claim 11 be withdrawn and that this claim be allowed.

Rejection of claims 1–4, 12–13, and 16 under 35 U.S.C. § 102(b) by Satou

According to page 3 of the Office action, "Claims 1–4, 12–13 and 16 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Satou (U.S. Pub. No. US 2010/0171440 A1)." The Applicant amends claim 1, and respectfully argues as follows.

Independent claim 1 now recites:

> 1. A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:
>
> a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display and comprising:
>
> a first pixel having a center coinciding with a center of a virtual square;
>
> another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in

each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first pixels and having a center at the first vertex; and

a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,

wherein the first pixel, the second pixel, and the third pixel have polygonal shapes. (Emphasis added.)

Satoh does not disclose at least the claim 1 limitation, "a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display." Satoh is directed to illuminating devices and not to display devices. The illumination sources in Satoh (which the Office action equates to "pixels" of claim 1) are not "individually addressable," not capable of "displaying images," and not "minimum addressable units of the OLED display" as now recited in claim 1. For at least these reasons, Satoh does not disclose the claim 1 limitation, "a plurality of individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display."

To establish a prima facie case of anticipation, the cited reference must disclose every limitation of the rejected claim. Since Satoh does not disclose at least one limitation of claim 1, Satoh does not anticipate claim 1. Furthermore, claims 2–4, 12-13, and 16 depend from claim 1, such that they incorporate all of the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish these claims over the art of record. Accordingly, the Applicant respectfully requests that the § 102(b) rejection of claims 1–4, 12–13, and 16 be withdrawn and that these claims be allowed.

Rejection of claim 17 under 35 U.S.C. § 103(a) over Satou/Chao

Rejection of claim 5 under 35 U.S.C. § 103(a) over Satou/Koo

Rejection of claims 7–8 and 14 under 35 U.S.C. § 103(a) over Satou/Koo/Chao

Rejection of claims 9–10 under 35 U.S.C. § 103(a) over Satou/Koo/Chao/Louwsma

According to page 6 of the Office action, "Claim 17 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Chao (U.S. Pub. No. US 2008/0001525 A1)." According to page 7 of the Office action, "Claim[] 5 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Koo (U.S. Pub. No. US 2008/0001527 A1) . . . Claims 7, 8, and 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou, in view of Koo as applied to claim 5 above, and further in view of Chao." According to page 9 of the Office action, "Claims 9-10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Koo as applied to claim 7 above, in view of Chao as applied to claim 7, and further in view of Louwsma (U.S[.] Pub. No. US 2008/0308819 A1)." The Applicant respectfully argues as follows.

Independent claim 1 is patently distinguishable over Satou for at least the reasons discussed above. Further, the addition of Chao, Koo, or Louwsma cannot cure the above-cited deficiencies of Satou to support a § 103(a) rejection of claim 1. As discussed above, Satou is directed to illuminating devices and not to display devices. Satou is silent regarding using its illuminating device (for illuminating other objects) as a display device (for displaying images). It would be a nonobvious modification to one of ordinary skill in the art at the time of the present invention to modify the illuminating device of Satou to have "individually addressable pixels for displaying images, the individually addressable pixels being minimum addressable units of the OLED display" as now recited in claim 1.

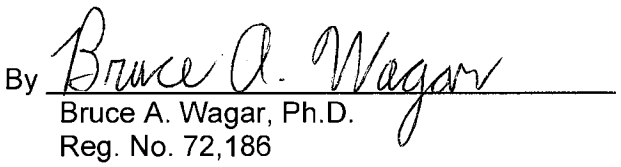
For at least these reasons, claim 1 is patentably distinguishable over Satou in view of Chao, Koo, or Louwsma. Furthermore, claims 5, 7–10, 14, and 17 depend from claim 1, such that they incorporate all of the terms and limitations of claim 1 in addition

to other limitations, which together further patentably distinguish these claims over the art of record. Accordingly, the Applicant respectfully requests that the § 103(a) rejections of claims 5, 7–10, 14, and 17 be withdrawn and that these claims be allowed.

Concluding remarks

In view of the foregoing amendments and remarks, the Applicant respectfully requests a Notice of Allowance for claims 1–5, 7–14, and 16–17. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call the Applicant's attorney at the number listed below.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By 
Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/dst

DST PAS1411756.3-*-05/26/16 4:19 PM

Electronic Acknowledgement Receipt

EFS ID:	25902615
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Bruce A. Wagar/Debra Thomas
Filer Authorized By:	Bruce A. Wagar
Attorney Docket Number:	72827/S1437
Receipt Date:	26-MAY-2016
Filing Date:	26-APR-2013
Time Stamp:	20:16:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	72827_Transmittal.pdf	60911 50dababa51543aaea6f86b3ead48178f1007ef0e	no	2

Warnings:	
Information:	

2		72827_Amendment.pdf	302187 0ae7dbb08f42ef160d04b510c626a6caacad3015	yes	8

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	8

Warnings:	
Information:	
Total Files Size (in bytes):	363098

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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New International Application Filed with the USPTO as a Receiving Office
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
AMENDMENT TRANSMITTAL LETTER

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on May 26, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Debra Thomas

Inventor : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Kwang-Su Yang

Docket No. : 72827

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
May 26, 2016

Commissioner:

Enclosed is an amendment to the above-identified application.

CLAIMS AS AMENDED							
	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra Claims	Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Total Claims	15 -	* 20	= 0	0 x $80.00	$40.00	$20.00	$0.00
Independent Claims	1 -	** 3	= 0	0 x $420.00	$210.00	$105.00	$0.00
Multiple Dependent Claims***				$780.00	$390.00	$195.00	$0.00
						Total Additional Fee	$0.00
List Independent Claims: 1							
* If the "Highest Number of Total Claims Previously Paid For" is less than 20, enter "20" in this space ** If the "Highest Number of Independent Claims Previously Paid For" is less than 3, enter "3" in this space *** Pay this fee only when "Multiple Dependent Claims" are added for the first time							

__X__ No additional fee is required.

_____ A Petition for Extension of Time and the required fee are enclosed.

_____ Other enclosures: _____

Amendment Transmittal Letter
Application No. 13/872,018

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by or to give effect to this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By Bruce A. Wagar
Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/dst

DST PAS1421766.1-*-05/26/16 4:32 PM

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/872,018	Filing Date 04/26/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 05/26/2016

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					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 number found in the appropriate box in column 1.

LIE
/DORRETTA BROOKS/

This collection of information is required by 37 CFR 1.16. 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, 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.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	72827/411598
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwano-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2006/0152531 A1	07-13-2006	Lin et al.
		2010/0133994 A1	06-03-2010	Song et al.
		2012/0287605 A1	11-15-2012	Chen et al.
		2013/0127689 A1	05-23-2013	Gollier

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office action dated April 7, 2016, for U.S. parent Patent application 13/614,197, (13 pages)

DLG PAS1414814.1-*-04/18/16 12:24 PM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

PCH/dg

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Peter C. Hsueh/Diane Goss
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	25536291
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Peter C. Hsueh/Diane Goss
Filer Authorized By:	Peter C. Hsueh
Attorney Docket Number:	72827/S1437
Receipt Date:	19-APR-2016
Filing Date:	26-APR-2013
Time Stamp:	16:56:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	4283
Deposit Account	
Authorized User	
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		72827ids.pdf	108058 4bd1c0872cb47b0267ce72c5fe91c2a444b39a1a	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Non Patent Literature	USOA4197-07APR2016.pdf	444678 2e57bdf9becaac6a20a7375ff25349f195bc7ffe	no	13
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30578 95740c400e17d2b5bfbc54fdb7839364ef680ddc	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	583314		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on April 19, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor(s)	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwano-Su Yang	
Docket No.	: 72827/411598	

INFORMATION DISCLOSURE STATEMENT WITH FEE UNDER 37 CFR §§ 1.97(c) AND 1.17(p)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
April 19, 2016

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. A copy of the listed Other Documents reference is enclosed.

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No. 13/872,018

The processing fee of $180.00 as required by 37 CFR § 1.17(p) is submitted herewith. The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Peter C. Hsueh
Reg. No. 45,574
626/795-9900

PCH/dg
Enclosures: Information Disclosure Statement, w/references

DLG PAS1414819.1-*-04/19/16 11:25 AM

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		8,026,669 B2	09-27-2011	Kawasaki et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2004-507773	03-11-2004	Brown Elliott	Corresponds to U.S. Publication 2002/0015110 previously filed in an IDS dated August 30, 2013
		WO 2004/073356 A1	08-26-2004	Sakamoto	Corresponds to U.S. Publication 2005/0162079 previously filed in an IDS dated May 21, 2015

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		JPO Office action dated February 16, 2016, corresponding to Japanese Patent application 2012-108855, (5 pages)

DLG PAS1409884.1-*-03/21/16 8:26 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

RMS/dg

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Ryan Matthew Swank/Diane Goss
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	25271524
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Ryan Matthew Swank/Diane Goss
Filer Authorized By:	Ryan Matthew Swank
Attorney Docket Number:	72827/S1437
Receipt Date:	22-MAR-2016
Filing Date:	26-APR-2013
Time Stamp:	15:56:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	2546
Deposit Account	
Authorized User	
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		72827ids.pdf	111189 268991341bd1f034bb00ca05c6f6d4b5a395be85	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Foreign Reference	JP2004507773.pdf	4539661 ff9e4800310b09f0ee07ad91b806d1e2be98b826	no	98
Warnings:					
Information:					
3	Foreign Reference	WO2004073356.pdf	2177290 e9d6fcdf506b3ef18bcce8110baade051c9ad064	no	27
Warnings:					
Information:					
4	Non Patent Literature	JP_OfficeAction.pdf	106607 2c8cee4d74e9d62e2d155e02c2f6d16dc97ff8d6	no	5
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	30706 7cb0169fb93867be1221481d8bb4a2babd48e65a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	6965453		

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.

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New International Application Filed with the USPTO as a Receiving Office
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on March 22, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT WITH FEE UNDER 37 CFR §§ 1.97(c) AND 1.17(p)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
March 22, 2016

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing the references that are known to applicant. Copies of each of the listed Foreign Patent Documents and Other Documents references are enclosed.

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No. 13/872,018

The processing fee of $180.00 as required by 37 CFR § 1.17(p) is submitted herewith. The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Ryan M. Swank
Reg. No. 62,600
626/795-9900

RMS/dg
Enclosures: Information Disclosure Statement, w/references

DLG PAS1410333.1-*-03/21/16 8:39 AM

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 02/29/2016
Lewis Roca Rothgerber Christie LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
02/29/2016	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pair_cph@firsttofile.com
pto@lrrc.com

Office Action Summary	Application No. 13/872,018	Applicant(s) LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01/19/2016*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-5,7-14,16 and 17* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5, 7-14, 16 and 17* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/19/2016 has been entered.

Claim Rejections - 35 USC § 112

3. The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 11 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

- In claim 11, a reference point for the distance between two pixels is not clearly specified, e.g., a center of each pixel or the shortest distance between two pixels. Therefore, claim 11 is indefinite.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4, 12-13 and 16 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Satou (U.S. Pub. No. US 2010/0171440 A1).

As to claim 1, Satou (Figs. 1-3 and 6) teaches **a pixel arrangement structure** (a honeycomb structure, which Is a repeating pattern; Fig. 6(a)) **of an organic light emitting diode (OLED) display** (OLEDs; [0002], lines 5-6; an image display; [0253], lines 7-9)**, comprising:**

- **a plurality of pixels, the pixels being minimum units for displaying an image** (e.g., three color luminescence sources (red, green, blue); [0250], lines 2-3) **and comprising:**

  - **a first pixel** (G in a point (2, 2) where an origin (0, 0) is a top, left point, increasing in the right direction and downward in coordinate) **having a center coinciding with a center of a virtual square** (a virtual square consists of points (1, 1), (3, 1), (1, 3) and (3, 3); Fig. 6(a))**;**

- **another first pixel** (G in a point (4, 2)) **having a center coinciding with a center of another virtual square** (another virtual square consists of points (3, 1), (5, 1), (3, 3) and (5, 3); Fig. 6(a))**, the virtual squares sharing a common side** (a common side from the point (3, 1) to the point (3, 3)) **having endpoints at a common first vertex** (the point (3, 1)) **and a common second vertex** (the point (3, 3) **of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light** (red color and blue color; Fig. 6(a))**;**
- **a second pixel** (R in the point (3, 1)) **separated from the first pixels** (G's in the points (2, 2) and (4, 2)) **and having a center at the first vertex** (the point (3, 1))**; and**
- **a third pixel** (B in the point (3, 3)) **separated from the first pixels** (G's in the points (2, 2) and (4, 2)) **and the second pixel** (R in the point (3, 1))**, and having a center at the second vertex** (the point (3, 3)) (Fig. 6(a))**,**

- **wherein the first pixel, the second pixel, and the third pixel have polygonal shapes** (octagon shapes; Fig. 6(a))**.**

As to claim 2, Satou teaches

- **wherein the second pixel comprises a pair of second pixels** (R's in the points (3, 1) and (1, 3))**, and the second pixels are separated from each other by the first pixel** (G in the point (2, 2)) (Fig. 6(a))**.**

As to claim 3, Satou teaches

- **wherein the third pixel comprises a pair of third pixels** (B's in the point (1, 1)

and (3, 3))**, and the third pixels are separated from each other by the first pixel** (G in the point (2, 2)) (Fig. 6(a))**.**

As to claim 4, Satou teaches

- **wherein the second pixel comprises a pair of second pixels** (R's in the points (3, 1) and (1, 3))**, the third pixel comprises a pair of third pixels** (B's in the point (1, 1) and (3, 3)) (Fig. 6(a))**, and the second pixels and the third pixels enclose the first pixel in the virtual square** (Fig. 6(a))**.**

As to claim 12, Satou teaches

- **wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light** (green, red, and blue colors; Fig. 6(a))**.**

As to claim 13, Satou teaches

- **wherein the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and another of the second pixel or the third pixel is configured to emit red light** (G in the point (2, 2), R in the point (3, 1), and B in the point (3, 3); Fig. 6(a))**.**

As to claim 16, Satou teaches

- **wherein the first vertex** (the point (3, 1)) **and the centers** (e.g., points (2, 2), (4, 2), (2, 0), (4, 0)) **of the first pixels (**G's) **are collinear** (Fig. 6(a))**, and**
- **wherein the first subpixels** (G's) **are separated from each other by only the**

second pixel (R) (Fig. 6(a))**.**

Claim Rejections - 35 USC § 103

7. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 17 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Chao (U.S Pub. No. US 2008/0001525 A1).

As to claim 17, Satou teaches **the pixel arrangement structure of claim 1.**

Satou does not teach **wherein the second pixel has a different polygon shape from the third pixel.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches

- **wherein the second pixel has a different polygon shape from the third pixel** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a pixel arrangement of Satou because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

9. Claims 5 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Koo (U.S Pub. No. US 2008/0001527 A1).

As to claim 5, Satou teaches **the pixel arrangement structure of claim 4.**

Satou does not teach **wherein each of the second pixels and the third pixels is larger in area than the first pixel.**

Koo (Fig. 1) teaches

- **wherein each of the second pixels and the third pixels is larger in area than the first pixel** (the light emitting areas of the R unit pixel or the B unit pixel are larger than the light emitting areas of the G unit pixel; [0013], lines 8-13)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different sizes of light emitting areas as taught by Koo in a pixel arrangement of Satou because different sizes of light emitting areas can generate the same luminance from the R, G and B unit pixels.

10. Claims 7, 8, and 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou, in view of Koo as applied to claim 5 above, and further in view of Chao.

As to claim 7, Satou and Koo teach **the pixel arrangement structure of claim 5.**

Satou also teaches **wherein**

- **the first pixel has an octagonal shape** (G in a point (2, 2) is an octagon; Fig. 6(a))**.**

Satou and Koo do not teach **wherein one of the second pixel or the third pixel**

has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape.

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape** (each of the red, green, and blue light emission **zones** 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a pixel arrangement of Satou as modified by Koo because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 8, Satou teaches **wherein**

- **the first pixels have octagonal shapes that are symmetrical to each other** (G's have octagonal shapes that are symmetrical to each other; Fig. 6(a))**.**

As to claim 14, Satou and Koo teach **the pixel arrangement structure of claim 5.**

Satou also teaches **wherein**

- **the first pixel has an octagonal shape** (G in a point (2, 2) is an octagon; Fig. 6(a))**.**

Satou and Koo do not teach **wherein at least one of the second pixel and the third pixel has a hexagonal shape.**

Chao (Figs. 1b, 1c, 5a, 5b and 5d) teaches **wherein**

- **at least one of the second pixel and the third pixel has a hexagonal shape** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle, circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in a pixel arrangement of Satou as modified by Koo because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

11. Claims 9-10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Satou in view of Koo as applied to claim 7 above, in view of Chao as applied to claim 7, and further in view of Louwsma (U.S Pub. No. US 2008/0308819 A1).

As to claim 9, Satou, Koo and Chao teach **the pixel arrangement structure of claim 7.**

Satou, Koo and Chao do not teach **wherein each of the second pixels is larger in area than each of the third pixels.**

Louwsma (Figs. 1, 2 and 5) teaches

- **wherein each of the second pixels is larger in area than each of the third pixels** (if a red color radiation emitted by the red color layer R has a relatively low

intensity in comparison to the blue color, the area of the red color LED element R can be chosen larger than the area size of the blue LED element; [0051], lines 7-16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used different area sizes as taught by Louwsma in a pixel arrangement of Satou as modified by Koo and Chao and because the pixel size of the blue component relative to the red or green may be larger to cause the pixel elements to age at a common rate.

As to claim 10, Satou teaches

- **wherein a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length** (Fig. (6a)).

Response to Arguments

12. Applicant's arguments with respect to claims 1-5, 7-10, 12-14 and 16-17 have been considered but are moot in view of the new grounds of rejection.

In view of amendment, the references of Satou, Chao, Koo, and Louwsma have been used for the new grounds of rejection.

Therefore, the Office maintains the rejections as recited above.

Conclusion

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

- Osada (U.S. Pub. No. US 2002/0113195 A1) is cited to teach an image signal processing method with the result from decision on a correlation corrected.
- Oishi (U.S. Pub. No. US 2008/0273793 A1) is cited to teach a signal processing apparatus and method, noise reduction apparatus and method, and program therefor, in which a honeycomb arrangement is disclosed (Fig. 2).

Inquiry

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang-Su Yang whose telephone number is 571-270-7307. The examiner can normally be reached on Mon-Fri during 9:00am-6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. 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).

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

Notice of References Cited	Application/Control No. 13/872,018	Applicant(s)/Patent Under Reexamination LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	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-2010/0171440 A1	07-2010	Satou; Yoshihito	C09K11/0883	315/294
*	B	US-2008/0001527 A1	01-2008	Koo; Jae-Bon	H01L27/12	313/500
*	C	US-2008/0308819 A1	12-2008	Louwsma; Hendrik	H01L27/322	257/89
*	D	US-2002/0113195 A1	08-2002	Osada, Masaru	G06T3/4007	250/208.1
*	E	US-2008/0273793 A1	11-2008	Oishi; Makoto	H04N5/217	382/167
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office action dated December 2, 2015, for cross reference U.S. Patent application 13/614,197, (12 pages)

DLG PAS1394665.1-*-12/16/15 1:36 PM

EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	02/22/2016

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/dg

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/ Sheet 1 of 1

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

✓	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	06/24/2015	10/12/2015	02/23/2016						
	1	✓	✓	✓						
	2	✓	✓	✓						
	3	✓	✓	✓						
	4	✓	✓	✓						
	5	✓	✓	✓						
	6	N	-	-						
	7	✓	✓	✓						
	8	✓	✓	✓						
	9	✓	✓	✓						
	10	✓	✓	✓						
	11	O	O	✓						
	12	✓	✓	✓						
	13	✓	✓	✓						
	14	✓	✓	✓						
	15		✓	-						
	16		✓	✓						
	17		✓	✓						

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S27	2	"6882364".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/02/22 16:51
S28	90	("6882364").URPN.	USPAT	OR	ON	2016/02/22 16:52
S29	0	S28 and (organic adj light OLED)	USPAT	OR	ON	2016/02/22 16:53
S30	467	(organic adj light OLED) and honeycomb	USPAT	OR	ON	2016/02/22 16:55
S31	201	(organic adj light OLED) and honeycomb and square and red and green and blue	USPAT	OR	ON	2016/02/22 16:55
S32	13	("20040247009" | "20050127831" | "20060024011" | "20060146562" | "6555253" | "6630684" | "6680799" | "7084565" | "7589461").PN. OR ("7759861").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/02/22 17:06
S33	1	"20130002911".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2016/02/22 17:21
S34	1	"20080273793".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2016/02/22 17:23
S35	16	S30 and "345".clas.	USPAT	OR	ON	2016/02/22 17:24
S36	234	(organic adj light OLED) and square with arrangement	USPAT	OR	ON	2016/02/22 17:26
S37	365	(organic adj light OLED) and square with arrangement and red same green same blue	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/02/22 17:27
S38	74	(organic adj light OLED) and square with arrangement same red same green same blue	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/02/22 17:27
S39	5	(organic adj light OLED) and square near3 lattice same red same green same blue	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/02/22 18:42
S41	349	(organic adj light OLED) and square adj lattice	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/02/22 18:43
S42	246	(organic adj light OLED) and square	US-PGPUB;	OR	ON	2016/02/22

		near3 lattice and red same green same blue	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			18:44
S43	6	(organic adj light OLED) and square near3 lattice same diagonal	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/02/22 18:55
S45	30	(organic adj light OLED) and square same diagonal same red with green with blue	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/02/22 18:58
S46	558	(organic adj light OLED) and square same diagonal	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/02/23 13:43
S47	378	(organic adj light OLED) and square near3 lattice	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/02/23 13:45

EAST Search History (Interference)

< This search history is empty>

2/ 23/ 2016 4:56:38 PM
C:\ Users\ kyang\ Documents\ EAST\ Workspaces\ 13872018.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

CPC- SEARCHED		
Symbol	Date	Examiner
G09G3/3208 H01L27/3216 H01L27/3218	06/23/2015	KY

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST: Inventor Search and Assignee Search	06/23/2015	KY
EAST: Text Search	06/23/2015; 06/24/2015	KY
EAST: IDS Search	10/12/2015	KY
EAST: Updated Text Search	02/22/2016; 02/23/2016	KY

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/KWANG-SU YANG/ Primary Examiner.Art Unit 2691

REQUEST FOR CONTINUED EXAMINATION (RCE)
TRANSMITTAL

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on January 19, 2016 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Si Vuong

Application Number	:	13/872,018	Confirmation No. 4833
Filing Date	:	April 26, 2013	
Inventor(s)	:	Sang-Shin Lee	
Title	:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Group Art Unit	:	2691	
Examiner Name	:	Kwang-Su Yang	
Docket No.	:	**72827/S1437**	Date: January 19, 2016

MAIL TO: Mail Stop RCE

This is a Request for Continued Examination (RCE) under 37 CFR § 1.114 of the above-identified application.

This application is **not** an application of the kind specified in 37 CFR § 1.114(e).

1. THE STATUS OF THE APPLICATION IS AS FOLLOWS:
   a. __X__ Pending (no review proceedings active)
      (1) __X__ An Action was mailed by the Office on October 16, 2015, as to which no appeal under 37 CFR § 1.191 has been filed and
         __X__ a response under 37 CFR § 1.116 was filed on November 24, 2015
            ____ via Express Mail
            __X__ with certificate of electronic transmission under 37 CFR § 1.8
         __X__ that Action was a Final Rejection, the finality of which is to be withdrawn by this Request
         ____ an appeal or civil action under 35 U.S.C. 141,145 or 146 has been terminated
      (2) ____ Allowed: the Notice of Allowance was mailed by the Office on
         ____ the Issue Fee has not been paid
         ____ the Issue Fee has been paid **and** a petition under 37 CFR § 1.313 was granted on
   b. ____ Pending (with review proceeding active)
      An appeal under 37 CFR § 1.191 has been filed. **Applicant(s) hereby withdraw that appeal and request reopening of the prosecution of the application.**

BOE
Exhibit 1027 Page 476

REQUEST FOR CONTINUED EXAMINATION (RCE)
TRANSMITTAL

Application No. 13/872,018

2. SUBMISSION(S) REQUIRED (check at least one)
   a. Previously submitted
      _____ Consider the amendments/reply under 37 CFR § 1.116 previously filed on November 24, 2015
      _____ Consider the arguments in the Appeal or Reply Brief previously filed on
      _____ Other:
   b. Enclosed
      _____ Amendment/Reply
      _____ Affidavit(s)/Declaration(s)
      _____ Information Disclosure Statement
      _____ Documents under 37 CFR § 1.48
      _____ Petition for Extension of Time
      _____ Other:

Please direct all correspondence to **CUSTOMER NUMBER 23363**. Direct telephone calls to 626/795-9900, **LEWIS ROCA ROTHGERBER CHRISTIE LLP, P.O. Box 29001, Glendale, CA 91209-9001**.

Respectfully submitted,

LEWIS ROCA ROTHGERBER CHRISTIE LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/smv

REQUEST FOR CONTINUED EXAMINATION (RCE)
FEE CALCULATION SHEET

Application No. 13/872,018

PART I -- BASIC FILING FEE							
				Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Basic Filing Fee				1,200.00	600.00	300.00	1,200.00
PART II -- ADDITIONAL CLAIMS (compared to application before RCE)							
	Claims Remaining After Amendment	Highest Number Paid For	Number Extra Claims	Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Total Claims	15 -	* 20	= 0	x 80.00	40.00	20.00	0
Independent Claims	1 -	** 3	= 0	x 420.00	210.00	105.00	0
First Presentation of Multiple Dependent Claims				780.00	390.00	195.00	0
TOTAL FILING FEE							$1,200.00
LIST INDEPENDENT CLAIMS: 1							
* IF THE "HIGHEST NUMBER OF TOTAL CLAIMS PREVIOUSLY PAID FOR" IS 20 OR LESS, WRITE "20" IN THIS SPACE ** IF HIGHEST NUMBER OF INDEPENDENT CLAIMS PREVIOUSLY PAID FOR IS 3 OR LESS, WRITE "3" IN THIS SPACE							

1. FEES *(The RCE fee under 37 CFR § 1.17(e) is required by 37 CFR § 1.114 when the RCE is filed.)*

   a. Amount (total from Fee Calculation Sheet)

   The fee of $1,200.00 is submitted herewith.

   b. __X__ The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required for this transaction to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

SMV PAS1399607.1-*-01/19/16 3:43 PM

BOE
Exhibit 1027 Page 478

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Young E. Jeon/Si Vuong
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for Continued Examination	1801	1	1200	1200
		Total in USD ($)		**1200**

Electronic Acknowledgement Receipt

EFS ID:	24665285
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Si Vuong
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	19-JAN-2016
Filing Date:	26-APR-2013
Time Stamp:	20:29:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1200
RAM confirmation Number	7790
Deposit Account	031728
Authorized User	JEON, JUN-YOUNG E.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 CFR 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	72827_RCE_120815.pdf	309247 5852e932f98baacb049e54dd5116b60d406ff7bd	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30614 27884b705b1cf53d5391c2f142a75c9734495a8e	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	339861		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office action dated December 2, 2015, for cross reference U.S. Patent application 13/614,197, (12 pages)

DLG PAS1394665.1-*-12/16/15 1:36 PM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

JEJ/dg

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Young E. Jeon/Diane Goss
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	24386790
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Diane Goss
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	16-DEC-2015
Filing Date:	26-APR-2013
Time Stamp:	18:35:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	5882
Deposit Account	
Authorized User	
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		72827ids.pdf	118968 406ac2aad9b2f03d47187f5b0740066fa98b8dce	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Non Patent Literature	USOA4197-02DEC2015.pdf	1136722 f294ab2017aa87202b84a7b0d6142a967eaf2e03	no	12
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30631 d1a6c209e3e85b93ab3d62caec90bce740d533a3	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1286321		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on December 16, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT WITH FEE UNDER 37 CFR §§ 1.97(d) AND 1.17(p)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
December 16, 2015

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is an information disclosure statement listing a reference that is known to applicant. A copy of the listed Other Documents reference is enclosed.

It is respectfully requested that the listed reference be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of the information disclosure statement be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Applicant's undersigned attorney hereby certifies, in accordance with 37 CFR § 1.97(e)(2), that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in Section 1.56(c) more than three months prior to the filing of the information disclosure statement.

The processing fee of $180.00 as required by 37 CFR § 1.17(p) is submitted herewith. The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/dg
Enclosures: Information Disclosure Statement, w/reference

DLG PAS1394667.1-*-12/16/15 1:39 PM

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 12/08/2015
CHRISTIE, PARKER & HALE, LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER	
YANG, KWANG-SU	

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
12/08/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@cph.com
pair_cph@firsttofile.com

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 13/872,018	**Applicant(s)** LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	**Art Unit** 2691	**AIA (First Inventor to File) Status** No

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

THE REPLY FILED 24 November 2015 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires _____months from the mailing date of the final rejection.
   b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.
   Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☒ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: *See Continuation Sheet*. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): (a) ☒ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☐ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: _____.
13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
14. ☐ Other: _____.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:
    Claim(s) allowed: .
    Claim(s) objected to: 11.
    Claim(s) rejected: 1-5, 7-10 and 12-17.
    Claim(s) withdrawn from consideration: .

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

Continuation of 3. NOTE: The amended limitations in claims 1, 8, 11 and 16 raise new issues that would require further consideration and/or search since they were not presented before.

BOE
Exhibit 1027 Page 493

NOT ENTER
/KY/
11/30/2015

PATENT
RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2691

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 24, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Debra Thomas

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	
Customer No.	: 23363	

AMENDMENT AFTER FINAL ACTION

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
November 24, 2015

Commissioner:

In response to the final Office action of October 16, 2015 (hereinafter "the Office action"), please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

PATENT
RESPONSE UNDER 37 CFR 1.116
EXPEDITED PROCEDURE
EXAMINING GROUP 2691

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 24, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Debra Thomas

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	
Customer No.	: 23363	

AMENDMENT AFTER FINAL ACTION

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
November 24, 2015

Commissioner:

In response to the final Office action of October 16, 2015 (hereinafter "the Office action"), please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

BOE
Exhibit 1027 Page 495

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:

a plurality of pixels, the pixels being minimum units for displaying an image and comprising:

a first pixel having a center coinciding with a center of a virtual square;

another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;

a second pixel separated from the first [[pixel]] pixels and having a center at [[a]] the first vertex ~~of the virtual square~~; and

a third pixel separated from the first [[pixel]] pixels and the second pixel, and having a center at [[a]] the second vertex ~~neighboring the first vertex of the virtual square~~,

wherein the first pixel, the second pixel, and the third pixel have polygonal shapes.

2. (Original) The pixel arrangement structure of claim 1, wherein
the second pixel comprises a pair of second pixels, and
the second pixels are separated from each other by the first pixel.

3. (Original) The pixel arrangement structure of claim 1, wherein
the third pixel comprises a pair of third pixels, and
the third pixels are separated from each other by the first pixel.

4. (Original) The pixel arrangement structure of claim 1, wherein
the second pixel comprises a pair of second pixels,

the third pixel comprises a pair of third pixels, and

the second pixels and the third pixels enclose the first pixel in the virtual square.

5. (Original) The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

6. (Canceled)

7. (Previously presented) The pixel arrangement structure of claim 5, wherein the first pixel has an octagonal shape, and

one of the second pixel and the third pixel has a hexagonal shape and another of the second pixel and the third pixel has a quadrilateral shape.

8. (Currently amended) The pixel arrangement structure of claim 7, wherein

~~the virtual square comprises a pair of virtual squares sharing a common side,~~

~~the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares, and~~

the first pixels have octagonal shapes that are symmetrical to each other.

9. (Original) The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. (Original) The pixel arrangement structure of claim 9, wherein a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length.

11. (Currently amended) The pixel arrangement structure of claim 10, wherein

~~the virtual square comprises a pair of virtual squares sharing a common side,~~

~~the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares,~~

a distance between each of the second pixels and the third pixels is a same second length, and

a distance between the first pixels is a third length that is longer than the first length and the second length.

12. (Original) The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. (Previously presented) The pixel arrangement structure of claim 1, wherein
the first pixel is configured to emit green light,
one of the second pixel and the third pixel is configured to emit blue light, and
another of the second pixel and the third pixel is configured to emit red light.

14. (Previously presented) The pixel arrangement structure of claim 5, wherein
the first pixel has an octagonal shape, and
at least one of the second pixel and the third pixel has a hexagonal shape.

15. (Canceled)

16. (Currently amended) The pixel arrangement structure of claim 1, ~~further comprising another first pixel having a center that is collinear with the center of the virtual square and~~
wherein the first vertex and the centers of the first pixels are collinear, and
wherein the first pixels are separated from each other by only the second pixel.

17. (Previously presented) The pixel arrangement structure of claim 1, wherein the second pixel has a different polygonal shape from the third pixel.

REMARKS/ARGUMENTS

Claims 1–5 and 7–14, and 16–17 are pending in the present application, of which claim 1 is independent. Claim 11 is allowable. Claim 15 is canceled herein without prejudice and its claim language incorporated into claim 1. Claims 1, 8, 11, and 16 are amended herein and find support in at least ¶ [0033] of the application as filed. The Applicant respectfully requests continued allowability of claim 11, and reconsideration and allowance of claims 1–5, 7–10, 12-14, and 16–17.

Rejection of claims 1–5 and 12 under 35 U.S.C. § 102(b) by Brown Elliott

Rejection of claim 16 & former claim 15 under 35 USC § 103(a) over Brown Elliott/Smith

According to page 2 of the Office action, "Claims 1–5 and 12 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by [Brown] Elliot (U.S. Patent No. US 7,274,383 B1)." According to page 9 of the Office action, "Claims 15–16 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over [Brown] Elliot in view of Smith (U.S. Pub. No. US 2009/0302331 A1)." The Applicant incorporates claim 15 into claim 1, further amends claims 1, and respectfully argues as follows.

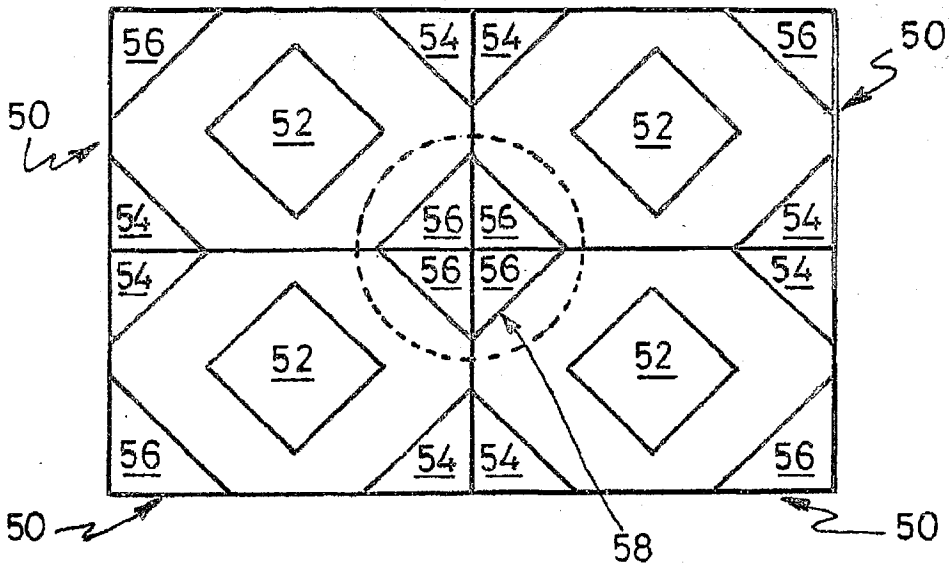
Independent claim 1 now recites:

> 1. A pixel arrangement structure of an organic light emitting diode (OLED) display, comprising:
>
> a plurality of pixels, the pixels being minimum units for displaying an image and comprising:
>
> a first pixel having a center coinciding with a center of a virtual square;
>
> another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light;
>
> a second pixel separated from the first pixels and having a center at the first vertex; and
>
> a third pixel separated from the first pixels and the second pixel, and having a center at the second vertex,
>
> wherein the first pixel, the second pixel, and the third pixel have polygonal shapes. (Emphasis added.)

The cited references, alone or in combination, do not disclose or suggest at least the claim 1 limitation, "the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light," in combination with the claim 1 limitations, "the pixels being minimum units for displaying an image," and "a second pixel separated from the first pixels and having a center at the first vertex." By way of example, Brown Elliott does not disclose this limitation of claim 1. See, for example, page 9 of the Office action, "[Brown] Elliot does not teach . . . the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light."

To establish a prima facie case of anticipation, the cited reference must disclose every limitation of the rejected claim. Since Brown Elliott does not disclose at least one limitation of claim 1, Brown Elliott does not anticipate claim 1, so the Applicant respectfully requests that the § 102(b) rejection of claim 1 be withdrawn and that this claim be allowed.

Further, the addition of Smith does not cure this deficiency of Brown Elliott to support a § 103(a) rejection of claim 1. By way of example, Smith does not disclose this limitation of claim 1 in FIG. 5 (reproduced below and cited on page 9 of the Office action). While page 9 of the Office action appears to assert that Smith FIG. 5 discloses this limitation of claim 1 by equating pixels 50 and color-forming region 58 (including four green sub-pixels 56) of Smith FIG. 5 with "virtual squares" and "a second pixel," respectively, as recited in former claim 15 (and now incorporated into claim 1), the color forming region 58 of Smith FIG. 5 ("second pixel" of claim 1) is not one of the "minimum units for displaying an image" as now recited in claim 1. Rather, as described in Smith ¶ [0060], "The discrete colo[]r-forming region 58 has four separately addressable portions, each portion contributing a sub-pixel [56] to one of the four pixels shown."



Smith FIG. 5

For at least these reasons, Brown Elliott and Smith together do not disclose or suggest at least the claim 1 limitation, "the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light," in combination with the claim 1 limitations, "the pixels being minimum units for displaying an image," and "a second pixel separated from the first pixels and having a center at the first vertex," and there is no apparent reason why one of ordinary skill in the art at the time of the present invention would have combined Brown Elliott and Smith to arrive at the claimed embodiment of claim 1. Accordingly, claim 1 is patentably distinguishable over Brown Elliott and Smith.

Furthermore, claims 2–5, 12, and 16 depend from claim 1, such that they incorporate all of the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish these claims over the art of record. Accordingly, the Applicant respectfully requests that the § 102(b) rejection of claims 2–5 and 12, and the § 103(a) rejection of claim 16 be withdrawn and that these claims be allowed.

Rejection of claims 7–8, 14, and 17 under 35 U.S.C. § 103(a) over Brown Elliott/Chao

Rejection of claims 9–10 under 35 U.S.C. § 103(a) over Brown Elliott/Chao/Cok

Rejection of claim 13 under 35 U.S.C. § 103(a) over Brown Elliott/Kim

According to page 4 of the Office action, "Claims 7, 8, 14 and 17 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over [Brown] Elliot in view of Chao (U.S[.] Pub. No. US 2008/0001525 A1)." According to page 7 of the Office action, "Claims 9-10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over [Brown] Elliot in view of Chao as applied to claim 7, and further in view of Cok (U.S[.] Patent No. US 6,867,549 B2)." According to page 8 of the Office action, "Claim 13 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over [Brown] Elliot in view of Kim (U.S[.] Pub. No. US 2011/0012820 A1)." The Applicant respectfully argues as follows.

Claim 1 is patentably distinguishable over Brown Elliott (and Smith) as discussed above. Further, the addition of Chao, Kim, or Cok does not cure the above deficiency of Brown Elliott to support a § 103(a) rejection of claim 1. Chao, Kim, and Cok are cited on pages 4–9 of the Office action for disclosing various limitations of claims 7–10, 13–14, and 17. However, Chao, Kim, and Cok, like Brown Elliott and Smith, appears to be silent regarding the claim 1 limitation, "the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light," in combination with the claim 1 limitations, "the pixels being minimum units for displaying an image," and "a second pixel separated from the first pixels and having a center at the first vertex," and there is no apparent reason why one of ordinary skill in the art at the time of the present invention would have combined Brown Elliott and Chao, Kim, or Cok to arrive at the claimed embodiment of claim 1. Accordingly, claim 1 is patentably distinguishable over Brown Elliott and Chao, Kim, or Cok.

Furthermore, claims 7–10, 13–14, and 17 depend from claim 1, such that they incorporate all of the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish these claims over the art of record. Accordingly, the Applicant

respectfully requests that the § 103(a) rejections of claims 7–10, 13–14, and 17 be withdrawn and that these claims be allowed.

Concluding remarks

In view of the foregoing amendments and remarks, the Applicant respectfully requests a Notice of Allowance for claims 1–5, and 7–14, and 16–17. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call the Applicant's attorney at the number listed below.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By Bruce A. Wagar
Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/dst

DST PAS1385683.3-*-11/24/15 10:06 AM

Electronic Acknowledgement Receipt

EFS ID:	24184197
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Bruce A. Wagar/Debra Thomas
Filer Authorized By:	Bruce A. Wagar
Attorney Docket Number:	72827/S1437
Receipt Date:	24-NOV-2015
Filing Date:	26-APR-2013
Time Stamp:	19:32:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	72827_TransmittalAAF.pdf	94597 cb71d8ddfe45748c5fba4eb8e8c422569534f1c5	no	2

Warnings:	
Information:	

2		72827_AAF.pdf	550324 894c4e400c2af38d38dccf25caff6248b8caa4b4	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Claims	2	4
	Applicant Arguments/Remarks Made in an Amendment	5	9

Warnings:	
Information:	
Total Files Size (in bytes):	644921

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

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AMENDMENT TRANSMITTAL LETTER

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 24, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Debra Thomas

Inventor : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Kwang-Su Yang

Docket No. : 72827/S1437

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
November 24, 2015

Commissioner:

Enclosed is an amendment to the above-identified application.

CLAIMS AS AMENDED							
	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra Claims	Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Total Claims	15 -	* 20	= 0	0 x $80.00	$40.00	$20.00	$0.00
Independent Claims	1 -	** 3	= 0	0 x $420.00	$210.00	$105.00	$0.00
Multiple Dependent Claims***				$780.00	$390.00	$195.00	$0.00
						Total Additional Fee	$0.00
List Independent Claims: 1							

* If the "Highest Number of Total Claims Previously Paid For" is less than 20, enter "20" in this space
** If the "Highest Number of Independent Claims Previously Paid For" is less than 3, enter "3" in this space
*** Pay this fee only when "Multiple Dependent Claims" are added for the first time

__X__ No additional fee is required.

_____ A Petition for Extension of Time and the required fee are enclosed.

_____ Other enclosures: _____

Amendment Transmittal Letter
Application No. 13/872,018

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by or to give effect to this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

CHRISTIE, PARKER & HALE, LLP

By Bruce A. Wagar

Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/dst

DST PAS1390995.1-*-11/24/15 11:01 AM

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/872,018	Filing Date 04/26/2013	☒ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **11/24/2015**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					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 number found in the appropriate box in column 1.

SLIE
/NICHELE PETERSON/

This collection of information is required by 37 CFR 1.16. 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, 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.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 10/16/2015
CHRISTIE, PARKER & HALE, LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER	
YANG, KWANG-SU	

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
10/16/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@cph.com
pair_cph@firsttofile.com

Office Action Summary	Application No. 13/872,018	Applicant(s) LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09/29/2015*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-5 and 7-17* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,7-10 and 12-17* is/are rejected.

8)☒ Claim(s) *11* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Response to Amendment

2. The amendment filed on 09/29/2015 has been entered and considered by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5 and 12 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Elliot (U.S. Patent No. US 7,274,383 B1).

As to claim 1, Elliot (Figs. 1-3) teaches **a pixel arrangement structure** (an arrangement of a three-color pixel element; Fig. 1A) **of an organic light emitting diode display** (an organic light emitting diode display; col. 10, lines 24-27)**, comprising:**

- **a first pixel** (a blue emitter 12) **having a center coinciding with a center of a virtual square** (Fig. 1A)**;**
- **a second pixel** (a green emitter 16) **separated from the first pixel** (the blue emitter 12) **and having a center at a first vertex of the virtual square** (Fig. 1A)**; and**
- **a third pixel** (a red emitter 14) **separated from the first pixel** (the blue emitter 12) **and the second pixel** (the green emitter 16) (Fig. 1A)**, and having a center at a**

second vertex neighboring the first vertex of the virtual square (Fig. 1A)**,**

- **wherein the first pixel, the second pixel, and the third pixel have polygonal shapes** (Fig. 1A)**.**

As to claim 2, Elliot teaches

- **wherein the second pixel** (the green emitter 16) **comprises a pair of second pixels** (top right and bottom left green emitters 16)**, and the second pixels are separated from each other by the first pixel** (Fig. 1A)**.**

As to claim 3, Elliot teaches

- **wherein the third pixel** (the red emitter 14) **comprises a pair of third pixels** (top left and bottom right red emitters 14)**, and the third pixels are separated from each other by the first pixel** (Fig. 1A)**.**

As to claim 4, Elliot teaches

- **wherein the second pixel** (the green emitter 16) **comprises a pair of second pixels** (top right and bottom left green emitters 16)**, the third pixel** (the red emitter 14) **comprises a pair of third pixels** (top left and bottom right red emitters 14) (Fig. 1A)**, and the second pixels and the third pixels enclose the first pixel in the virtual square** (Fig. 1A)**.**

As to claim 5, Elliot teaches

- **wherein each of the second pixels and the third pixels is larger in area than**

the first pixel (each area of the green emitter 16 and the red emitter 14 is larger than that of the blue emitter 12) (Fig. 1A)**.**

As to claim 12, Elliot teaches

- **wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light** (the blue emitter 12, the green emitter 16, and the red emitter 14; Fig. 1A)**.**

Claim Rejections - 35 USC § 103

5. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 7, 8, 14 and 17 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Elliot in view of Chao (U.S Pub. No. US 2008/0001525 A1).

As to claim 7, Elliot teaches **the pixel arrangement structure of claim 5.**

Elliot does not teach **wherein the first pixel has an octagonal shape, and one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape.**

Chao (Figs. 1b,1c, 5a, 5b and 5d) teaches

- **wherein the first pixel has an octagonal shape, and one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the**

third pixel has a quadrilateral shape (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in an arrangement of color pixels of Elliot because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 8, Chao teaches

- **wherein the virtual square comprises a pair of virtual squares sharing a common side** (a line connecting subpixel R in a first row and a subpixel G in a third row in a fourth column in Fig. 5d; a virtual square can be formed by adjusting a5, b5, and c5 in Fig. 5b)**, the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares** (a subpixel G in a second row and in a third column and a subpixel G in a second row and in a fifth column; Fig. 5d)**, and the first pixels have octagonal shapes that are symmetrical to each other** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle, circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones

as taught by Chao in an arrangement of color pixels of Elliot because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 14, Elliot teaches **the pixel arrangement structure of claim 5.**

Elliot does not teach **wherein the first pixel has an octagonal shape, and at least one of the second pixel and the third pixel has a hexagonal shape.**

Chao (Figs. 1b,1c, 5a, 5b and 5d) teaches

- **wherein the first pixel has an octagonal shape, and at least one of the second pixel and the third pixel has a hexagonal shape** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle, circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in an arrangement of color pixels of Elliot because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 17, Elliot teaches **the pixel arrangement structure of claim 1.**

Elliot does not teach **wherein the second pixel has a different polygon shape from the third pixel.**

Chao (Figs. 1b,1c, 5a, 5b and 5d) teaches

- **wherein the second pixel has a different polygon shape from the third pixel** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in an arrangement of color pixels of Elliot because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

7. Claims 9-10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Elliot in view of Chao as applied to claim 7, and further in view of Cok (U.S Patent No. US 6,867,549 B2).

As to claim 9, Elliot and Chao teach **the pixel arrangement structure of claim 7.**

Elliot and Chao do not teach **wherein each of the second pixels is larger in area than each of the third pixels.**

Cok (Fig. 5) teaches

- **wherein each of the second pixels** (the green light emitting element 14) **is larger in area than each of the third pixels** (the red light emitting element 12) (Fig. 5)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced an arrangement of a three-color pixel element as taught by Cok for an arrangement of Elliot as modified by Chao because the

pixel size of the blue component relative to the red or green may be larger to cause the pixel elements to age at a common rate.

As to claim 10, Elliot teaches

- **wherein a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length** (a distance between the center of blue emitter 22 and the center of green emitter 26, and a distance between the center of blue emitter 22 and the center of red emitter 24 are a same length; Fig. 1B)**.**

8. Claim 13 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Elliot in view of Kim (U.S Pub. No. US 2011/0012820 A1).

As to claim 13, Elliot teaches **the pixel arrangement structure of claim 12.**

Elliot does not teach **wherein the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and another of the second pixel or the third pixel is configured to emit red light.**

Kim (Figs. 1, 2 and 4) teaches

- **wherein the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and another of the second pixel or the third pixel is configured to emit red light** (a first sub-pixels G 12, a second sub-pixels B 14, a third sub-pixels R 16; Figs. 1, 2 and 4)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have exchange blue pixels and green pixels as taught by

Kim in a pixel arrangement of Elliot because the exchange of pixels may be changed based on the factors, for example, the life of materials respectively utilized in each color sub-pixel for balancing the lives of sub-pixels.

9. Claims 15-16 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Elliot in view of Smith (U.S. Pub. No. US 2009/0302331 A1).

As to claim 15, Elliot teaches **the pixel arrangement structure of claim 1.** Elliot does not teach **further comprising another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light.**

Smith (Figs. 5 and 15) teaches **further comprising**

- **another first pixel** (a central blue sub-pixel 52) **having a center coinciding with a center of another virtual square** (Figs. 5 and 15) (the pixels may, for example, have a square shape so that the virtual squares become square; [0071], lines 1-4)**, the virtual squares sharing a common** side (e.g., a middle vertical line between two bottom pixels 50) **having endpoints at a common first vertex** (a center of the green sub-pixel 56) **and a common second vertex** (a center of the red sub-pixel 54) (Fig. 5) **of the virtual squares** (Figs 5 and 15)**, with neighboring vertices in each of the virtual squares corresponding to pixels** (the green sub-pixel 56 and the red sub-pixel 54) **configured to emit different color light** (Fig. 5)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to have replaced a pixel arrangement as taught by Smith for an arrangement of Elliot because the arrangement provides enhanced resolution and may be most effective where pixel sizes are on the edge of the eye's spatial resolution.

As to claim 16, Elliot teaches **the pixel arrangement structure of claim 1.**

Elliot does not teach **further comprising another first pixel having a center that is collinear with the center of the virtual square and the first vertex, wherein the first subpixels are separated from each other by only the second pixel.**

Smith (Figs. 5 and 15) teaches **further comprising another first pixel** (a top right blue sub-pixel 52) **having a center that is collinear with the center of the virtual square and the first vertex** (a bottom left blue sub-pixel 52) (Figs. 5 and 15)**, wherein the first pixels** (the bottom left blue sub-pixel 52 and the top right blue sub-pixel 52) **are separated from each other by only the second pixel** (the center green sub-pixel 56) (Figs. 5 and 15)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced a pixel arrangement as taught by Smith for an arrangement of Elliot because the arrangement provides enhanced resolution and may be most effective where pixel sizes are on the edge of the eye's spatial resolution.

Allowable Subject Matter

10. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

11. Applicant's arguments filed 09/29/2015 have been fully considered but they are not persuasive.

As to claim 1, Applicant argues that Elliot does not disclose at least the claim 1 limitations, "a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square," in combination with the other limitations of claim 1, such as " a first pixel having a center coinciding with a center of a virtual square." However, the Office respectfully disagrees. Elliot teaches that the "center" of the green emitter 16 and the center of the red emitter 14 correspond to the "first vertex of the virtual square," and the "second vertex neighboring the first vertex of the virtual square," respectively, as recited in claim 1. Applicant argues that since the red emitter 14 and the green emitter 14 appear to have five sides, Elliot does not disclose the limitations. However, the **symmetry** of two green emitters 16 and two red emitters 14 with respect to the center of the blue emitter 12 and the **symmetry** of a pair the green emitter 16 and the red emitter 14 **horizontally and vertically** generate **a virtual square** with the centers of the green emitters 16 and the red emitters. The center of the green emitter 16, which is located at top right position, corresponds to a center at a first vertex and the center of the red emitter 14, which is located at top left position, corresponds to a center at a second vertex.

Therefore, the Office maintains the rejections as recited above.

Conclusion

12. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiry

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang-Su Yang whose telephone number is 571-270-7307. The examiner can normally be reached on Mon-Fri during 9:00am-6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. 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).

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

Notice of References Cited	Application/Control No. 13/872,018	Applicant(s)/Patent Under Reexamination LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	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-2009/0302331 A1	12-2009	Smith; Euan	H01L27/3218	257/88
	B	US-				
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

✓	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	06/24/2015	10/12/2015							
	1	✓	✓							
	2	✓	✓							
	3	✓	✓							
	4	✓	✓							
	5	✓	✓							
	6	N	-							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	✓							
	11	O	O							
	12	✓	✓							
	13	✓	✓							
	14	✓	✓							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

CPC- SEARCHED		
Symbol	Date	Examiner
G09G3/3208 H01L27/3216 H01L27/3218	06/23/2015	KY

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST: Inventor Search and Assignee Search	06/23/2015	KY
EAST: Text Search	06/23/2015; 06/24/2015	KY
EAST: IDS Search	10/12/2015	KY

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/KWANG-SU YANG/ Primary Examiner.Art Unit 2691

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	10	("8026869" "8330352" "20120319564").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/10/12 19:30

EAST Search History (Interference)

< This search history is empty>

10/ 12/ 2015 7:32:22 PM
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FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		8,026,869 B2	09-27-2011	Takagi et al.
		8,330,352 B2	12-11-2012	Sung et al.
		2012/0319564 A1	12-20-2012	Ghosh et al.

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office action dated July 15, 2015, for cross reference U.S. Patent application 13/614,197, (11 pages)

DLG PAS1367330.1-*-07/16/15 10:19 AM

EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	10/12/2015

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

JEJ/dg

Sheet 1 of 1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /KY/

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on September 29, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Debra S. Thomas

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	
Customer No.	: 23363	

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
September 29, 2015

Commissioner:

In response to the Office action of June 30, 2015 (hereinafter "the Office action"), please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Amendments to the Drawings begin on page 5 of this paper and include an attached replacement sheet.

Remarks/Arguments begin on page 6 of this paper.

An **Appendix** including an amended drawing is attached following page 10 of this paper.

BOE
Exhibit 1027 Page 528

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A pixel arrangement structure of an organic light emitting diode display, comprising:

a first pixel having a center coinciding with a center of a virtual square;

a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and

a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square,

wherein the first pixel, the second pixel, and the third pixel have polygonal shapes.

2. (Original) The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels, and

the second pixels are separated from each other by the first pixel.

3. (Original) The pixel arrangement structure of claim 1, wherein

the third pixel comprises a pair of third pixels, and

the third pixels are separated from each other by the first pixel.

4. (Original) The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels,

the third pixel comprises a pair of third pixels, and

the second pixels and the third pixels enclose the first pixel in the virtual square.

5. (Original) The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

BOE
Exhibit 1027 Page 529

6. (Canceled)

7. (Currently amended) The pixel arrangement structure of claim 5, wherein

the first pixel has an octagonal shape, and

one of the second pixel [[or]] and the third pixel has a hexagonal shape and another of the second pixel [[or]] and the third pixel has a quadrilateral shape.

8. (Original) The pixel arrangement structure of claim 7, wherein

the virtual square comprises a pair of virtual squares sharing a common side,

the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares, and

the first pixels have octagonal shapes that are symmetrical to each other.

9. (Original) The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. (Original) The pixel arrangement structure of claim 9, wherein a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length.

11. (Original) The pixel arrangement structure of claim 10, wherein

the virtual square comprises a pair of virtual squares sharing a common side,

the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares,

a distance between each of the second pixels and the third pixels is a same second length, and

a distance between the first pixels is a third length that is longer than the first length and the second length.

12. (Original) The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. (Currently amended) The pixel arrangement structure of ~~claim 12~~ claim 1, wherein

the first pixel is configured to emit green light,

one of the second pixel [[or]] and the third pixel is configured to emit blue light, and

another of the second pixel [[or]] and the third pixel is configured to emit red light.

14. (Previously presented) The pixel arrangement structure of claim 5, wherein

the first pixel has an octagonal shape, and

at least one of the second pixel and the third pixel has a hexagonal shape.

15. (New) The pixel arrangement structure of claim 1, further comprising another first pixel having a center coinciding with a center of another virtual square, the virtual squares sharing a common side having endpoints at a common first vertex and a common second vertex of the virtual squares, with neighboring vertices in each of the virtual squares corresponding to pixels configured to emit different color light.

16. (New) The pixel arrangement structure of claim 1, further comprising another first pixel having a center that is collinear with the center of the virtual square and the first vertex, wherein the first pixels are separated from each other by only the second pixel.

17. (New) The pixel arrangement structure of claim 1, wherein the second pixel has a different polygonal shape from the third pixel.

Amendments to the Drawings:

Please replace the sheet of drawings including FIG. 6 of the substitute drawing filed on June 1, 2015 with the following amended sheet, which includes changes to FIG. 6 (specifically, the legend "FIG. 6" has been re-oriented to be consistent with the orientation of the remainder of the drawing; an incorrect replacement drawing was inadvertently submitted with the June 1, 2015 response).

Attachment: Replacement Sheet

BOE
Exhibit 1027 Page 532

REMARKS/ARGUMENTS

Claims 1–5 and 7–17 are pending in the present application, of which claim 1 is independent. Claim 6 is canceled herein without prejudice. Claims 7 and 13 are corrected herein as required by the Office action. FIG. 6 is amended to re-orient the legend "FIG. 6" to be consistent with the orientation of the rest of the drawing (please note that an incorrect replacement drawing was inadvertently filed in the Applicant's June 1, 2015 response). Claims 15–17 are new and find support in at least FIG. 6 as amended herein. The Applicant respectfully requests continued allowability of claim 11, examination on the merits and allowance of claims 15–17, and reconsideration and allowance of claims 1–5, 7–10, and 12–14.

Rejection of claims 1–5 and 12 under 35 U.S.C. § 102(b) by Brown Elliott

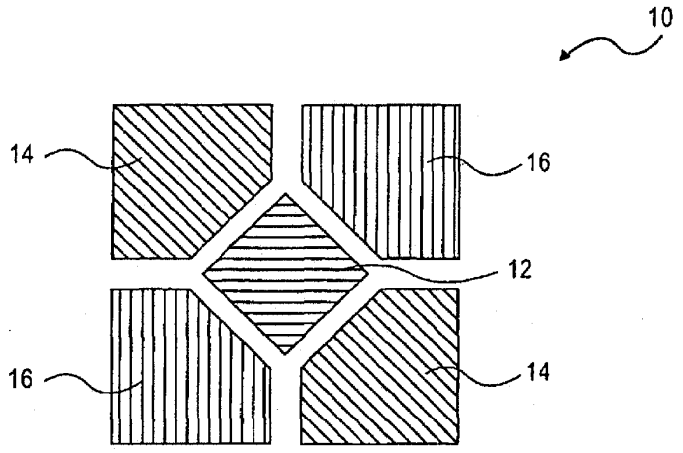
According to page 3 of the Office action, "Claims 1-5 and 12 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by [Brown] Elliot (U.S. Patent No. US 7,274,383 B1)." The Applicant respectfully traverses as follows.

Independent claim 1 recites:

> 1. A pixel arrangement structure of an organic light emitting diode display, comprising:
> a first pixel having a center coinciding with a center of a virtual square;
> a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and
> a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square,
> wherein the first pixel, the second pixel, and the third pixel have polygonal shapes. (Emphasis added.)

Brown Elliott does not disclose at least the claim 1 limitations, "a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square," in combination with the other limitations of claim 1, such as "a first pixel having a center coinciding with a center of a virtual square." While pages 3–4 of the Office action assert that Brown Elliott FIG. 1A (reproduced below)

anticipates claim 1 by equating blue emitter 12, red emitter 14, and green emitter 16 with "a first pixel," "a second pixel," and "a third pixel," respectively, as recited in claim 1, the Office action is silent on what corresponds to the "center" of the red emitter 14 ("second pixel"), the "center" of the green emitter 16 ("third pixel"), the "first vertex of the virtual square," and the "second vertex neighboring the first vertex of the virtual square," as recited in claim 1.



Brown Elliott

FIG. 1A

Brown Elliott is equally silent, describing (on column 3, line 10) the red emitters 14 and the green emitters 16 as being "generally square shaped," yet these emitters appear to have five sides in FIG. 1A. For at least these reasons, Brown Elliott does not disclose at least the claim 1 limitations, "a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square," in combination with the other limitations of claim 1, such as "a first pixel having a center coinciding with a center of a virtual square."

To establish a prima facie case of anticipation, the cited reference must disclose every limitation of the rejected claim. Since Brown Elliott does not disclose at least one limitation of

claim 1, Brown Elliott does not anticipate claim 1. Furthermore, claims 2–5 and 12 depend from claim 1, such that they incorporate all of the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish these claims over the art of record. Accordingly, the Applicant respectfully requests that the § 102(b) rejection of claims 1–5 and 12 be withdrawn and that these claims be allowed.

Rejection of claims 7–8 and 14 under 35 U.S.C. § 103(a) over Brown Elliott/Chao

According to page 5 of the Office action, "Claims 7, 8 and 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over [Brown] Elliot in view of Chao (U.S[.] Pub. No. US 2008/0001525 A1)." The Applicant respectfully traverses as follows.

Claim 1 is patentably distinguishable over Brown Elliott for at least the reasons discussed above. Further, the addition of Chao does not cure the above deficiency of Brown Elliott to support a § 103(a) rejection of claim 1. Chao is cited on pages 6–7 of the Office action for the proposition that it discloses claim 8 limitations directed to virtual squares sharing a common side. However, Chao, like Brown Elliott, appears to be silent regarding the claim 1 limitations, "a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square," in combination with the other limitations of claim 1, such as "a first pixel having a center coinciding with a center of a virtual square."

For at least these reasons, claim 1 is patentably distinguishable over Brown Elliott and Chao. Furthermore, claims 7–8 and 14 depend from claim 1, such that they incorporate all of the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish these claims over the art of record. Accordingly, the Applicant respectfully requests that the § 103(a) rejection of claims 7–8 and 14 be withdrawn and that these claims be allowed.

Rejection of claims 9–10 under 35 U.S.C. § 103(a) over Brown Elliott/Chao/Cok

Rejection of claim 13 under 35 U.S.C. § 103(a) over Brown Elliott/Kim

According to page 8 of the Office action, "Claims 9-10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over [Brown] Elliot in view of Chao as applied to claim 7, and further in view of Cok (U.S[.] Patent No. US 6,867,549 B2)." According to page 9 of the Office action, "Claim 13 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over [Brown] Elliot in view of Kim (U.S[.] Pub. No. US 2011/0012820 A1)." The Applicant respectfully traverses as follows.

Independent claim 1 is patentably distinguishable over Brown Elliott and Chao as discussed above. Further, the addition of Cok or Kim does not cure the above deficiency of Brown Elliott and Chao to support a § 103(a) rejection of claim 1. Cok and Kim are cited on pages 8–9 of the Office action for disclosing limitations of claims 9 and 13, respectively. However, Cok and Kim, like Brown Elliott and Chao, appear to be silent with regard to the claim 1 limitations, "a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square," in combination with the other limitations of claim 1, such as "a first pixel having a center coinciding with a center of a virtual square." Accordingly, claim 1 is patentably distinguishable over any combination of Brown Elliott, Chao, Cok, and Kim.

Claims 9–10 and 13 depend from claim 1, such that they incorporate all of the terms and limitations of claim 1 in addition to other limitations, which together further patentably distinguish these claims over the art of record. Accordingly, the Applicant respectfully requests that the § 103(a) rejection of claims 9–10 and 13 be withdrawn and that these claims be allowed.

New claims 15–17

Claims 15–17 are and depend from claim 1. Accordingly, they incorporate all of the terms and limitations of claim 1 in addition to other limitations, which together further

patentably distinguish these claims over the art of record. Accordingly, the Applicant respectfully requests allowance of claims 15–17.

Concluding remarks

In view of the foregoing amendments and remarks, the Applicant respectfully requests a Notice of Allowance for claims 1–5 and 7–17. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call the Applicant's attorney at the number listed below.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By Bruce A. Wagar
Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/baw

PAS1367413.3-*-09/29/15 5:23 PM

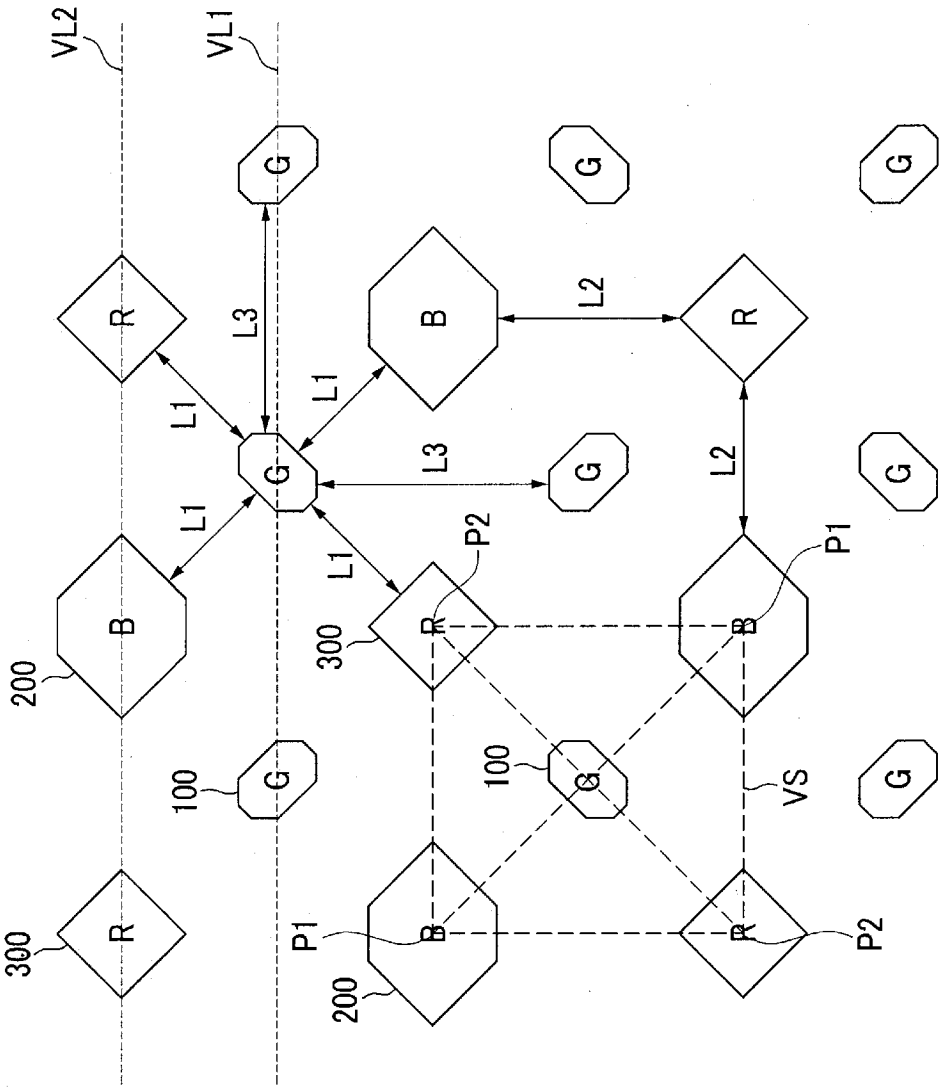


FIG. 6

Electronic Acknowledgement Receipt

EFS ID:	23642714
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Bruce A. Wagar/Debra Thomas
Filer Authorized By:	Bruce A. Wagar
Attorney Docket Number:	72827/S1437
Receipt Date:	29-SEP-2015
Filing Date:	26-APR-2013
Time Stamp:	22:03:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	72827_Transmittal.pdf	105582 68cc234c37533a5f700b5e3afac4bfd471b910a1	no	2

Warnings:	
Information:	

2		72827_Amendment.pdf	555227 9ad0bb1cd9f5a942c0521af8df37fb7cc3bdab40	yes	11

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	4
Drawings-other than black and white line drawings	5	5
Applicant Arguments/Remarks Made in an Amendment	6	10
Drawings-only black and white line drawings	11	11

Warnings:	
Information:	
Total Files Size (in bytes):	660809

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New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
AMENDMENT TRANSMITTAL LETTER

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on September 29, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Debra S. Thomas

Inventor : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Kwang-Su Yang

Docket No. : 72827/S1437

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
September 29, 2015

Commissioner:

Enclosed is an amendment to the above-identified application.

CLAIMS AS AMENDED							
	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra Claims	Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Total Claims	16 -	* 20	= 0	0 x $80.00	$40.00	$20.00	$0.00
Independent Claims	1 -	** 3	= 0	0 x $420.00	$210.00	$105.00	$0.00
Multiple Dependent Claims***				$780.00	$390.00	$195.00	$0.00
						Total Additional Fee	$0.00
List Independent Claims: 1							
* If the "Highest Number of Total Claims Previously Paid For" is less than 20, enter "20" in this space ** If the "Highest Number of Independent Claims Previously Paid For" is less than 3, enter "3" in this space *** Pay this fee only when "Multiple Dependent Claims" are added for the first time							

__X__ No additional fee is required.

_____ A Petition for Extension of Time and the required fee are enclosed.

_____ Other enclosures: _____

Amendment Transmittal Letter
Application No. 13/872,018

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by or to give effect to this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

CHRISTIE, PARKER & HALE, LLP

By Bruce A. Wagar

Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/dst

DST PAS1381226.1-*-09/29/15 5:34 PM

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
AMENDMENT TRANSMITTAL LETTER

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on September 29, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Debra S. Thomas

Inventor : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Kwang-Su Yang

Docket No. : 72827/S1437

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P.O. Box 1450
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Multiple Dependent Claims***				$780.00	$390.00	$195.00	$0.00
						Total Additional Fee	$0.00
List Independent Claims: 1							
* If the "Highest Number of Total Claims Previously Paid For" is less than 20, enter "20" in this space ** If the "Highest Number of Independent Claims Previously Paid For" is less than 3, enter "3" in this space *** Pay this fee only when "Multiple Dependent Claims" are added for the first time							

__X__ No additional fee is required.

_____ A Petition for Extension of Time and the required fee are enclosed.

_____ Other enclosures: _____

Amendment Transmittal Letter
Application No. 13/872,018

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by or to give effect to this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

CHRISTIE, PARKER & HALE, LLP

By Bruce A. Wagar

Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/dst

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DocCode – SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: 13872018 Document Date: 09/29/2015

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Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/872,018	Filing Date 04/26/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **09/29/2015**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 16	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					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 number found in the appropriate box in column 1.

LIE
/ROSA WEST/

This collection of information is required by 37 CFR 1.16. 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, 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.**
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FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE** **STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		8,026,869 B2	09-27-2011	Takagi et al.
		8,330,352 B2	12-11-2012	Sung et al.
		2012/0319564 A1	12-20-2012	Ghosh et al.

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office action dated July 15, 2015, for cross reference U.S. Patent application 13/614,197, (11 pages)

DLG PAS1367330.1-*-07/16/15 10:19 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

JEJ/dg

Electronic Patent Application Fee Transmittal

Application Number:	13872018
Filing Date:	26-Apr-2013
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Young E. Jeon/Diane Goss
Attorney Docket Number:	72827/S1437

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	22949920
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Diane Goss
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	17-JUL-2015
Filing Date:	26-APR-2013
Time Stamp:	14:22:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$180
RAM confirmation Number	596
Deposit Account	
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827ids.pdf	105758 985fa004e5584de1557c9b408d319556296 3a1c0	yes	3
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Non Patent Literature	USOA4197-15JUL2015.pdf	371075 5482256e5d97545eae86fc5dd67f6b89a2fb f2c5	no	11
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30630 e2c32d9f3a78041e632a136fcb25b4a4f00f 3ff1	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	507463		

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New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on July 17, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Kang	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT WITH FEE UNDER 37 CFR §§ 1.97(c) AND 1.17(p)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
July 17, 2015

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B listing the references that are known to applicant. A copy of the listed Other Documents reference is enclosed.

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of FORM PTO/SB/08A/B be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No. 13/872,018

The processing fee of $180.00 as required by 37 CFR § 1.17(p) is submitted herewith. The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/dg
Enclosures: Form PTO/SB/08A/B, w/references

DLG PAS1367333.1-*-07/17/15 8:16 AM

BOE
Exhibit 1027 Page 554

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

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CHRISTIE, PARKER & HALE, LLP
PO BOX 29001
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EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
06/30/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@cph.com
pair_cph@firsttofile.com

Office Action Summary	Application No. 13/872,018	Applicant(s) LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06/01/2015*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-14* is/are pending in the application.

5a) Of the above claim(s) *6* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,7-10 and 12-14* is/are rejected.

8)☒ Claim(s) *11* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☒ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *01/06/2015* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☒ 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. 13/614,197.

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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Application Status

2. This application repeats a substantial portion of prior Application No. 13/614,197, filed on 09/13/2012, and adds and claims additional disclosure not presented in the prior application. Since this application names the inventor or at least one joint inventor named in the prior application, it may constitute a continuation-in-part of the prior application. Should applicant desire to claim the benefit of the filing date of the prior application, attention is directed to 35 U.S.C. 120 and 37 CFR 1.78.

Election/Restrictions

3. Claim 6 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 06/01/2015. The traversal is on the grounds that the present application allegedly contains a reasonable number of species that would not place an undue burden on the Examiner. This is not found persuasive because the application contains a number of species that would require new separate searches, which places an undue burden on the Examiner. The requirement is still deemed proper and is therefore made FINAL.

Priority

4. Receipt is acknowledged of certified copies of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

5. Claims 7-11 and 13 are objected to because of the following informalities:

- In line 3 of claim 7 and line 3 of claim 13: "… one of the second pixel or the third pixel ..." should be changed to --... one of the second pixel and the third pixel ...--.
- In lines 3-4 of claim 7 and line 4 of claim 13: "… another of the second pixel or the third pixel ..." should be changed to --... the other of the second pixel and the third pixel ...--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-5 and 12 are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Elliot (U.S. Patent No. US 7,274,383 B1).

As to claim 1, Elliot (Figs. 1-3) teaches **a pixel arrangement structure** (an arrangement of a three-color pixel element; Fig. 1A) **of an organic light emitting diode display** (an organic light emitting diode display; col. 10, lines 24-27)**, comprising:**

- **a first pixel** (a blue emitter 12) **having a center coinciding with a center of a virtual square** (Fig. 1A)**;**

- **a second pixel** (a green emitter 16) **separated from the first pixel** (the blue emitter 12) **and having a center at a first vertex of the virtual square** (Fig. 1A)**; and**

- **a third pixel separated** (a red emitter 14) **from the first pixel** (the blue emitter 12) **and the second pixel** (the blue emitter 12) (Fig. 1A)**, and having a center at a second vertex neighboring the first vertex of the virtual square** (Fig. 1A)**,**

- **wherein the first pixel, the second pixel, and the third pixel have polygonal shapes** (Fig. 1A)**.**

As to claim 2, Elliot teaches

- **wherein the second pixel** (the green emitter 16) **comprises a pair of second pixels** (top right and bottom left green emitters 16)**, and the second pixels are separated from each other by the first pixel** (Fig. 1A)**.**

As to claim 3, Elliot teaches

- **wherein the third pixel** (the red emitter 14) **comprises a pair of third pixels** (top left and bottom right red emitters 14)**, and the third pixels are separated from each other by the first pixel** (Fig. 1A)**.**

As to claim 4, Elliot teaches

- **wherein the second pixel** (the green emitter 16) **comprises a pair of second pixels** (top right and bottom left green emitters 16)**, the third pixel** (the red emitter 14)

comprises a pair of third pixels (top left and bottom right red emitters 14) (Fig. 1A)**, and the second pixels and the third pixels enclose the first pixel in the virtual square** (Fig. 1A)**.**

As to claim 5, Elliot teaches

- **wherein each of the second pixels and the third pixels is larger in area than the first pixel** (each area of the green emitter 16 and the red emitter 14 is larger than that of the blue emitter 12) (Fig. 1A)**.**

As to claim 12, Elliot teaches

- **wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light** (the blue emitter 12, the green emitter 16, and the red emitter 14; Fig. 1A)**.**

Claim Rejections - 35 USC § 103

8. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 7, 8 and 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Elliot in view of Chao (U.S Pub. No. US 2008/0001525 A1).

As to claim 7, Elliot teaches **the pixel arrangement structure of claim 5.**

Elliot does not teach **wherein the first pixel has an octagonal shape, and one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape.**

Chao (Figs. 1b,1c, 5a, 5b and 5d) teaches

- **wherein the first pixel has an octagonal shape, and one of the second pixel or the third pixel has a hexagonal shape and another of the second pixel or the third pixel has a quadrilateral shape** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in an arrangement of color pixels of Elliot because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 8, Chao teaches

- **wherein the virtual square comprises a pair of virtual squares sharing a common side** (a line connecting subpixel R in a first row and a subpixel G in a third row in a fourth column in Fig. 5d; a virtual square can be formed by adjusting a5, b5, and c5 in Fig. 5b)**, the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares** (a subpixel G in a second

row and in a third column and a subpixel G in a second row and in a fifth column; Fig. 5d)**, and the first pixels have octagonal shapes that are symmetrical to each other** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle, circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in an arrangement of color pixels of Elliot because the arrangements of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

As to claim 14, Elliot teaches **the pixel arrangement structure of claim 5.**

Elliot does not teach **wherein the first pixel has an octagonal shape, and at least one of the second pixel and the third pixel has a hexagonal shape.**

Chao (Figs. 1b,1c, 5a, 5b and 5d) teaches

- **wherein the first pixel has an octagonal shape, and at least one of the second pixel and the third pixel has a hexagonal shape** (each of the red, green, and blue light emission zones 150, 160, and 170 may be formed in any geometrical shape, such as square, rectangle, circle, triangle, trapezoid, **polygon**, or **any combinations thereof**; [0030], lines 1-4; Figs. 1b, 1c, and 5b)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a geometrical shape for light emission zones as taught by Chao in an arrangement of color pixels of Elliot because the arrangements

of the red, green, and blue sub-pixel emission zones promise larger aperture ratios, which are necessary for prolonging the life of time of a display panel.

10. Claims 9-10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Elliot in view of Chao as applied to claim 7, and further in view of Cok (U.S Patent No. US 6,867,549 B2).

As to claim 9, Elliot and Chao teach **the pixel arrangement structure of claim 7.**

Elliot and Chao do not teach **wherein each of the second pixels is larger in area than each of the third pixels.**

Cok (Fig. 5) teaches

- **wherein each of the second pixels** (the green light emitting element 14) **is larger in area than each of the third pixels** (the red light emitting element 12) (Fig. 5)**.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced an arrangement of a three-color pixel element as taught by Cok for an arrangement of Elliot as modified by Chao because the pixel size of the blue component relative to the red or green may be larger to cause the pixel elements to age at a common rate.

As to claim 10, Elliot teaches

- **wherein a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length** (a distance between the center of blue emitter 22 and the center of green emitter 26, and a

distance between the center of blue emitter 22 and the center of red emitter 24 are a same length; Fig. 1B).

11. Claim 13 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Elliot in view of Kim (U.S Pub. No. US 2011/0012820 A1).

As to claim 13, Elliot teaches **the pixel arrangement structure of claim 12.**

Elliot does not teach **wherein the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and another of the second pixel or the third pixel is configured to emit red light.**

Kim (Figs. 1, 2 and 4) teaches

- **wherein the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and another of the second pixel or the third pixel is configured to emit red light.**

(a first sub-pixels G 12, a second sub-pixels B 14, a third sub-pixels R 16; Figs. 1, 2 and 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have exchange blue pixels and green pixels as taught by Kim in a pixel arrangement of Elliot because the exchange of pixels may be changed based on the factors, for example, the life of materials respectively utilized in each color sub-pixel for balancing the lives of sub-pixels.

Allowable Subject Matter

12. Claim 11 is objected to as being dependent upon a rejected base claim, but would be

allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

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

- Park (U.S. Pub. No. US 2012/0056531 A1) is cited to teach an OLED device having a high aperture ratio and a high resolution.
- Satou (U.S. Pub. No. US 2010/0171440 A1) is cited to teach an illuminating device comprising integrated luminance sources having a light-emitting element and a phosphor, emitting a composite light of primary lights from the luminescence sources.

Inquiry

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang-Su Yang whose telephone number is 571-270-7307. The examiner can normally be reached on Mon-Fri during 9:00am-6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. 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).

/KWANG-SU YANG/
Primary Examiner, Art Unit 2691

Notice of References Cited	Application/Control No. 13/872,018	Applicant(s)/Patent Under Reexamination LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,274,383 B1	09-2007	Elliot et al.	345/694
*	B	US-2008/0001525 A1	01-2008	Chao et al.	313/500
*	C	US-6,867,549 B2	03-2005	Cok et al.	315/169.3
*	D	US-2011/0012820 A1	01-2011	Kim et al.	345/82
*	E	US-2012/0056531 A1	03-2012	PARK et al.	313/506
*	F	US-2010/0171440 A1	07-2010	Satou et al.	315/294
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	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.

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2008/0001525 A1	01-03-2008	Chao et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		Extended European Search Report dated December 20, 2013, for corresponding European Patent Application No. 13178648.5 (9 pages)

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EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	06/23/2015

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FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)		
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	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		6,867,549 B2	03-15-2005	Cok et al.
		7,274,383 B1	09-25-2007	Brown Elliot

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office action dated March 12, 2015, for cross reference U.S. Patent application 13/614,197, (13 pages)

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FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/P849
	Application Number	To Be Determined
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	To Be Determined
	Examiner Name	To Be Determined

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FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		KR 10-0807524 B1	02-26-2008	Choo et al.	Korean Patent Abstracts for KR 10-2003-0031207 A
		KR 10-2009-0017910 A	02-19-2009	Park et al.	Korean Patent Abstracts
		KR 10-2011-0023996 A	03-09-2011	Kim et al.	Korean Patent Abstracts
		KR 10-2011-0106565 A	09-29-2011	Kim et al.	Korean Patent Abstracts
		KR 10-2012-0022967 A	03-12-2012	Nakano et al.	Korean Patent Abstracts

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		Korean Patent Abstracts of Korean Publication No. 10-2003-0031207 A, published April 21, 2003, which corresponds to KR 10-0807524 B1, 2 pages

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	Examiner Name	Kwang-Su Yang

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		KR 10-0742370 B1	07-24-2007	Kang et al.	*Korean Patent Abstracts

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		*Korean Patent Abstracts for Korean Publication 1020070055908 dated May 31, 2007, corresponding to Korean Patent 10-0742370 dated July 24, 2007, listed above.

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EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	06/23/2015

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FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		6,366,025 B1	04-02-2002	Yamada
		2005/0162079 A1	07-28-2005	Sakamoto
		2010/0033084 A1	02-11-2010	Ko et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		SIPO Office action dated March 11, 2015, corresponding to Chinese Patent application 201310035429.X, (7 pages)
		Taiwan Office action dated March 30, 2015, corresponding to Taiwanese Patent application 102101000, (7 pages)

DLG PAS1358073.1-*-05/21/15 10:33 AM

EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	06/23/2015

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

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	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2012/0313844 A1	12-13-2012	Im et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2004-192813	07-08-2004	Yamashita	Patent Abstracts of Japan
		JP 2011-076760	04-14-2011	Enkai et al.	Patent Abstracts of Japan
		WO 2005/067352 A1	07-21-2005	Chung et al.	

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		EPO Search Report dated July 9, 2014, for European Patent application 14155124.2, (8 pages)

DLG PAS1313566.1-*-08/18/14 8:19 AM

EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	06/23/2015

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FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2677
	Examiner Name	To be determined

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2002/0015110 A1	02-07-2002	Brown Elliott
		2002/0070909 A1	06-13-2002	Asano et al.
		2004/0108818 A1	06-10-2004	Cok et al.
		2005/0001542 A1	01-06-2005	Kiguchi

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		GB 2 437 110 A	10-17-2007	Smith et al.	Patent Abstracts of Japan
		JP 2000-235891	08-29-2000	Fujimori et al.	Patent Abstracts of Japan
		JP 2006-309182	11-09-2006	Koyama et al.	Patent Abstracts of Japan
		JP 2008-015521	01-24-2008	Chao et al.	Patent Abstracts of Japan

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		EPO Search Report dated July 8, 2013, for corresponding European Patent application 13157562.3, (6 pages)

DLG PAS1254998.1-*-08/30/13 11:00 AM

EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	06/23/2015

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FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2002/0113195 A1	08-22-2002	Osada
		2009/0302331 A1	12-10-2009	Smith et al.
		2010/0171440 A1	07-08-2010	Satou et al.
		2011/0012820 A1	01-20-2011	Kim et al.
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FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office action dated November 7, 2014, for cross reference U.S. Patent application 13/614,197, (16 pages)
		U.S. Office action dated August 29, 2014, for cross reference U.S. Patent application 14/059,356, (18 pages)

DLG PAS1328199.1-*-11/19/14 8:37 AM

EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	06/23/2015

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

CPC- SEARCHED		
Symbol	Date	Examiner
G09G3/3208 H01L27/3216 H01L27/3218	06/23/2015	KY

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST: Inventor Search and Assignee Search	06/23/2015	KY
EAST: Text Search	06/23/2015; 06/24/2015	KY

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

	/KWANG-SU YANG/ Primary Examiner.Art Unit 2691

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13872018	LEE, SANG-SHIN
	Examiner	Art Unit
	KWANG-SU YANG	2691

✓	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	06/24/2015								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	N								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	O								
	12	✓								
	13	✓								
	14	✓								

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2621
	Examiner Name	Amr A. Awad

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		8,350,468 B2	01-08-2013	Ko et al.

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

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EXAMINER SIGNATURE	/Kwang-Su Yang/	DATE CONSIDERED	06/23/2015

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CONFIRMATION NO. 4833

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/872,018	04/26/2013	345	2691	72827/S1437

APPLICANTS
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INVENTORS
Sang-Shin Lee, Yongin-City, KOREA, REPUBLIC OF;

**** CONTINUING DATA ***************************
This application is a CIP of 13/614,197 09/13/2012

**** FOREIGN APPLICATIONS ***************************
REPUBLIC OF KOREA 10-2012-0022967 03/06/2013
REPUBLIC OF KOREA 10-2013-0044993 04/23/2013

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
05/28/2013

Foreign Priority claimed ☑ Yes ☐ No 35 USC 119(a-d) conditions met ☑ Yes ☐ No Verified and Acknowledged /KWANG-SU YANG/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		KOREA, REPUBLIC OF	1	13	1

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PO BOX 29001
Glendale, CA 91209-9001
UNITED STATES

TITLE
PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

FILING FEE RECEIVED		
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	"13872018"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/06/23 14:43
S2	7	("20080001525" "20020015110").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/06/23 15:07
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S4	2	"8350468".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/06/23 15:42
S5	9	("20090302331" "20090302331" "20100033084" "201100128201" "20020113195" "20100171440").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/06/23 15:47
S6	4	("6366025" "20050162079").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/06/23 15:49
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		"20050067352" "20080001525" "20110076760" "20100033084").pn.	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			16:01
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S20	8	(pixel sub$1pixel) and octagon$2 and hexagon$2 and virtual adj square	US-PGPUB; USPAT; USOCR	OR	ON	2015/06/23 18:41
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S23	23	(US-20080001525-$ or US-20020015110-$ or US-20100171440-$ or US-20090302331-$ or US-20020113195-$ or US-20130037827-$ or US-20120086330-$ or US-20110012820-$ or US-20120313844-$ or US-20100033084-$ or US-20050001542-$ or US-20040108818-$ or US-20020070909-$ or US-20140071030-$ or US-20130234917-$ or US-20050248262-$ or US-20140319484-$ or US-20140319479-$ or US-20120292521-$ or US-20120056531-$ or US-20090109172-$).did. or (US-7274383-$ or US-6867549-$).did.	US-PGPUB; USPAT	OR	ON	2015/06/23 20:33
S24	14	S23 and hexagon$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/06/23 20:33
S25	3	"20110012820".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/06/24 16:46

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Signature

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	
Customer No.	: 23363	

AMENDMENT IN RESPONSE TO NOTICE OF NON-COMPLIANT AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
June 1, 2015

Commissioner:

In response to the Notice of Non-Compliant Amendment of March 31, 2015 (hereinafter "the Notice"), please amend the above-identified application as follows:

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Amendments to the Drawings begin on page 5 of this paper and include an attached replacement sheet.

Remarks/Arguments begin on page 6 of this paper.

An **Appendix** including a replacement drawing sheet is attached following page 6 of this paper.

BOE
Exhibit 1027 Page 584

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A pixel arrangement structure of an organic light emitting diode display, comprising:

a first pixel having a center coinciding with a center of a virtual square;

a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and

a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square,

wherein the first pixel, the second pixel, and the third pixel have polygonal shapes.

2. (Original) The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels, and

the second pixels are separated from each other by the first pixel.

3. (Original) The pixel arrangement structure of claim 1, wherein

the third pixel comprises a pair of third pixels, and

the third pixels are separated from each other by the first pixel.

4. (Original) The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels,

the third pixel comprises a pair of third pixels, and

the second pixels and the third pixels enclose the first pixel in the virtual square.

5. (Original) The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

6. (Withdrawn) The pixel arrangement structure of claim 5, wherein

the first pixel has an octagonal shape, and

at least one of the second pixel or the third pixel has an octagonal shape.

7. (Currently amended) The pixel arrangement structure of claim 5, wherein

the first pixel has an octagonal shape, and

one of the second pixel or the third pixel has a hexagonal shape and ~~an other~~ another of the second pixel or the third pixel has a quadrilateral shape.

8. (Original) The pixel arrangement structure of claim 7, wherein

the virtual square comprises a pair of virtual squares sharing a common side,

the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares, and

the first pixels have octagonal shapes that are symmetrical to each other.

9. (Original) The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. (Original) The pixel arrangement structure of claim 9, wherein a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length.

11. (Original) The pixel arrangement structure of claim 10, wherein

the virtual square comprises a pair of virtual squares sharing a common side,

the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares,

a distance between each of the second pixels and the third pixels is a same second length, and

a distance between the first pixels is a third length that is longer than the first length and the second length.

12. (Original) The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. (Currently amended) The pixel arrangement structure of claim 12, wherein
the first pixel is configured to emit green light,
one of the second pixel or the third pixel is configured to emit blue light, and
~~an other~~ another of the second pixel or the third pixel is configured to emit red light.

14. (Previously presented) The pixel arrangement structure of claim 5, wherein
the first pixel has an octagonal shape, and
at least one of the second pixel and the third pixel has a hexagonal shape.

Amendments to the Drawings:

Please replace the sheet of drawings including FIG. 6 of the substitute drawings filed on January 6, 2015 with the following amended sheet, which includes changes to FIG. 6 (specifically, the legend "FIG. 6" has been re-oriented to be consistent with the orientation of the remainder of the drawing).

Attachment: Replacement Sheet

BOE
Exhibit 1027 Page 588

REMARKS/ARGUMENTS

Claims 1–14 are pending in the present application, of which claim 1 is independent. Claim 6 is withdrawn herein as required by the Notice. FIG. 6 is amended to re-orient the legend "FIG. 6" to be consistent with the orientation of the rest of the drawing. Claims 7 and 13 are amended herein. The Applicant respectfully requests examination on the merits and allowance of claims 1–5 and 7–14 and, upon allowance of claims 1 and 4–5 (from which claim 6 depends), rejoinder and allowance of withdrawn claim 6.

In response to the Notice, the Applicant acknowledges the apparent determination by the Notice that the Applicant's provisional election of claims 1–5 and 7–14 with traverse on January 6, 2015 has been made final, and that the Notice appears to have thus changed the status of claim 6 from original to withdrawn. Accordingly, claim 6 is amended herein to be consistent with this determination. The Applicant reserves the right to pursue withdrawn claim 6 in a divisional application. In addition, the Applicant respectfully notes that withdrawn claim 6 is a dependent claim from elected (and non-withdrawn) claims 1 and 4–5, and requests rejoinder with the elected claims should the elected claims become allowable during the prosecution of the present application.

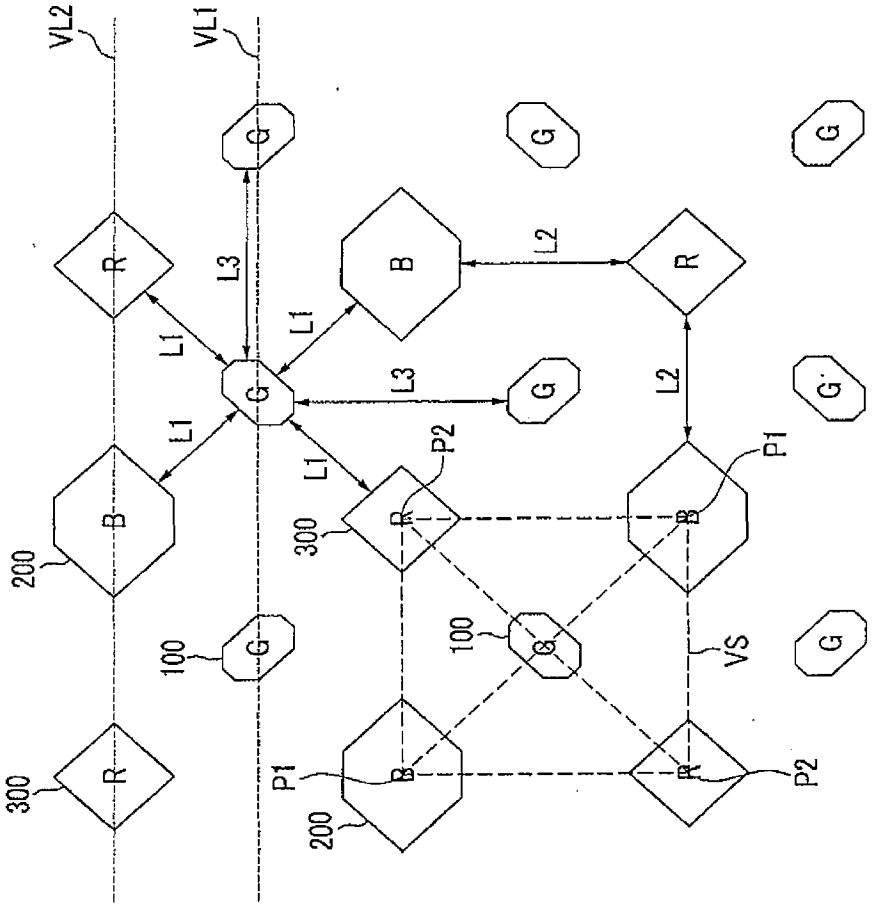
In view of the foregoing amendments and remarks, the Applicant respectfully requests a Notice of Allowance for claims 1–14. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call the Applicant's attorney at the number listed below.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By Bruce A. Wagar
Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/baw
NSS PAS1334516.2-*-06/1/15 6:23 PM

FIG. 6


VL2
VL1
G
G
G
R
L3
B
L2
R
L1
L1
G
L3
G
L2
G
L1
L1
P2
P1
B
200
300
R
B
100
G
100
G
VS
G
300
R
P1
B
R
P2
200

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
AMENDMENT TRANSMITTAL LETTER

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on June 1, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Signature

Inventor : Sang-Shin Lee Confirmation No. 4833
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : 2691
Examiner : Kwang-Su Yang

Docket No. : 72827/S1437

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
June 1, 2015

Commissioner:

Enclosed is an amendment to the above-identified application.

CLAIMS AS AMENDED							
	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra Claims	Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Total Claims	14 -	* 20	= 0	0 x $80.00	$40.00	$20.00	$0.00
Independent Claims	1 -	** 3	= 0	0 x $420.00	$210.00	$105.00	$0.00
Multiple Dependent Claims***				$780.00	$390.00	$195.00	$0.00
						Total Additional Fee	$0.00
List Independent Claims: 1							

* If the "Highest Number of Total Claims Previously Paid For" is less than 20, enter "20" in this space
** If the "Highest Number of Independent Claims Previously Paid For" is less than 3, enter "3" in this space
*** Pay this fee only when "Multiple Dependent Claims" are added for the first time

__X__ No additional fee is required.
_____ A Petition for Extension of Time and the required fee are enclosed.

__X__ Other enclosures: Replacement Fig. 6

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by or to give effect to this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

CHRISTIE, PARKER & HALE, LLP

By Bruce A. Wagar

Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/mac

NSS PAS1359384.1-*-06/1/15 6:17 PM

Electronic Acknowledgement Receipt

EFS ID:	22504238
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Bruce A. Wagar/Marti Carrillo
Filer Authorized By:	Bruce A. Wagar
Attorney Docket Number:	72827/S1437
Receipt Date:	01-JUN-2015
Filing Date:	26-APR-2013
Time Stamp:	22:57:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_Resp-Non-Compliant-Amend.PDF	135854 ee856d95ba3df8589e7fca6db819ca8980699258	yes	7

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	4
	Drawings-other than black and white line drawings	5	5
	Applicant Arguments/Remarks Made in an Amendment	6	6
	Drawings-only black and white line drawings	7	7

Warnings:					
Information:					
2	Transmittal Letter	72827_Transmittal.PDF	35332 3d329c6fB1cc46dd52c8c1045a624fddb192e9b9	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	171186		

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New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

DocCode – SCORE

SCORE Placeholder Sheet for IFW Content

Application Number: 13872018 Document Date: 06/01/2015

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

- Drawing

At the time of document entry (noted above):

- USPTO employees may access SCORE content via eDAN using the Supplemental Content tab, or via the SCORE web page.
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Form Revision Date: August 26, 2013

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/872,018	Filing Date 04/26/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT

06/01/2015	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					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 number found in the appropriate box in column 1.

LIE
/VENICE WILLIAMS/

This collection of information is required by 37 CFR 1.16. 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, 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.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		6,366,025 B1	04-02-2002	Yamada
		2005/0162079 A1	07-28-2005	Sakamoto
		2010/0033084 A1	02-11-2010	Ko et al.

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		SIPO Office action dated March 11, 2015, corresponding to Chinese Patent application 201310035429.X, (7 pages)
		Taiwan Office action dated March 30, 2015, corresponding to Taiwanese Patent application 102101000, (7 pages)

DLG PAS1358073.1-*-05/21/15 10:33 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

JEJ/dg

BOE
Exhibit 1027 Page 597

Electronic Acknowledgement Receipt

EFS ID:	22417205
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Young E. Jeon/Diane Goss
Filer Authorized By:	Jun-Young E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	21-MAY-2015
Filing Date:	26-APR-2013
Time Stamp:	16:13:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827ids.pdf	110173 119bd7d5be8bff9722f816e8c8f085646ec206b1	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3

Warnings:					
Information:					
2	Non Patent Literature	CN_OfficeAction.pdf	221618 1deeba2a024cd76d95aa13eb58b7cc82763a9e45	no	7
Warnings:					
Information:					
3	Non Patent Literature	TW_OfficeAction.pdf	180539 ea68d98883a62ce5de5ce271bdb76f51bc62c0eb	no	7
Warnings:					
Information:					
		Total Files Size (in bytes):	512330		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on May 21, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
May 21, 2015

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B listing the references that are known to applicant. Copies of each of the listed Other Documents references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of FORM PTO/SB/08A/B be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/dg
Enclosures: PTO/SB/08A/B, w/references

DLG PAS1358074.1-*-05/21/15 10:39 AM

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE** **STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		6,867,549 B2	03-15-2005	Cok et al.
		7,274,383 B1	09-25-2007	Brown Elliot

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office action dated March 12, 2015, for cross reference U.S. Patent application 13/614,197, (13 pages)

DLG PAS1347241.1-*-04/9/15 8:07 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

PCH/dg

Electronic Acknowledgement Receipt

EFS ID:	22015882
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Youg E. Jeon/Diane Goss
Filer Authorized By:	Jun-Youg E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	09-APR-2015
Filing Date:	26-APR-2013
Time Stamp:	14:28:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827ids.pdf	106131 2c91b5fb3e7da80be95dc20e21ab2a26103fc9dd	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3

Warnings:					
Information:					
2	Non Patent Literature	USOA4197-12MAR2015.pdf	424393 847f941b9f0dcd9028531c13f35ab007c56ae48c	no	13
Warnings:					
Information:					
		Total Files Size (in bytes):	530524		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on April 9, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
April 9, 2015

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B listing the references that are known to applicant. A copy of the listed Other Documents reference is enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of FORM PTO/SB/08A/B be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/dg
Enclosures: PTO/SB/08A/B, w/references

DLG PAS1347272.1-*-04/9/15 8:08 AM

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Exhibit 1027 Page 606

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 03/31/2015
CHRISTIE, PARKER & HALE, LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER
YANG, KWANG-SU

ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
03/31/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@cph.com
pair_cph@firsttofile.com

Notice of Non-Compliant Amendment (37 CFR 1.121)	Application No. 13/872,018	Applicant(s) LEE, SANG-SHIN
	Examiner KWANG-SU YANG	Art Unit 2691

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

The amendment document filed on *06 January 2015* is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121 or 1.4. In order for the amendment document to be compliant, correction of the following item(s) is required.

THE FOLLOWING MARKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

- ☐ 1. Amendments to the specification:
  - ☐ A. Amended paragraph(s) do not include markings.
  - ☐ B. New paragraph(s) should not be underlined.
  - ☐ C. Other _____.
- ☐ 2. Abstract:
  - ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
  - ☐ B. Other _____.
- ☐ 3. Amendments to the drawings:
  - ☐ A. The drawings are not properly identified in the top margin as "Replacement Sheet," "New Sheet," or "Annotated Sheet" as required by 37 CFR 1.121(d).
  - ☐ B. The practice of submitting proposed drawing correction has been eliminated. Replacement drawings showing amended figures, without markings, in compliance with 37 CFR 1.84 are required.
  - ☐ C. Other _____.
- ☒ 4. Amendments to the claims:
  - ☐ A. A complete listing of all of the claims is not present.
  - ☐ B. The listing of claims does not include the text of all pending claims (including withdrawn claims)
  - ☐ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified. Note: the status of every claim must be indicated after its claim number by using one of the following status identifiers: (Original), (Currently amended), (Canceled), (Previously presented), (New), (Not entered), (Withdrawn) and (Withdrawn-currently amended).
  - ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
  - ☒ E. Other: *Status identifier (Original) in claim 6 is not consistent with a statement in the amendment (page 9, lines 1-2), that is, "elects Species F with traverse, including claims 1-5 and 7-14"*.
- ☐ 5. Other (e.g., the amendment is unsigned or not signed in accordance with 37 CFR 1.4):

_____

For further explanation of the amendment format required by 37 CFR 1.121, see MPEP § 714.

TIME PERIODS FOR FILING A REPLY TO THIS NOTICE:

1. Applicant is given **no new time period** if the non-compliant amendment is an after-final amendment or an amendment filed after allowance. If applicant wishes to resubmit the non-compliant after-final amendment with corrections, the **entire corrected amendment** must be resubmitted.
2. Applicant is given **two months** from the mail date of this notice to supply the correction, if the non-compliant amendment is one of the following: a preliminary amendment, a non-final amendment (including a submission for a request for continued examination (RCE) under 37 CFR 1.114), a supplemental amendment filed within a suspension period under 37 CFR 1.103(a) or (c), and an amendment filed in response to a *Quayle* action. If any of above boxes 1. to 4. are checked, the correction required is only the **corrected section** of the non-compliant amendment in compliance with 37 CFR 1.121.

   Extensions of time are available under 37 CFR 1.136(a) only if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action.

   Failure to timely respond to this notice will result in:
   Abandonment of the application if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action; or
   Non-entry of the amendment if the non-compliant amendment is a preliminary amendment or supplemental amendment.

/KWANG-SU YANG/ Primary Examiner, Art Unit 2691	

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on January 5, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Nathalie Shereston

Appl No.	: 13/872,018	Confirmation No. 4833
Inventor	: Sang-Shin Lee	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
TC/A.U.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	
Customer No.	: 23363	

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
January 5, 2015

Commissioner:

In response to the Office action of November 5, 2014 (hereinafter "the Restriction"), please amend the above-identified application as follows:

Amendments to the Specification begin on page 3 of this paper and include an attached substitute specification.

Amendments to the Claims are reflected in the listing of claims, which begins on page 4 of this paper.

Amendments to the Drawings begin on page 7 of this paper and include an attached set of substitute drawings.

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Remarks/Arguments begin on page 8 of this paper.

An **Appendix** including a substitute specification and set of drawings is attached following page 9 of this paper.

BOE
Exhibit 1027 Page 611

Amendments to the Specification:

Please replace the specification as filed with the substitute specification provided herein.

Attachment: Substitute Specification
Annotated Specification Showing Changes

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Original) A pixel arrangement structure of an organic light emitting diode display, comprising:

a first pixel having a center coinciding with a center of a virtual square;

a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and

a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square,

wherein the first pixel, the second pixel, and the third pixel have polygonal shapes.

2. (Original) The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels, and

the second pixels are separated from each other by the first pixel.

3. (Original) The pixel arrangement structure of claim 1, wherein

the third pixel comprises a pair of third pixels, and

the third pixels are separated from each other by the first pixel.

4. (Original) The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels,

the third pixel comprises a pair of third pixels, and

the second pixels and the third pixels enclose the first pixel in the virtual square.

5. (Original) The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

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6. (Original) The pixel arrangement structure of claim 5, wherein

the first pixel has an octagonal shape, and

at least one of the second pixel or the third pixel has an octagonal shape.

7. (Original) The pixel arrangement structure of claim 5, wherein

the first pixel has an octagonal shape, and

one of the second pixel or the third pixel has a hexagonal shape and an other of the second pixel or the third pixel has a quadrilateral shape.

8. (Original) The pixel arrangement structure of claim 7, wherein

the virtual square comprises a pair of virtual squares sharing a common side,

the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares, and

the first pixels have octagonal shapes that are symmetrical to each other.

9. (Original) The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. (Original) The pixel arrangement structure of claim 9, wherein a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length.

11. (Original) The pixel arrangement structure of claim 10, wherein

the virtual square comprises a pair of virtual squares sharing a common side,

the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares,

a distance between each of the second pixels and the third pixels is a same second length, and

a distance between the first pixels is a third length that is longer than the first length and the second length.

12. (Original) The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. (Original) The pixel arrangement structure of claim 12, wherein
the first pixel is configured to emit green light,
one of the second pixel or the third pixel is configured to emit blue light, and
an other of the second pixel or the third pixel is configured to emit red light.

14. (New) The pixel arrangement structure of claim 5, wherein
the first pixel has an octagonal shape, and
at least one of the second pixel and the third pixel has a hexagonal shape.

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Amendments to the Drawings:

Please replace the drawing as filed with the substitute set of drawings provided herein. The drawing as filed is amended to incorporate the legend "FIG. 6" while FIGs. 1–5 are provided as filed in the parent application (U.S. Appl. No. 13/614,197, hereinafter "the Parent Application").

Attachment: Substitute Drawings

BOE
Exhibit 1027 Page 616

REMARKS/ARGUMENTS

Claims 1–14 are pending in the present application, of which claim 1 is independent. The specification and drawings are amended herein to incorporate the material of the Parent Application as required by the Restriction. Claim 14 is new and finds support in at least FIG. 6 of the application as amended herein. The Applicant respectfully requests examination on the merits and allowance of claims 1–14.

In response to the Restriction, the Applicant hereby provisionally elects Species F (FIG. 6 as renumbered herein) with traverse, including claims 1–5 and 7–14. The Applicant does not believe it would be unduly burdensome for the Examiner to also search for embodiments of Species A–E or claim 6. The drawings provided in the present application and the Parent Application illustrate example embodiments of the present application, and are not intended to delineate the claims into separately searchable embodiments.

For example, claim 6 does not appear to correspond exactly to any of the illustrated embodiments, but is nonetheless comprised of features illustrated in the drawings as a group. Further, Species A-E appear to be indistinguishable based on their corresponding claims. Accordingly, it does not appear that it would unduly burden the Examiner to search embodiments of all of the different Species.

The traversal of the Restriction and the remarks regarding the traversal are being submitted without prejudice. Neither the traversal of the Restriction , nor the remarks regarding the traversal shall be interpreted as disputing the Examiner's finding that Species A–F are patentably distinct. Nevertheless, patentably distinct species notwithstanding, the differences between Species A–F do not appear to unduly burden the Examiner to search for embodiments of these six species.

Additionally, the Applicant expects the Examiner to use a consistent test with respect to what matters are obvious and what matters are unobvious throughout the prosecution of this application. Because the Examiner is adopting a particular standard for patentability in this case, in terms of the Restriction, the Applicant will expect that the same test be used throughout the prosecution of this application if the Examiner does not withdraw the Restriction.

In summary, the Applicant hereby provisionally elects Species F with traverse, including claims 1–5 and 7–14, for the reasons stated above. In addition, the Applicant reserves the right to file a divisional application with any claims that are withdrawn from the present application. If there are any remaining issues that can be addressed over the telephone, the Examiner is cordially invited to call the Applicant's attorney at the number listed below.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By Bruce A. Wagar
Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/baw

NSS PAS1334516.1-*-01/5/15 6:04 PM

FIG.1

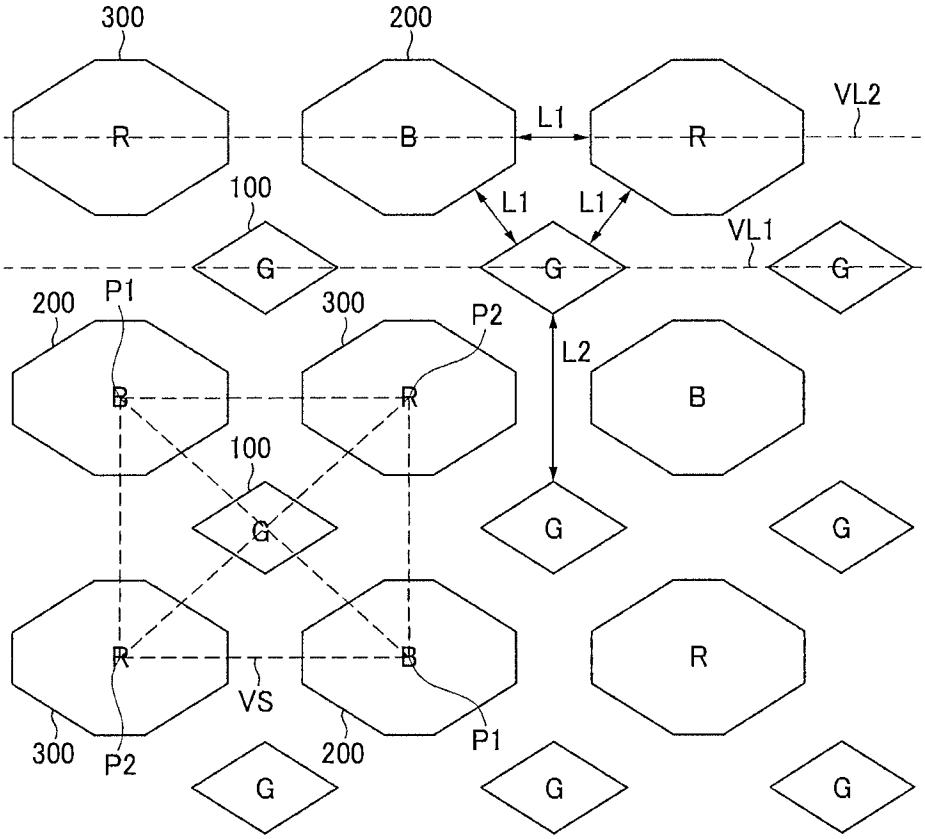

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200
R
B
L1
R
VL2
100
L1
L1
VL1
G
G
G
200
P1
300
P2
L2
B
R
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G
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R
B
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VS
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P2
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P1
G
G
G

FIG.2

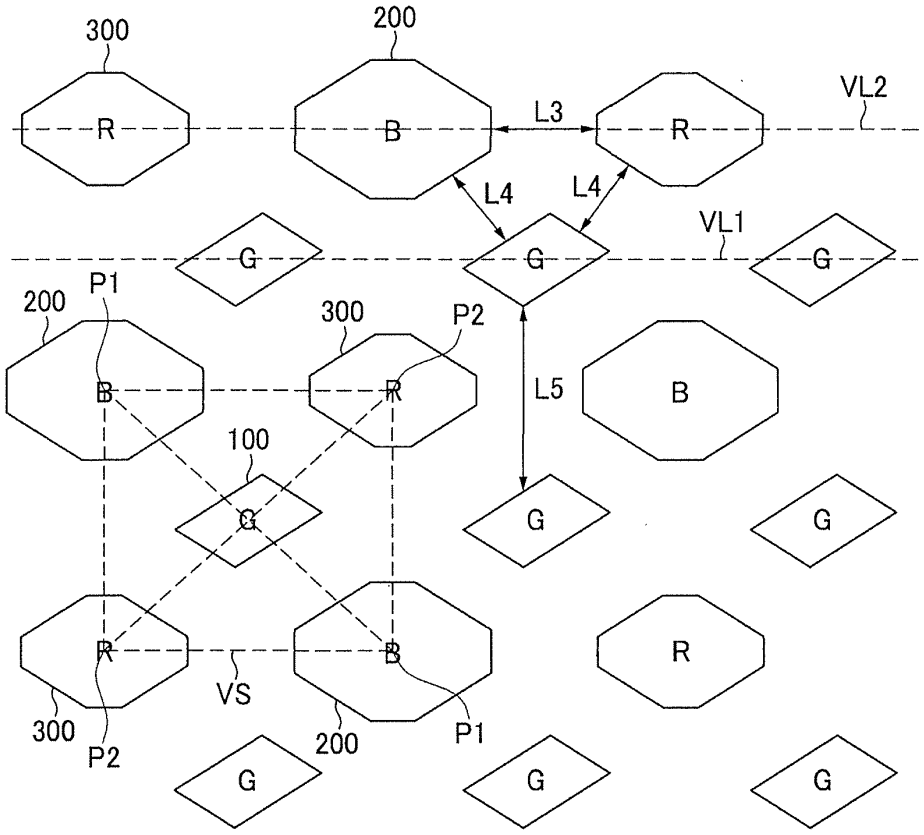

300
200
VL2
R
B
L3
R
L4
L4
VL1
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G
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P1
200
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P2
B
R
L5
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R
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P1
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G
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FIG.3

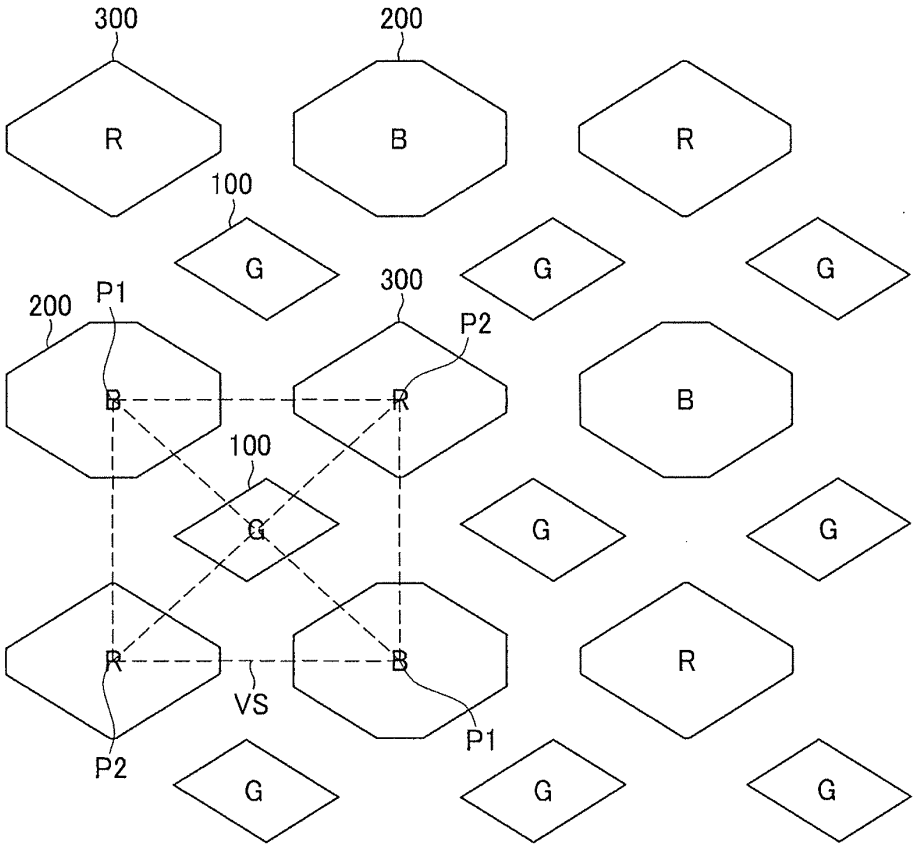


FIG.4

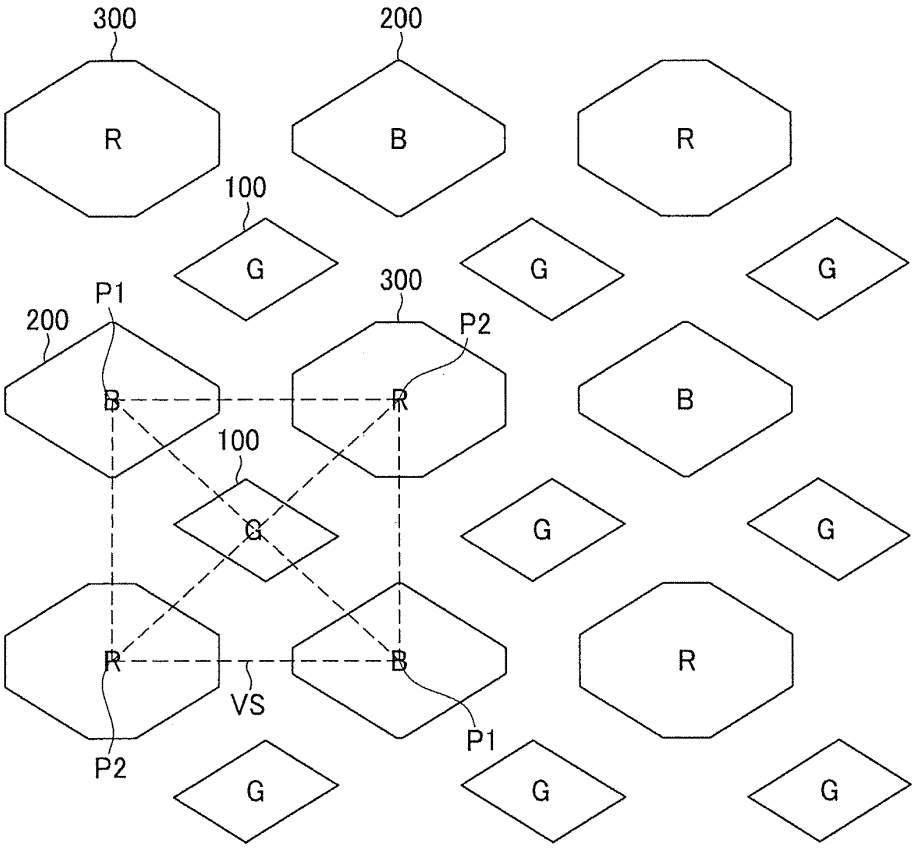


FIG.5

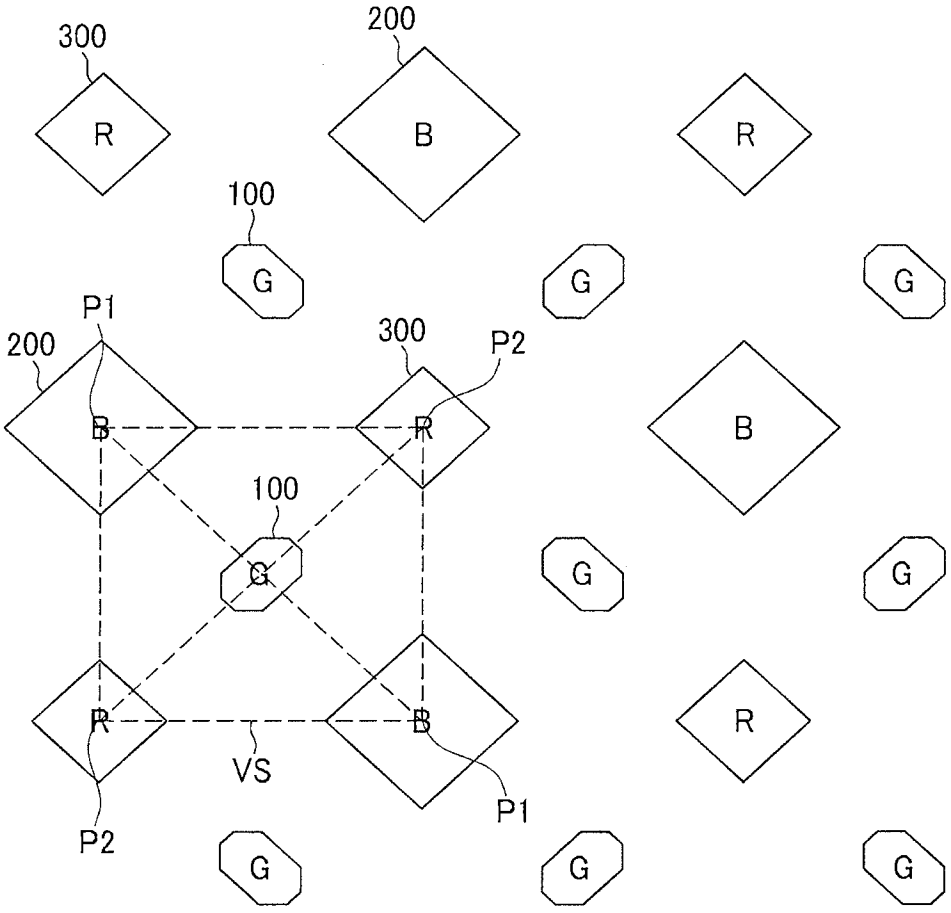
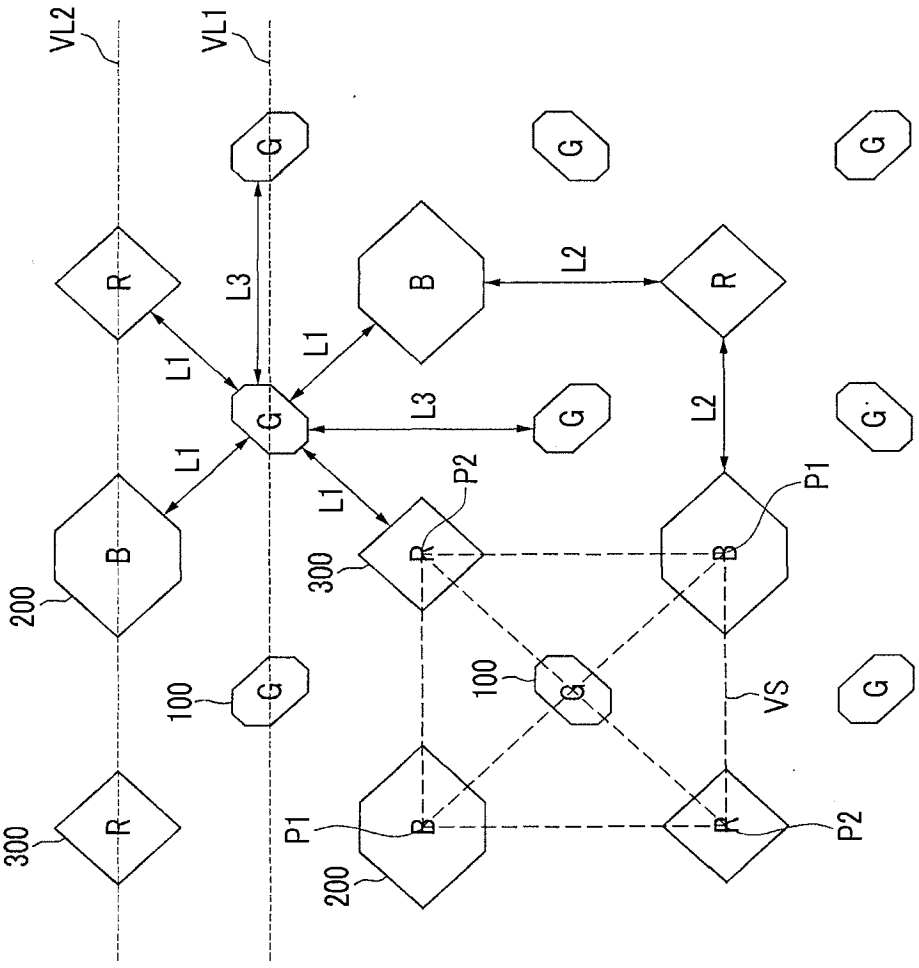


FIG. 6



PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation in part of U.S. Application No. 13/614,197, filed September 13, 2012, which claims priority to and the benefit of Korean Patent Application No. 10-2012-0022967, filed in the Korean Intellectual Property Office on March 6, 2012. This application also claims priority to and the benefit of Korean Patent Application No. 10-2013-0044993, filed in the Korean Intellectual Property Office on April 23, 2013. The entire contents of all of these are incorporated herein by reference.

BACKGROUND

1. Field

[0002] Aspects of embodiments of the present invention relate generally to a pixel arrangement structure for an organic light emitting diode (OLED) display.

2. Description of the Related Art

[0003] A display device is a device that displays an image. Recently, an OLED display has been drawing attention.

[0004] The OLED display has a self-luminous characteristic. Because the OLED display does not need a separate light source, unlike a liquid crystal display, it can have a relatively smaller thickness and weight than liquid crystal displays. In addition, the OLED display exhibits high-quality characteristics such as low power consumption, high luminance, high response speed, etc.

[0005] In general, the OLED display includes a plurality of pixels for emitting light of different colors. The plurality of pixels emit light to display an image.

[0006] Here, the pixel refers to a minimum unit for displaying the images. For instance, there may be a gate line, a data line, and a power line such as a driving power line to drive each pixel. In addition, there may be an insulation layer such as a pixel definition layer to define an area and a shape of each pixel. Further, each pixel may be positioned between its neighboring pixels.

[0007] An organic emission layer included in the pixel of an OLED display may be deposited and formed by using a mask such as a fine metal mask (FMM). When reducing a gap between the neighboring pixels to obtain a high aperture ratio of the pixels, deposition reliability may be deteriorated. On the other hand, when increasing the gap between the pixels to improve the deposition reliability, the aperture ratio of the pixels may be deteriorated.

[0008] The above information disclosed in this Background section is only for enhancement of understanding of the background of the invention and therefore it may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

SUMMARY

[0009] Aspects of embodiments of the present invention relate generally to a pixel arrangement structure for an OLED display. More particularly, aspects of embodiments of the present invention relate to a pixel arrangement structure of an OLED display that displays an image by emitting light through a plurality of pixels.

[0010] An exemplary embodiment of the present invention provides a pixel arrangement structure for an OLED display having an improved aperture ratio of each of the pixels while efficiently setting up gaps between the pixels.

[0011] According to an exemplary embodiment of the present invention, a pixel arrangement structure of an organic light emitting diode display is provided. The pixel arrangement structure includes: a first pixel having a center coinciding with a center of a

virtual square; a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square.

[0012] The second pixel may include a pair of second pixels. The second pixels may be separated from each other by the first pixel.

[0013] The third pixel may include a pair of third pixels. The third pixels may be separated from each other by the first pixel.

[0014] The second pixels and the third pixels may enclose the first pixel in the virtual square.

[0015] The first pixel, the second pixels, and the third pixels may have polygonal shapes. The second pixels and the third pixels may have a larger area than the first pixel.

[0016] The first pixel may have a quadrilateral shape. The second pixels and the third pixels may have hexagonal or octagonal shapes.

[0017] The second pixels and the third pixels may have octagonal shapes.

[0018] The second pixels and the third pixels may have a same area. A distance between the first pixel and the second pixels, a distance between the first pixel and the third pixels, and a distance between the second pixels and the third pixels may be a same first length.

[0019] The first pixel may include a plurality of first pixels. The plurality of first pixels may have a same quadrilateral shape. A distance between neighboring ones of the plurality of first pixels may be a second length that is longer than the first length.

[0020] The second pixels may have a larger area than the third pixels. A distance between the second pixels and the third pixels may be a first length. A distance between the first pixel and the second pixels, and a distance between the first pixel and the third pixels may be a same second length.

[0021] The first pixel may include a plurality of first pixels. The plurality of first pixels may have a same quadrilateral shape. A distance between neighboring ones of the plurality of first pixels may be a third length that is longer than the first length and the second length.

[0022] The first pixel may include a plurality of first pixels. Neighboring ones of the plurality of first pixels may have quadrilateral shapes that are symmetrical to each other. A distance between the neighboring ones of the plurality of first pixels may be a third length that is longer than the first length and the second length.

[0023] The first pixel may include a plurality of first pixels. Neighboring ones of the plurality of first pixels may have quadrilateral shapes that are symmetrical to each other.

[0024] The second pixels may have a larger area than the third pixels.

[0025] The third pixels may have a larger area than the second pixels.

[0026] The first pixel, the second pixel, and the third pixel may be configured to emit different color lights.

[0027] The first pixel, the second pixel, and the third pixel may be configured to emit green light, blue light, and red light, respectively.

~~[0011]~~[0028] According to an exemplary embodiment of the present invention, a pixel arrangement structure of an organic light emitting diode (OLED) display is provided. The pixel arrangement structure includes: a first pixel having a center coinciding with a center of a virtual square; a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square. The first pixel, the second pixel, and the third pixel have polygonal shapes.

~~[0012]~~[0029] In one embodiment, the second pixel includes a pair of second pixels, and the second pixels are separated from each other by the first pixel.

~~[0013]~~[0030] In one embodiment, the third pixel includes a pair of third pixels, and the third pixels are separated from each other by the first pixel.

~~[0014]~~[0031] In one embodiment, the second pixel includes a pair of second pixels, the third pixel includes a pair of third pixels, and the second pixels and the third pixels enclose the first pixel in the virtual square.

~~[0015]~~[0032] In one embodiment, each of the second pixels and the third pixels is larger in area than the first pixel.

~~[0016]~~[0033] In one embodiment, the first pixel has an octagonal shape, and at least one of the second pixel or the third pixel has an octagonal shape.

~~[0017]~~[0034] In one embodiment, the first pixel has an octagonal shape, and one of the second pixel or the third pixel has a hexagonal shape and an other of the second pixel or the third pixel has a quadrilateral shape.

~~[0018]~~[0035] In one embodiment, the virtual square includes a pair of virtual squares sharing a common side, the first pixel includes a pair of first pixels having centers respectively coinciding with centers of the virtual squares, and the first pixels have octagonal shapes that are symmetrical to each other.

~~[0019]~~[0036] In one embodiment, each of the second pixels is larger in area than each of the third pixels.

~~[0020]~~[0037] In one embodiment, a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length.

~~[0021]~~[0038] In one embodiment, the virtual square includes a pair of virtual squares sharing a common side, the first pixel includes a pair of first pixels having centers respectively coinciding with centers of the virtual squares, a distance between each of the second pixels and the third pixels is a same second length, and a distance between the first pixels is a third length that is longer than the first length and the second length.

[0022][0039] In one embodiment, the first pixel, the second pixel, and the third pixel are configured to emit different color light.

[0023][0040] In one embodiment, the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and an other of the second pixel or the third pixel is configured to emit red light.

[0024][0041] According to an exemplary embodiment of the present invention, the pixel arrangement structure of the OLED display improves the aperture ratio of the pixels while efficiently setting up the gaps between the pixels.

BRIEF DESCRIPTION OF THE ~~DRAWING~~DRAWINGS

[0042] ~~The drawing~~FIG. 1 is a view of a pixel arrangement structure of an OLED display according to ~~an~~a first exemplary embodiment.

[0043] FIG. 2 is a view of ~~the present invention.~~a pixel arrangement structure of an OLED display according to a second exemplary embodiment.

[0044] FIG. 3 is a view of a pixel arrangement structure of an OLED display according to a third exemplary embodiment.

[0045] FIG. 4 is a view of a pixel arrangement structure of an OLED display according to a fourth exemplary embodiment.

[0046] FIG. 5 is a view of a pixel arrangement structure of an OLED display according to a fifth exemplary embodiment.

[0025][0047] FIG. 6 is a view of a pixel arrangement structure of an OLED display according to a sixth exemplary embodiment.

DETAILED DESCRIPTION

[0026][0048] Several exemplary embodiments according to the present invention are described hereinafter in detail with reference to the accompanying drawing to allow one of ordinary skill in the art to practice the invention without undue experimentation. The

present invention can be embodied in several different forms, and is not limited to the exemplary embodiments that are described herein.

~~[0027]~~[0049] In order to clarify the description of embodiments of the present invention, parts that are not related to the invention may be omitted. In addition, the same elements or equivalents are referred to with the same reference numerals throughout the specification.

~~[0028]~~[0050] Further, since sizes and thicknesses of constituent members shown in the accompanying drawing may be arbitrarily given for better understanding and ease of description, the present invention is not limited to the illustrated sizes and thicknesses.

~~[0029]~~[0051] In addition, unless explicitly described to the contrary, the word "comprise" and variations such as "comprises" or "comprising" will be understood to imply the inclusion of stated elements but not the exclusion of any other elements.

[0052] ~~Hereinafter, a~~Nevertheless, even though each of the pixels are drawn as stereotypical polygonal shapes in the drawings, the present invention is not limited to this shape. That is, the shapes of the pixels may be modified to avoid interference with the other components of the OLED (e.g., wirings) within the spirit and scope of the appended claims.

~~[0030]~~[0053] A pixel arrangement structure (or pixel arrangement) of an OLED display according to ~~an~~a first exemplary embodiment will be described with reference to ~~the drawing. The drawing~~FIG. 1. FIG. 1 is a view schematically showing a portion of pixels forming an OLED display.

~~[0031] The drawing shows a pixel arrangement structure of an OLED display according to an exemplary embodiment of the present invention.~~

~~[0032]~~ As shown in ~~the drawing~~FIG. 1, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300.

[0033][0054] ~~According to one embodiment~~Here, the pixel refers to a minimum unit for displaying an image (for example, the minimum addressable unit of the display).

[0034][0055] ~~In one embodiment~~Further, among the first pixels 100, the second pixels 200, and the third pixels 300, power lines for driving each of the pixels, such as a gate line, a data line, a driving power line, and the like, ~~are~~may be located. In addition, ~~in one embodiment,~~ an insulation layer, such as a pixel defining layer, for defining each of the pixels ~~is~~may be disposed. ~~Further, in one embodiment~~Finally, an OLED including an anode, an organic emission layer, and a cathode to correspond to each of the first pixels 100, the second pixels 200, and the third pixels 300 ~~is~~may be disposed. These configurations are technologies known in the art and further description thereof is omitted for ease of description. ~~In one embodiment, the~~A shape of each of the pixels ~~is~~may be defined by the power lines, the pixel defining layer, the anode, or the like, but is not limited thereto.

[0056] In the pixel arrangement of ~~the drawing~~FIG. 1, each of the first pixels 100 has a smaller area ~~(e.g., is smaller in area)~~ than neighboring second pixels 200 and third pixels 300, and has a quadrilateral (i.e., four-sided) shape among polygon ~~shape~~shapes. For example, in the pixel arrangement of FIG. 1, each of the first pixels 100 has the same quadrilateral shape (e.g., a square or rhombus). The first pixels 100 are spaced apart from each other and arranged in rows, such as along a first virtual straight line VL1. The first pixels 100 emit green light, and may include an organic emission layer for emitting green light.

[0057] The second pixels 200 are arranged diagonally with respect to the first pixels 100, such as at first vertices P1 along one diagonal of a virtual square VS having one of the first pixels 100 as a center point (or center) of the virtual square VS. In ~~the drawing~~a similar fashion, the third pixels 300 are arranged diagonally with respect to the first pixels 100, such as at second vertices P2 along the other diagonal of the virtual square VS.

[0058] In the virtual square VS, each of the second pixels 200 is separated from the first pixel 100, and is centered at one of the first vertices P1 of the virtual square VS. Each of the second pixels 200 has a larger area than the neighboring first pixel 100 and has an octagonal (i.e., eight-sided) shape. In FIG. 1, the second pixels 200 each have the same octagonal shape. In addition, the second pixels 200 are arranged diagonally and separated from each other by the first pixels 100. The second pixels 200 emit blue light, and may include an organic emission layer for emitting blue light.

[0059] In a similar fashion, in the virtual square VS, each of the third pixels 300 is separated from the first pixel 100 and the second pixels 200, and is centered at one of the second vertices P2 neighboring the first vertices P1 of the virtual square VS. Each of the third pixels 300 has a larger area than the neighboring first pixel 100 and the same area as each of the second pixels 200. Further, the third pixels have an octagonal shape (e.g., similar to or the same as the second pixels 200). In FIG. 1, the third pixels 300 each have the same octagonal shape. In addition, the third pixels 300 are arranged diagonally and separated from each other by the first pixels 100. The third pixels 300 emit red light, and may include an organic emission layer for emitting red light.

[0060] The third pixels 300 and the second pixels 200 are spaced apart from each other and alternately arranged in rows, such as along a second virtual straight line VL2. In a similar fashion, the third pixels 300 and the second pixels 200 are spaced apart from each other and alternately arranged in columns. Accordingly, in the virtual square VS, two of the second pixels 200 having their corresponding centers positioned at the first vertices P1 and two of the third pixels 300 having their corresponding centers positioned at the second vertices P2 to enclose a corresponding one of the first pixels 100 (e.g., in the virtual square VS).

[0061] As described above, the center of each of the second pixels 200 is positioned at one of the first vertices P1 of the virtual square VS. In addition, the center of the corresponding first pixel 100 is the center of the virtual square VS. Further, the center of

each of the third pixels 300 is positioned at one of the second vertices P2. Moreover, the second pixels 200 and the third pixels 300 each have the same area.

[0062] As a non-limiting example, the distance (e.g., a shortest distance) between one of the first pixels 100 and an adjacent one of the second pixels 200 is a first length L1, the distance between one of the first pixels 100 and an adjacent one of the third pixels 300 is the same first length L1, and the distance between one of the second pixels 200 and an adjacent one of the third pixels 300 is the same first length L1, as shown in FIG. 1. In addition, the distance (e.g., a shortest distance) between the neighboring first pixels 100 is a second length L2 that is longer than the first length L1. It should be noted that L1, L2, L3, . . . may be used throughout to represent shortest distances between corresponding pixels.

[0063] Therefore, the gap of the first length L1 is formed between adjacent pairs of the first pixels 100 and the second pixels 200, between adjacent pairs of the first pixels 100 and the third pixels 300, and between adjacent pairs of the second pixels 200 and the third pixels 300. In addition, the gap of the second length L2 that is longer than the first length L1 is formed between the neighboring ones of the first pixels 100. This results in improved deposition reliability when using a fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0064] In addition, by enclosing each of the first pixels 100 by a pair of the second pixels 200 and a pair of the third pixels 300, the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300 may be improved. Accordingly, a manufacturing time and manufacturing cost of the entire OLED display may be reduced and the display quality of the image of the OLED display may be improved.

[0065] As described above, in the pixel arrangement structure of the OLED display of FIG. 1, the first pixels 100, the second pixels 200, and the third pixels 300 have polygonal shapes (e.g., the first pixels have a quadrilateral shape and the second pixels

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200 and the third pixels 300 have an octagonal shape). In addition, it is worth considering that the deposition process of the organic emission layer is one of the unique manufacturing characteristics of the OLED display. Accordingly, to improve the deposition reliability of the organic emission layer in the deposition process using the fine metal mask and to improve the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300, the center of each of the first pixels 100 is positioned at the center of a virtual square VS formed by a first pair of diagonal vertices P1 and a second pair of diagonal vertices P2. In the virtual square VS, the centers of a pair of the second pixels 200 are positioned at the first vertices P1, and the centers of a pair of the third pixels 300 are positioned at the second vertices P2.

[0066] In addition, in the pixel arrangement structure of the OLED display of FIG. 1, the first pixels 100, the second pixels 200, and the third pixels 300 respectively emit green, blue, and red light. However, in pixel arrangement structures of other OLED displays, the first pixels 100, the second pixels 200, and the third pixels 300 may emit light of different colors. For example, at least one of the second pixels 200 or the third pixels may emit white light.

[0067] Next, a pixel arrangement structure of an OLED display according to a second exemplary embodiment will be described with reference to FIG. 2. Parts that are different from the exemplary embodiment of FIG. 1 will be described, while the description of parts that are equivalent to the first exemplary embodiment may be omitted. For better comprehension and ease of description, constituent elements of the second exemplary embodiment that are the same as or similar to those of the first embodiment of FIG. 1 will have the same reference numerals.

[0068] As shown in FIG. 2, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300. The plurality of first pixels 100 have the same quadrilateral shape (e.g., a parallelogram). In addition, the second pixels 200 have a larger area than the third

pixels 300. The second pixels 200 and the third pixels 300 may have polygonal shapes, such as octagonal or hexagonal (i.e., six-sided).

[0069] In a similar fashion to that of FIG. 1, the centers of a pair of the second pixels 200 are positioned at first vertices P1 along one diagonal of a virtual square VS having a center coinciding with a center of one of the first pixels 100. In addition, the centers of a pair of the third pixels 300 are positioned at second vertices P2 along another diagonal of the virtual square VS. However, in FIG. 2, the second pixels 200 have a larger area than the third pixels 300.

[0070] As a non-limiting example, the distance between adjacent ones of the second pixels 200 and the third pixels 300 is a third length L3, while the distance between each of the first pixels 100 and adjacent ones of the second pixels 200 or the third pixels 300 have a same fourth length L4. In addition, the distance between neighboring ones of the first pixels 100 is a fifth length L5 that is longer than the third length L3 and the fourth length L4.

[0071] Accordingly, the gap of the fourth length L4 is formed between adjacent pairs of the first pixels 100 and the second pixels 200, and between adjacent pairs of the first pixels 100 and the third pixels 300. In addition, the gap of the third length L3 is formed between adjacent pairs of the second pixels 200 and the third pixels 300. Further, the gap of the fifth length L5 that is longer than the third length L3 and the fourth length L4 is formed between the neighboring ones of the first pixels 100. This results in improved deposition reliability in the deposition process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0072] In addition, by enclosing each of the first pixels 100 by a pair of the second pixels 200 and a pair of the third pixels 300, the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300 may be improved. Accordingly, the

manufacturing time and the manufacturing cost of the OLED display may be reduced and the display quality of the image of the OLED display may be improved.

[0073] Further, in the pixel arrangement structure of the OLED display of FIG. 2, the second pixels 200 that emit blue have the shortest life span among the first pixels 100, the second pixels 200, and the third pixels 300. Accordingly, the second pixels 200 have a larger area than the third pixels 300, thereby suppressing the deterioration of the life span of the OLED display. That is, the pixel arrangement structure of the OLED display of FIG. 2 provides improved life span.

[0074] Next, a pixel arrangement structure of an OLED display according to a third exemplary embodiment will be described with reference to FIG. 3. Parts that are different from the above exemplary embodiments will be described, while the description of parts that are equivalent to the above exemplary embodiments may be omitted. For better comprehension and ease of description, constituent elements of the third exemplary embodiment that are the same as or similar to the above exemplary embodiments will have the same reference numerals.

[0075] As shown in FIG. 3, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300. Among the plurality of first pixels 100, the neighboring first pixels 100 have a quadrilateral shape (e.g., parallelogram) and are symmetrical to each other. In addition, the second pixels 200 have a larger area than the third pixels 300. The second pixels 200 and the third pixels may have polygonal shapes (e.g., hexagonal or octagonal).

[0076] In a similar fashion to that of FIGs. 1–2, the centers of a pair of the second pixels 200 are positioned at first vertices P1 along one diagonal of a virtual square VS having a center coinciding with a center of one of the first pixels 100. In addition, the centers of a pair of the third pixels 300 are positioned at second vertices P2 along another diagonal of the virtual square VS. However, in FIG. 3, the neighboring first

pixels 100 have a quadrilateral shape and are symmetrical to each other, while the second pixels 200 have a larger area than the third pixels 300. This results in improved deposition reliability in the deposition process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0077] In addition, by placing each of the first pixels 100 between a pair of the second pixels 200 and between a pair of the third pixels 300, the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300 may be improved. Accordingly, the manufacturing time and the manufacturing cost of the OLED display may be reduced and the display quality of the image of the OLED display may be improved.

[0078] Further, in the pixel arrangement structure of the OLED display of FIG. 3, the second pixels 200 that emit blue have the shortest life span among the first pixels 100, the second pixels 200, and the third pixels 300. Accordingly, the second pixels 200 have a larger area than the third pixels 300, thereby suppressing the deterioration of the life span of the OLED display. That is, the pixel arrangement structure of the OLED display provides improved life span.

[0079] Next, a pixel arrangement structure of an OLED display according to a fourth exemplary embodiment will be described with reference to FIG. 4. Parts that are different from the above exemplary embodiments will be described, while the description of parts that are equivalent to the above exemplary embodiments may be omitted. For better comprehension and ease of description, constituent elements of the fourth exemplary embodiment that are the same as or similar to the above exemplary embodiments will have the same reference numerals.

[0080] As shown in FIG. 4, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300. Among the plurality of first pixels 100, the neighboring first pixels 100 have a quadrilateral shape (e.g., parallelogram) and are symmetrical to each other. In

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addition, the third pixels 300 have a larger area than the second pixels 200. The second pixels 200 and the third pixels may have polygonal shapes (e.g., hexagonal or octagonal).

[0081] In a similar fashion to that of FIGs. 1–3, the centers of a pair of the second pixels 200 are positioned at the first vertices P1 along one diagonal of a virtual square VS having a center coinciding with a center of one of the first pixels 100. In addition, the centers of a pair of the third pixels 300 are positioned at second vertices P2 along another diagonal of the virtual square VS. However, in FIG. 4, the neighboring first pixels 100 have a quadrilateral shape and are symmetrical to each other, while the third pixels 300 have a larger area than the second pixels 200. This results in improved deposition reliability in the deposition process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0082] In addition, by enclosing each of the first pixels 100 by a pair of the second pixels 200 and a pair of the third pixels 300, the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300 may be improved. Accordingly, the manufacturing time and the manufacturing cost of the OLED display may be reduced and the display quality of the image of the OLED display may be improved.

[0083] Next, a pixel arrangement structure of an OLED display according to a fifth exemplary embodiment will be described with reference to FIG. 5. Parts that are different from the above exemplary embodiments will be described, while the description of parts that are equivalent to the above exemplary embodiments may be omitted. For better comprehension and ease of description, constituent elements of the fifth exemplary embodiment that are the same as or similar to the above exemplary embodiments will have the same reference numerals.

[0084] As shown in FIG. 5, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of

third pixels 300. Among the plurality of first pixels 100, the neighboring first pixels 100 have a octagonal shape and are symmetrical to each other. In addition, the second pixels 200 have a larger area than the third pixels 300. The second pixels 200 and the third pixels 300 may have quadrilateral shapes (e.g., rhombus).

[0085] In a similar fashion to that of FIGs. 1–3, the centers of a pair of the second pixels 200 are positioned at the first vertices P1 along one diagonal of a virtual square VS having a center coinciding with a center of one of the first pixels 100. In addition, the centers of a pair of the third pixels 300 are positioned at second vertices P2 along another diagonal of the virtual square VS. However, in FIG. 5, the neighboring first pixels 100 have a octagonal shape and are symmetrical to each other, while the second pixels 200 have a larger area than the third pixels 300. This results in improved deposition reliability in the deposition process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0086] In addition, by enclosing each of the first pixels 100 by a pair of the second pixels 200 and a pair of the third pixels 300, the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300 may be improved. Accordingly, the manufacturing time and the manufacturing cost of the OLED display may be reduced and the display quality of the image of the OLED display may be improved.

[0087] Hereinafter, a pixel arrangement structure (or pixel arrangement) of an OLED display according to an exemplary embodiment will be described with reference to FIG. 6. FIG. 6 is a view schematically showing a portion of pixels forming an OLED display.

[0088] FIG. 6 shows a pixel arrangement structure of an OLED display according to an exemplary embodiment of the present invention.

[0089] As shown in FIG. 6, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300.

[0090] According to one embodiment, the pixel refers to a minimum unit for displaying an image (for example, the minimum addressable unit of the display).

[0091] In one embodiment, among the first pixels 100, the second pixels 200, and the third pixels 300, power lines for driving each of the pixels, such as a gate line, a data line, a driving power line, and the like, are located. In addition, in one embodiment, an insulation layer, such as a pixel defining layer, for defining each of the pixels is disposed. Further, in one embodiment, an OLED including an anode, an organic emission layer, and a cathode to correspond to each of the first pixels 100, the second pixels 200, and the third pixels 300 is disposed. These configurations are technologies known in the art and further description thereof is omitted for ease of description. In one embodiment, the shape of each of the pixels is defined by the power lines, the pixel defining layer, the anode, or the like.

~~[0035]~~[0092] In the pixel arrangement of FIG. 6, each of the first pixels 100 has a smaller area (e.g., is smaller in area) than neighboring second pixels 200 and third pixels 300, and has a polygon shape. In FIG. 6, the first pixels 100 have an octagonal shape among the polygon shapes. In other embodiments, the first pixels 100 have one or more of various polygon shapes such as a triangle, a rectangle, a pentagon, a hexagon, a heptagon, and the like. For example, the first pixels 100 that neighbor each other among the plurality of first pixels 100 have hexagon shapes that are symmetrical to each other. In one embodiment, each of the plurality of first pixels 100 has the same hexagonal shape.

~~[0036]~~[0093] In one embodiment, the first pixels 100 are spaced apart from each other and arranged in rows, such as along a first virtual straight line VL1. In one embodiment, the first pixels 100 emit green light, and include an organic emission layer for emitting green light. In other embodiments, the first pixels 100 include an organic emission layer that emits light of one or more of various colors such as blue, red, or white color for emitting blue light, red light, or white light.

[0037][0094] In the drawingFIG. 6, the second pixels 200 are arranged diagonally with respect to the first pixels 100, namely at first vertices P1 along one diagonal of a virtual square VS having one of the first pixels 100 as a center point (or center) of the virtual square VS. In a similar fashion, in the drawingFIG. 6, the third pixels 300 are arranged diagonally with respect to the first pixels 100, namely at second vertices P2 along the other diagonal of the virtual square VS.

[0038][0095] In the virtual square VS of the drawingFIG. 6, each of the second pixels 200 is separated from the first pixel 100, and is centered at one of the first vertices P1 of the virtual square VS. Each of the second pixels 200 has a larger area than the neighboring first pixel 100 and the neighboring third pixels 300, and has a hexagonal shape. In other embodiments, the second pixels 200 have one or more of various polygonal shapes such as a triangle, a rectangle, a pentagon, a hexagon, a heptagon, and the like.

[0039][0096] In the drawingFIG. 6, the second pixels 200 each have the same hexagonal shape. In addition, the second pixels 200 are arranged diagonally and separated from each other by the first pixels 100. In one embodiment, the second pixels 200 emit blue light, and include an organic emission layer for emitting blue light. In other embodiments, the second pixels 200 include an organic emission layer that emits light of one or more of various colors such as red, green, or white for emitting red light, green light, or white light.

[0040][0097] In a similar fashion, in the virtual square VS of the drawingFIG. 6, each of the third pixels 300 is separated from the first pixel 100 and the second pixels 200, and is centered at one of the second vertices P2 neighboring the first vertices P1 of the virtual square VS. Each of the third pixels 300 has a larger area than the neighboring first pixel 100 and a smaller area than the neighboring second pixels 200. The third pixels 300 has a quadrilateral shape among polygon shapes. In other embodiments, the third pixels

300 have one or more of various polygonal shapes such as a triangle, a rectangle, a pentagon, a hexagon, a heptagon, and the like.

[0041][0098] In ~~the drawing~~FIG. 6, the third pixels 300 each have the same quadrilateral shape. In addition, the third pixels 300 are arranged diagonally and separated from each other by the first pixels 100. In one embodiment, the third pixels 300 emit red light, and include an organic emission layer for emitting red light. In other embodiments, the third pixels 300 include an organic emission layer that emits light of one or more of various colors such as blue, green, or white for emitting emit blue light, green light, or white light.

[0042][0099] In ~~the drawing~~FIG. 6, each of the second pixels 200 and the third pixels 300 has a hexagonal shape and a quadrilateral shape, respectively. In another embodiment, each of the second pixels 200 and the third pixels 300 respectively has a quadrilateral shape and a hexagonal shape. That is, in this other embodiment, one of the second pixels 200 or the third pixels 300 has a hexagonal shape and the other has a quadrilateral shape.

[0043][00100] In one embodiment, the first pixels 100, the second pixels 200, and the third pixels 300 respectively emit green light, blue light, and red light. In other embodiments, the first pixels 100, the second pixels 200, and the third pixels 300 emit light of the same color. In still other embodiments, the first pixels 100, the second pixels 200, and the third pixels 300 emit light of different colors. In some embodiments, the first pixels 100 emit green light, and one of the second pixels 200 or the third pixels 300 emit blue light while the other emit red light.

[0044][00101] In ~~the drawing~~FIG. 6, third pixels 300 and the second pixels 200 are spaced apart from each other and alternately arranged in rows, such as along a second virtual straight line VL2. In a similar fashion, in ~~the drawing~~FIG. 6, the third pixels 300 and the second pixels 200 are spaced apart from each other and alternately arranged in columns. Accordingly, in ~~the drawing~~FIG. 6, in the virtual square VS, two of the second pixels 200 have their corresponding centers positioned at the first vertices P1 and two of

the third pixels 300 have their corresponding centers positioned at the second vertices P2 to enclose a corresponding one of the first pixels 100 in the virtual square VS.

[0046][00102] As described and illustrated in ~~the drawing~~FIG. 6, the center of each of the second pixels 200 is positioned at one of the first vertices P1 of the virtual square VS. In addition, the center of the corresponding first pixel 100 is the center of the virtual square VS. Further, the center of each of the third pixels 300 is positioned at one of the second vertices P2. Therefore, the plurality of second pixels 200 of which the centers are positioned at the first vertices P1 and the plurality of third pixels 300 of which the centers are positioned at the second vertices P2 respectively enclose one of the first pixels 100 in the virtual square VS.

[0046][00103] Further, and as illustrated in ~~the drawing~~FIG. 6, the first pixels 100, the second pixels 200, and the third pixels 300 have polygon shapes. In ~~the drawing~~FIG. 6, the distance between one of the first pixels 100 and an adjacent one of the second pixels 200 as well as a distance between one of the first pixels 100 and an adjacent one of the third pixels 300 is the same first length L1. In addition, a distance between one of the second pixels 200 and an adjacent one of the third pixels 300 is a second length L2 that is different from the first length L1. Further, in ~~the drawing~~FIG. 6, a distance between neighboring first pixels 100 is a third length L3 that is longer than the first length L1 and the second length L2.

[0047][00104] For example, in some embodiments, the first length L1 is between 15 um (micrometers) and 35 um, the second length L2 is between 20 um and 45 um, and the third length L3 is between 25 um and 65 um.

[0048][00105] Therefore, gaps of the first length L1 are formed between adjacent pairs of the first pixels 100 and the second pixels 200, and between adjacent pairs of the first pixels 100 and the third pixels 300. In addition, the gaps of the third length L3 that is longer than the first length L1 are formed between the neighboring ones of the first pixels 100. In one embodiment, this results in improved deposition reliability in the deposition

process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

~~[0049]~~[00106] In addition, in one embodiment, the plurality of second pixels 200 and the plurality of third pixels 300 are arranged to enclose the first pixels 100 in the virtual squares VS so that an aperture ratio of each of the first pixels 100, the second pixels 200, and the third pixels 300 can be improved. Accordingly, in one embodiment, the manufacturing time and the manufacturing cost of the OLED display is reduced and the display quality of the image of the OLED display is improved.

~~[0050]~~[00107] Further, in the pixel arrangement structure of the OLED display of ~~the drawing~~FIG. 6 according to an exemplary embodiment of the present invention, the second pixels 200 that emit blue light have the shortest life span among the first pixels 100, the second pixels 200, and the third pixels 300. Accordingly, the second pixels 200 have a larger area than the first pixels 100 and the third pixels 300, thereby suppressing the deterioration of the life span of the OLED display. That is, in one embodiment, the pixel arrangement structure of the OLED display of ~~the drawing~~FIG. 6 provides improved life span.

~~[0051]~~[00108] As described above, in the pixel arrangement structure of the OLED display of ~~the drawing~~FIG. 6 according to an exemplary embodiment of the present invention, the first pixels 100, the second pixels 200, and the third pixels 300 have simple polygonal shapes such as an octagon, a hexagon, and a quadrangle. In consideration of the deposition process of the organic emission layer, which in one embodiment is a unique manufacturing feature of the OLED display, a center of one of the first pixels 100 is positioned at the center of the virtual square VS, a center of one of the second pixels 200 is positioned at the first vertex P1, and a center of one of the third pixels 300 is positioned at the second vertex P2 to both improve deposition reliability of the organic

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emission layer in the deposition process using the fine metal mask and improve an aperture of each of the first, second, and third pixels 100, 200, and 300.

[0052][00109] That is, according to an exemplary embodiment of the present invention as illustrated in ~~the drawing~~FIG. 6, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100 having an octagonal shape, a plurality of second pixels 200 having a hexagonal shape, and a plurality of third pixels 300 having a quadrilateral shape. In one or more embodiments, the shapes and arrangement of the first pixels 100, the second pixels 200, and the third pixels 300 improve the deposition reliability of the organic emission layer while also improving the aperture ratio of each of the first pixels 100, the second pixels, 200, and the third pixels 300.

[0053][00110] While this invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims, and equivalents thereof.

<Description of some symbols>

first pixel 100, second pixels 200, third pixels 300

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PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation in part of U.S. Application No. 13/614,197, filed September 13, 2012, which claims priority to and the benefit of Korean Patent Application No. 10-2012-0022967, filed in the Korean Intellectual Property Office on March 6, 2012. This application also claims priority to and the benefit of Korean Patent Application No. 10-2013-0044993, filed in the Korean Intellectual Property Office on April 23, 2013. The entire contents of all of these are incorporated herein by reference.

BACKGROUND

1. Field

[0002] Aspects of embodiments of the present invention relate generally to a pixel arrangement structure for an organic light emitting diode (OLED) display.

2. Description of the Related Art

[0003] A display device is a device that displays an image. Recently, an OLED display has been drawing attention.

[0004] The OLED display has a self-luminous characteristic. Because the OLED display does not need a separate light source, unlike a liquid crystal display, it can have a relatively smaller thickness and weight than liquid crystal displays. In addition, the OLED display exhibits high-quality characteristics such as low power consumption, high luminance, high response speed, etc.

[0005] In general, the OLED display includes a plurality of pixels for emitting light of different colors. The plurality of pixels emit light to display an image.

[0006] Here, the pixel refers to a minimum unit for displaying the images. For instance, there may be a gate line, a data line, and a power line such as a driving power line to drive each pixel. In addition, there may be an insulation layer such as a pixel definition layer to define an area and a shape of each pixel. Further, each pixel may be positioned between its neighboring pixels.

[0007] An organic emission layer included in the pixel of an OLED display may be deposited and formed by using a mask such as a fine metal mask (FMM). When reducing a gap between the neighboring pixels to obtain a high aperture ratio of the pixels, deposition reliability may be deteriorated. On the other hand, when increasing the gap between the pixels to improve the deposition reliability, the aperture ratio of the pixels may be deteriorated.

[0008] The above information disclosed in this Background section is only for enhancement of understanding of the background of the invention and therefore it may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

SUMMARY

[0009] Aspects of embodiments of the present invention relate generally to a pixel arrangement structure for an OLED display. More particularly, aspects of embodiments of the present invention relate to a pixel arrangement structure of an OLED display that displays an image by emitting light through a plurality of pixels.

[0010] An exemplary embodiment of the present invention provides a pixel arrangement structure for an OLED display having an improved aperture ratio of each of the pixels while efficiently setting up gaps between the pixels.

[0011] According to an exemplary embodiment of the present invention, a pixel arrangement structure of an organic light emitting diode display is provided. The pixel arrangement structure includes: a first pixel having a center coinciding with a center of a

virtual square; a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square.

[0012] The second pixel may include a pair of second pixels. The second pixels may be separated from each other by the first pixel.

[0013] The third pixel may include a pair of third pixels. The third pixels may be separated from each other by the first pixel.

[0014] The second pixels and the third pixels may enclose the first pixel in the virtual square.

[0015] The first pixel, the second pixels, and the third pixels may have polygonal shapes. The second pixels and the third pixels may have a larger area than the first pixel.

[0016] The first pixel may have a quadrilateral shape. The second pixels and the third pixels may have hexagonal or octagonal shapes.

[0017] The second pixels and the third pixels may have octagonal shapes.

[0018] The second pixels and the third pixels may have a same area. A distance between the first pixel and the second pixels, a distance between the first pixel and the third pixels, and a distance between the second pixels and the third pixels may be a same first length.

[0019] The first pixel may include a plurality of first pixels. The plurality of first pixels may have a same quadrilateral shape. A distance between neighboring ones of the plurality of first pixels may be a second length that is longer than the first length.

[0020] The second pixels may have a larger area than the third pixels. A distance between the second pixels and the third pixels may be a first length. A distance between the first pixel and the second pixels, and a distance between the first pixel and the third pixels may be a same second length.

[0021] The first pixel may include a plurality of first pixels. The plurality of first pixels may have a same quadrilateral shape. A distance between neighboring ones of the plurality of first pixels may be a third length that is longer than the first length and the second length.

[0022] The first pixel may include a plurality of first pixels. Neighboring ones of the plurality of first pixels may have quadrilateral shapes that are symmetrical to each other. A distance between the neighboring ones of the plurality of first pixels may be a third length that is longer than the first length and the second length.

[0023] The first pixel may include a plurality of first pixels. Neighboring ones of the plurality of first pixels may have quadrilateral shapes that are symmetrical to each other.

[0024] The second pixels may have a larger area than the third pixels.

[0025] The third pixels may have a larger area than the second pixels.

[0026] The first pixel, the second pixel, and the third pixel may be configured to emit different color lights.

[0027] The first pixel, the second pixel, and the third pixel may be configured to emit green light, blue light, and red light, respectively.

[0028] According to an exemplary embodiment of the present invention, a pixel arrangement structure of an organic light emitting diode (OLED) display is provided. The pixel arrangement structure includes: a first pixel having a center coinciding with a center of a virtual square; a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square. The first pixel, the second pixel, and the third pixel have polygonal shapes.

[0029] In one embodiment, the second pixel includes a pair of second pixels, and the second pixels are separated from each other by the first pixel.

[0030] In one embodiment, the third pixel includes a pair of third pixels, and the third pixels are separated from each other by the first pixel.

[0031] In one embodiment, the second pixel includes a pair of second pixels, the third pixel includes a pair of third pixels, and the second pixels and the third pixels enclose the first pixel in the virtual square.

[0032] In one embodiment, each of the second pixels and the third pixels is larger in area than the first pixel.

[0033] In one embodiment, the first pixel has an octagonal shape, and at least one of the second pixel or the third pixel has an octagonal shape.

[0034] In one embodiment, the first pixel has an octagonal shape, and one of the second pixel or the third pixel has a hexagonal shape and an other of the second pixel or the third pixel has a quadrilateral shape.

[0035] In one embodiment, the virtual square includes a pair of virtual squares sharing a common side, the first pixel includes a pair of first pixels having centers respectively coinciding with centers of the virtual squares, and the first pixels have octagonal shapes that are symmetrical to each other.

[0036] In one embodiment, each of the second pixels is larger in area than each of the third pixels.

[0037] In one embodiment, a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length.

[0038] In one embodiment, the virtual square includes a pair of virtual squares sharing a common side, the first pixel includes a pair of first pixels having centers respectively coinciding with centers of the virtual squares, a distance between each of the second pixels and the third pixels is a same second length, and a distance between the first pixels is a third length that is longer than the first length and the second length.

[0039] In one embodiment, the first pixel, the second pixel, and the third pixel are configured to emit different color light.

[0040] In one embodiment, the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and an other of the second pixel or the third pixel is configured to emit red light.

[0041] According to an exemplary embodiment of the present invention, the pixel arrangement structure of the OLED display improves the aperture ratio of the pixels while efficiently setting up the gaps between the pixels.

BRIEF DESCRIPTION OF THE DRAWINGS

[0042] FIG. 1 is a view of a pixel arrangement structure of an OLED display according to a first exemplary embodiment.

[0043] FIG. 2 is a view of a pixel arrangement structure of an OLED display according to a second exemplary embodiment.

[0044] FIG. 3 is a view of a pixel arrangement structure of an OLED display according to a third exemplary embodiment.

[0045] FIG. 4 is a view of a pixel arrangement structure of an OLED display according to a fourth exemplary embodiment.

[0046] FIG. 5 is a view of a pixel arrangement structure of an OLED display according to a fifth exemplary embodiment.

[0047] FIG. 6 is a view of a pixel arrangement structure of an OLED display according to a sixth exemplary embodiment.

DETAILED DESCRIPTION

[0048] Several exemplary embodiments according to the present invention are described hereinafter in detail with reference to the accompanying drawing to allow one of ordinary skill in the art to practice the invention without undue experimentation. The present invention can be embodied in several different forms, and is not limited to the exemplary embodiments that are described herein.

[0049] In order to clarify the description of embodiments of the present invention, parts that are not related to the invention may be omitted. In addition, the same elements or equivalents are referred to with the same reference numerals throughout the specification.

[0050] Further, since sizes and thicknesses of constituent members shown in the accompanying drawing may be arbitrarily given for better understanding and ease of description, the present invention is not limited to the illustrated sizes and thicknesses.

[0051] In addition, unless explicitly described to the contrary, the word "comprise" and variations such as "comprises" or "comprising" will be understood to imply the inclusion of stated elements but not the exclusion of any other elements.

[0052] Nevertheless, even though each of the pixels are drawn as stereotypical polygonal shapes in the drawings, the present invention is not limited to this shape. That is, the shapes of the pixels may be modified to avoid interference with the other components of the OLED (e.g., wirings) within the spirit and scope of the appended claims.

[0053] A pixel arrangement structure (or pixel arrangement) of an OLED display according to a first exemplary embodiment will be described with reference to FIG. 1. FIG. 1 is a view schematically showing a portion of pixels forming an OLED display.

[0054] As shown in FIG. 1, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300. Here, the pixel refers to a minimum unit for displaying an image (for example, the minimum addressable unit of the display).

[0055] Further, among the first pixels 100, the second pixels 200, and the third pixels 300, power lines for driving each of the pixels, such as a gate line, a data line, a driving power line, and the like, may be located. In addition, an insulation layer, such as a pixel defining layer, for defining each of the pixels may be disposed. Finally, an OLED including an anode, an organic emission layer, and a cathode to correspond to each of

the first pixels 100, the second pixels 200, and the third pixels 300 may be disposed. These configurations are technologies known in the art and further description thereof is omitted for ease of description. A shape of each of the pixels may be defined by the power lines, the pixel defining layer, the anode, or the like, but is not limited thereto.

[0056] In the pixel arrangement of FIG. 1, each of the first pixels 100 has a smaller area than neighboring second pixels 200 and third pixels 300, and has a quadrilateral (i.e., four-sided) shape among polygon shapes. For example, in the pixel arrangement of FIG. 1, each of the first pixels 100 has the same quadrilateral shape (e.g., a square or rhombus). The first pixels 100 are spaced apart from each other and arranged in rows, such as along a first virtual straight line VL1. The first pixels 100 emit green light, and may include an organic emission layer for emitting green light.

[0057] The second pixels 200 are arranged diagonally with respect to the first pixels 100, such as at first vertices P1 along one diagonal of a virtual square VS having one of the first pixels 100 as a center point (or center) of the virtual square VS. In a similar fashion, the third pixels 300 are arranged diagonally with respect to the first pixels 100, such as at second vertices P2 along the other diagonal of the virtual square VS.

[0058] In the virtual square VS, each of the second pixels 200 is separated from the first pixel 100, and is centered at one of the first vertices P1 of the virtual square VS. Each of the second pixels 200 has a larger area than the neighboring first pixel 100 and has an octagonal (i.e., eight-sided) shape. In FIG. 1, the second pixels 200 each have the same octagonal shape. In addition, the second pixels 200 are arranged diagonally and separated from each other by the first pixels 100. The second pixels 200 emit blue light, and may include an organic emission layer for emitting blue light.

[0059] In a similar fashion, in the virtual square VS, each of the third pixels 300 is separated from the first pixel 100 and the second pixels 200, and is centered at one of the second vertices P2 neighboring the first vertices P1 of the virtual square VS. Each of the third pixels 300 has a larger area than the neighboring first pixel 100 and the same

area as each of the second pixels 200. Further, the third pixels have an octagonal shape (e.g., similar to or the same as the second pixels 200). In FIG. 1, the third pixels 300 each have the same octagonal shape. In addition, the third pixels 300 are arranged diagonally and separated from each other by the first pixels 100. The third pixels 300 emit red light, and may include an organic emission layer for emitting red light.

[0060] The third pixels 300 and the second pixels 200 are spaced apart from each other and alternately arranged in rows, such as along a second virtual straight line VL2. In a similar fashion, the third pixels 300 and the second pixels 200 are spaced apart from each other and alternately arranged in columns. Accordingly, in the virtual square VS, two of the second pixels 200 having their corresponding centers positioned at the first vertices P1 and two of the third pixels 300 having their corresponding centers positioned at the second vertices P2 to enclose a corresponding one of the first pixels 100 (e.g., in the virtual square VS).

[0061] As described above, the center of each of the second pixels 200 is positioned at one of the first vertices P1 of the virtual square VS. In addition, the center of the corresponding first pixel 100 is the center of the virtual square VS. Further, the center of each of the third pixels 300 is positioned at one of the second vertices P2. Moreover, the second pixels 200 and the third pixels 300 each have the same area.

[0062] As a non-limiting example, the distance (e.g., a shortest distance) between one of the first pixels 100 and an adjacent one of the second pixels 200 is a first length L1, the distance between one of the first pixels 100 and an adjacent one of the third pixels 300 is the same first length L1, and the distance between one of the second pixels 200 and an adjacent one of the third pixels 300 is the same first length L1, as shown in FIG. 1. In addition, the distance (e.g., a shortest distance) between the neighboring first pixels 100 is a second length L2 that is longer than the first length L1. It should be noted that L1, L2, L3, . . . may be used throughout to represent shortest distances between corresponding pixels.

[0063] Therefore, the gap of the first length L1 is formed between adjacent pairs of the first pixels 100 and the second pixels 200, between adjacent pairs of the first pixels 100 and the third pixels 300, and between adjacent pairs of the second pixels 200 and the third pixels 300. In addition, the gap of the second length L2 that is longer than the first length L1 is formed between the neighboring ones of the first pixels 100. This results in improved deposition reliability when using a fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0064] In addition, by enclosing each of the first pixels 100 by a pair of the second pixels 200 and a pair of the third pixels 300, the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300 may be improved. Accordingly, a manufacturing time and manufacturing cost of the entire OLED display may be reduced and the display quality of the image of the OLED display may be improved.

[0065] As described above, in the pixel arrangement structure of the OLED display of FIG. 1, the first pixels 100, the second pixels 200, and the third pixels 300 have polygonal shapes (e.g., the first pixels have a quadrilateral shape and the second pixels 200 and the third pixels 300 have an octagonal shape). In addition, it is worth considering that the deposition process of the organic emission layer is one of the unique manufacturing characteristics of the OLED display. Accordingly, to improve the deposition reliability of the organic emission layer in the deposition process using the fine metal mask and to improve the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300, the center of each of the first pixels 100 is positioned at the center of a virtual square VS formed by a first pair of diagonal vertices P1 and a second pair of diagonal vertices P2. In the virtual square VS, the centers of a pair of the second pixels 200 are positioned at the first vertices P1, and the centers of a pair of the third pixels 300 are positioned at the second vertices P2.

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[0066] In addition, in the pixel arrangement structure of the OLED display of FIG. 1, the first pixels 100, the second pixels 200, and the third pixels 300 respectively emit green, blue, and red light. However, in pixel arrangement structures of other OLED displays, the first pixels 100, the second pixels 200, and the third pixels 300 may emit light of different colors. For example, at least one of the second pixels 200 or the third pixels may emit white light.

[0067] Next, a pixel arrangement structure of an OLED display according to a second exemplary embodiment will be described with reference to FIG. 2. Parts that are different from the exemplary embodiment of FIG. 1 will be described, while the description of parts that are equivalent to the first exemplary embodiment may be omitted. For better comprehension and ease of description, constituent elements of the second exemplary embodiment that are the same as or similar to those of the first embodiment of FIG. 1 will have the same reference numerals.

[0068] As shown in FIG. 2, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300. The plurality of first pixels 100 have the same quadrilateral shape (e.g., a parallelogram). In addition, the second pixels 200 have a larger area than the third pixels 300. The second pixels 200 and the third pixels 300 may have polygonal shapes, such as octagonal or hexagonal (i.e., six-sided).

[0069] In a similar fashion to that of FIG. 1, the centers of a pair of the second pixels 200 are positioned at first vertices P1 along one diagonal of a virtual square VS having a center coinciding with a center of one of the first pixels 100. In addition, the centers of a pair of the third pixels 300 are positioned at second vertices P2 along another diagonal of the virtual square VS. However, in FIG. 2, the second pixels 200 have a larger area than the third pixels 300.

[0070] As a non-limiting example, the distance between adjacent ones of the second pixels 200 and the third pixels 300 is a third length L3, while the distance between each

of the first pixels 100 and adjacent ones of the second pixels 200 or the third pixels 300 have a same fourth length L4. In addition, the distance between neighboring ones of the first pixels 100 is a fifth length L5 that is longer than the third length L3 and the fourth length L4.

[0071] Accordingly, the gap of the fourth length L4 is formed between adjacent pairs of the first pixels 100 and the second pixels 200, and between adjacent pairs of the first pixels 100 and the third pixels 300. In addition, the gap of the third length L3 is formed between adjacent pairs of the second pixels 200 and the third pixels 300. Further, the gap of the fifth length L5 that is longer than the third length L3 and the fourth length L4 is formed between the neighboring ones of the first pixels 100. This results in improved deposition reliability in the deposition process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0072] In addition, by enclosing each of the first pixels 100 by a pair of the second pixels 200 and a pair of the third pixels 300, the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300 may be improved. Accordingly, the manufacturing time and the manufacturing cost of the OLED display may be reduced and the display quality of the image of the OLED display may be improved.

[0073] Further, in the pixel arrangement structure of the OLED display of FIG. 2, the second pixels 200 that emit blue have the shortest life span among the first pixels 100, the second pixels 200, and the third pixels 300. Accordingly, the second pixels 200 have a larger area than the third pixels 300, thereby suppressing the deterioration of the life span of the OLED display. That is, the pixel arrangement structure of the OLED display of FIG. 2 provides improved life span.

[0074] Next, a pixel arrangement structure of an OLED display according to a third exemplary embodiment will be described with reference to FIG. 3. Parts that are different from the above exemplary embodiments will be described, while the description

of parts that are equivalent to the above exemplary embodiments may be omitted. For better comprehension and ease of description, constituent elements of the third exemplary embodiment that are the same as or similar to the above exemplary embodiments will have the same reference numerals.

[0075] As shown in FIG. 3, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300. Among the plurality of first pixels 100, the neighboring first pixels 100 have a quadrilateral shape (e.g., parallelogram) and are symmetrical to each other. In addition, the second pixels 200 have a larger area than the third pixels 300. The second pixels 200 and the third pixels may have polygonal shapes (e.g., hexagonal or octagonal).

[0076] In a similar fashion to that of FIGs. 1–2, the centers of a pair of the second pixels 200 are positioned at first vertices P1 along one diagonal of a virtual square VS having a center coinciding with a center of one of the first pixels 100. In addition, the centers of a pair of the third pixels 300 are positioned at second vertices P2 along another diagonal of the virtual square VS. However, in FIG. 3, the neighboring first pixels 100 have a quadrilateral shape and are symmetrical to each other, while the second pixels 200 have a larger area than the third pixels 300. This results in improved deposition reliability in the deposition process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0077] In addition, by placing each of the first pixels 100 between a pair of the second pixels 200 and between a pair of the third pixels 300, the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300 may be improved. Accordingly, the manufacturing time and the manufacturing cost of the OLED display may be reduced and the display quality of the image of the OLED display may be improved.

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[0078] Further, in the pixel arrangement structure of the OLED display of FIG. 3, the second pixels 200 that emit blue have the shortest life span among the first pixels 100, the second pixels 200, and the third pixels 300. Accordingly, the second pixels 200 have a larger area than the third pixels 300, thereby suppressing the deterioration of the life span of the OLED display. That is, the pixel arrangement structure of the OLED display provides improved life span.

[0079] Next, a pixel arrangement structure of an OLED display according to a fourth exemplary embodiment will be described with reference to FIG. 4. Parts that are different from the above exemplary embodiments will be described, while the description of parts that are equivalent to the above exemplary embodiments may be omitted. For better comprehension and ease of description, constituent elements of the fourth exemplary embodiment that are the same as or similar to the above exemplary embodiments will have the same reference numerals.

[0080] As shown in FIG. 4, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300. Among the plurality of first pixels 100, the neighboring first pixels 100 have a quadrilateral shape (e.g., parallelogram) and are symmetrical to each other. In addition, the third pixels 300 have a larger area than the second pixels 200. The second pixels 200 and the third pixels may have polygonal shapes (e.g., hexagonal or octagonal).

[0081] In a similar fashion to that of FIGs. 1–3, the centers of a pair of the second pixels 200 are positioned at the first vertices P1 along one diagonal of a virtual square VS having a center coinciding with a center of one of the first pixels 100. In addition, the centers of a pair of the third pixels 300 are positioned at second vertices P2 along another diagonal of the virtual square VS. However, in FIG. 4, the neighboring first pixels 100 have a quadrilateral shape and are symmetrical to each other, while the third pixels 300 have a larger area than the second pixels 200. This results in improved

deposition reliability in the deposition process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0082] In addition, by enclosing each of the first pixels 100 by a pair of the second pixels 200 and a pair of the third pixels 300, the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300 may be improved. Accordingly, the manufacturing time and the manufacturing cost of the OLED display may be reduced and the display quality of the image of the OLED display may be improved.

[0083] Next, a pixel arrangement structure of an OLED display according to a fifth exemplary embodiment will be described with reference to FIG. 5. Parts that are different from the above exemplary embodiments will be described, while the description of parts that are equivalent to the above exemplary embodiments may be omitted. For better comprehension and ease of description, constituent elements of the fifth exemplary embodiment that are the same as or similar to the above exemplary embodiments will have the same reference numerals.

[0084] As shown in FIG. 5, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300. Among the plurality of first pixels 100, the neighboring first pixels 100 have a octagonal shape and are symmetrical to each other. In addition, the second pixels 200 have a larger area than the third pixels 300. The second pixels 200 and the third pixels 300 may have quadrilateral shapes (e.g., rhombus).

[0085] In a similar fashion to that of FIGs. 1–3, the centers of a pair of the second pixels 200 are positioned at the first vertices P1 along one diagonal of a virtual square VS having a center coinciding with a center of one of the first pixels 100. In addition, the centers of a pair of the third pixels 300 are positioned at second vertices P2 along another diagonal of the virtual square VS. However, in FIG. 5, the neighboring first pixels 100 have a octagonal shape and are symmetrical to each other, while the second

pixels 200 have a larger area than the third pixels 300. This results in improved deposition reliability in the deposition process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0086] In addition, by enclosing each of the first pixels 100 by a pair of the second pixels 200 and a pair of the third pixels 300, the aperture ratio of the first pixels 100, the second pixels 200, and the third pixels 300 may be improved. Accordingly, the manufacturing time and the manufacturing cost of the OLED display may be reduced and the display quality of the image of the OLED display may be improved.

[0087] Hereinafter, a pixel arrangement structure (or pixel arrangement) of an OLED display according to an exemplary embodiment will be described with reference to FIG. 6. FIG. 6 is a view schematically showing a portion of pixels forming an OLED display.

[0088] FIG. 6 shows a pixel arrangement structure of an OLED display according to an exemplary embodiment of the present invention.

[0089] As shown in FIG. 6, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300.

[0090] According to one embodiment, the pixel refers to a minimum unit for displaying an image (for example, the minimum addressable unit of the display).

[0091] In one embodiment, among the first pixels 100, the second pixels 200, and the third pixels 300, power lines for driving each of the pixels, such as a gate line, a data line, a driving power line, and the like, are located. In addition, in one embodiment, an insulation layer, such as a pixel defining layer, for defining each of the pixels is disposed. Further, in one embodiment, an OLED including an anode, an organic emission layer, and a cathode to correspond to each of the first pixels 100, the second pixels 200, and the third pixels 300 is disposed. These configurations are technologies known in the art and further description thereof is omitted for ease of description. In one embodiment, the

shape of each of the pixels is defined by the power lines, the pixel defining layer, the anode, or the like.

[0092] In the pixel arrangement of FIG. 6, each of the first pixels 100 has a smaller area (e.g., is smaller in area) than neighboring second pixels 200 and third pixels 300, and has a polygon shape. In FIG. 6, the first pixels 100 have an octagonal shape among the polygon shapes. In other embodiments, the first pixels 100 have one or more of various polygon shapes such as a triangle, a rectangle, a pentagon, a hexagon, a heptagon, and the like. For example, the first pixels 100 that neighbor each other among the plurality of first pixels 100 have hexagon shapes that are symmetrical to each other. In one embodiment, each of the plurality of first pixels 100 has the same hexagonal shape.

[0093] In one embodiment, the first pixels 100 are spaced apart from each other and arranged in rows, such as along a first virtual straight line VL1. In one embodiment, the first pixels 100 emit green light, and include an organic emission layer for emitting green light. In other embodiments, the first pixels 100 include an organic emission layer that emits light of one or more of various colors such as blue, red, or white color for emitting blue light, red light, or white light.

[0094] In FIG. 6, the second pixels 200 are arranged diagonally with respect to the first pixels 100, namely at first vertices P1 along one diagonal of a virtual square VS having one of the first pixels 100 as a center point (or center) of the virtual square VS. In a similar fashion, in FIG. 6, the third pixels 300 are arranged diagonally with respect to the first pixels 100, namely at second vertices P2 along the other diagonal of the virtual square VS.

[0095] In the virtual square VS of FIG. 6, each of the second pixels 200 is separated from the first pixel 100, and is centered at one of the first vertices P1 of the virtual square VS. Each of the second pixels 200 has a larger area than the neighboring first pixel 100 and the neighboring third pixels 300, and has a hexagonal shape. In other

embodiments, the second pixels 200 have one or more of various polygonal shapes such as a triangle, a rectangle, a pentagon, a hexagon, a heptagon, and the like.

[0096] In FIG. 6, the second pixels 200 each have the same hexagonal shape. In addition, the second pixels 200 are arranged diagonally and separated from each other by the first pixels 100. In one embodiment, the second pixels 200 emit blue light, and include an organic emission layer for emitting blue light. In other embodiments, the second pixels 200 include an organic emission layer that emits light of one or more of various colors such as red, green, or white for emitting red light, green light, or white light.

[0097] In a similar fashion, in the virtual square VS of FIG. 6, each of the third pixels 300 is separated from the first pixel 100 and the second pixels 200, and is centered at one of the second vertices P2 neighboring the first vertices P1 of the virtual square VS. Each of the third pixels 300 has a larger area than the neighboring first pixel 100 and a smaller area than the neighboring second pixels 200. The third pixels 300 has a quadrilateral shape among polygon shapes. In other embodiments, the third pixels 300 have one or more of various polygonal shapes such as a triangle, a rectangle, a pentagon, a hexagon, a heptagon, and the like.

[0098] In FIG. 6, the third pixels 300 each have the same quadrilateral shape. In addition, the third pixels 300 are arranged diagonally and separated from each other by the first pixels 100. In one embodiment, the third pixels 300 emit red light, and include an organic emission layer for emitting red light. In other embodiments, the third pixels 300 include an organic emission layer that emits light of one or more of various colors such as blue, green, or white for emitting emit blue light, green light, or white light.

[0099] In FIG. 6, each of the second pixels 200 and the third pixels 300 has a hexagonal shape and a quadrilateral shape, respectively. In another embodiment, each of the second pixels 200 and the third pixels 300 respectively has a quadrilateral shape

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and a hexagonal shape. That is, in this other embodiment, one of the second pixels 200 or the third pixels 300 has a hexagonal shape and the other has a quadrilateral shape.

[00100] In one embodiment, the first pixels 100, the second pixels 200, and the third pixels 300 respectively emit green light, blue light, and red light. In other embodiments, the first pixels 100, the second pixels 200, and the third pixels 300 emit light of the same color. In still other embodiments, the first pixels 100, the second pixels 200, and the third pixels 300 emit light of different colors. In some embodiments, the first pixels 100 emit green light, and one of the second pixels 200 or the third pixels 300 emit blue light while the other emit red light.

[00101] In FIG. 6, third pixels 300 and the second pixels 200 are spaced apart from each other and alternately arranged in rows, such as along a second virtual straight line VL2. In a similar fashion, in FIG. 6, the third pixels 300 and the second pixels 200 are spaced apart from each other and alternately arranged in columns. Accordingly, in FIG. 6, in the virtual square VS, two of the second pixels 200 have their corresponding centers positioned at the first vertices P1 and two of the third pixels 300 have their corresponding centers positioned at the second vertices P2 to enclose a corresponding one of the first pixels 100 in the virtual square VS.

[00102] As described and illustrated in FIG. 6, the center of each of the second pixels 200 is positioned at one of the first vertices P1 of the virtual square VS. In addition, the center of the corresponding first pixel 100 is the center of the virtual square VS. Further, the center of each of the third pixels 300 is positioned at one of the second vertices P2. Therefore, the plurality of second pixels 200 of which the centers are positioned at the first vertices P1 and the plurality of third pixels 300 of which the centers are positioned at the second vertices P2 respectively enclose one of the first pixels 100 in the virtual square VS.

[00103] Further, and as illustrated in FIG. 6, the first pixels 100, the second pixels 200, and the third pixels 300 have polygon shapes. In FIG. 6, the distance between one of the

first pixels 100 and an adjacent one of the second pixels 200 as well as a distance between one of the first pixels 100 and an adjacent one of the third pixels 300 is the same first length L1. In addition, a distance between one of the second pixels 200 and an adjacent one of the third pixels 300 is a second length L2 that is different from the first length L1. Further, in FIG. 6, a distance between neighboring first pixels 100 is a third length L3 that is longer than the first length L1 and the second length L2.

[00104] For example, in some embodiments, the first length L1 is between 15 um (micrometers) and 35 um, the second length L2 is between 20 um and 45 um, and the third length L3 is between 25 um and 65 um.

[00105] Therefore, gaps of the first length L1 are formed between adjacent pairs of the first pixels 100 and the second pixels 200, and between adjacent pairs of the first pixels 100 and the third pixels 300. In addition, the gaps of the third length L3 that is longer than the first length L1 are formed between the neighboring ones of the first pixels 100. In one embodiment, this results in improved deposition reliability in the deposition process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[00106] In addition, in one embodiment, the plurality of second pixels 200 and the plurality of third pixels 300 are arranged to enclose the first pixels 100 in the virtual squares VS so that an aperture ratio of each of the first pixels 100, the second pixels 200, and the third pixels 300 can be improved. Accordingly, in one embodiment, the manufacturing time and the manufacturing cost of the OLED display is reduced and the display quality of the image of the OLED display is improved.

[00107] Further, in the pixel arrangement structure of the OLED display of FIG. 6 according to an exemplary embodiment of the present invention, the second pixels 200 that emit blue light have the shortest life span among the first pixels 100, the second pixels 200, and the third pixels 300. Accordingly, the second pixels 200 have a larger

area than the first pixels 100 and the third pixels 300, thereby suppressing the deterioration of the life span of the OLED display. That is, in one embodiment, the pixel arrangement structure of the OLED display of FIG. 6 provides improved life span.

[00108] As described above, in the pixel arrangement structure of the OLED display of FIG. 6 according to an exemplary embodiment of the present invention, the first pixels 100, the second pixels 200, and the third pixels 300 have simple polygonal shapes such as an octagon, a hexagon, and a quadrangle. In consideration of the deposition process of the organic emission layer, which in one embodiment is a unique manufacturing feature of the OLED display, a center of one of the first pixels 100 is positioned at the center of the virtual square VS, a center of one of the second pixels 200 is positioned at the first vertex P1, and a center of one of the third pixels 300 is positioned at the second vertex P2 to both improve deposition reliability of the organic emission layer in the deposition process using the fine metal mask and improve an aperture of each of the first, second, and third pixels 100, 200, and 300.

[00109] That is, according to an exemplary embodiment of the present invention as illustrated in FIG. 6, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100 having an octagonal shape, a plurality of second pixels 200 having a hexagonal shape, and a plurality of third pixels 300 having a quadrilateral shape. In one or more embodiments, the shapes and arrangement of the first pixels 100, the second pixels 200, and the third pixels 300 improve the deposition reliability of the organic emission layer while also improving the aperture ratio of each of the first pixels 100, the second pixels, 200, and the third pixels 300.

[00110] While this invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims, and equivalents thereof.

BOE
Exhibit 1027 Page 667

<Description of some symbols>

first pixel 100, second pixels 200, third pixels 300

BOE
Exhibit 1027 Page 668

Electronic Acknowledgement Receipt

EFS ID:	21125223
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Bruce A. Wagar/Nathalie Shereston
Filer Authorized By:	Bruce A. Wagar
Attorney Docket Number:	72827/S1437
Receipt Date:	06-JAN-2015
Filing Date:	26-APR-2013
Time Stamp:	00:22:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	72827_Transmittal.pdf	187408 e19dd53d4472de9099c2e21034206350b620ccfe	no	2

Warnings:	
Information:	

2		72827_Amendment.pdf	387822 be9540e019c777a548bd48a548363263ff5bbbd4	yes	9

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	2
Specification	3	3
Claims	4	6
Drawings-only black and white line drawings	7	7
Applicant Arguments/Remarks Made in an Amendment	8	9

Warnings:					
Information:					
3	Drawings-only black and white line drawings	72827_ReplacementDrawings6.pdf	65081 4107c59f49841bb970b7ab8f0a21afdb2e4a68f8	no	6
Warnings:					
Information:					
4	Applicant Arguments/Remarks Made in an Amendment	72827_CompareSpecification.pdf	15323776 55220d3c8a3ad55bde0ec28189f5adaca997c09d	no	22
Warnings:					
Information:					
5	Applicant Arguments/Remarks Made in an Amendment	72827_SubstituteSpec.pdf	866048 dcfeca184297522f6fc5b0df9436dbbd0f1e7437	no	22
Warnings:					
Information:					
		Total Files Size (in bytes):	16830135		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
AMENDMENT TRANSMITTAL LETTER

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on January 5, 2015 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Nathalie Sherestin

Inventor : Sang-Shin Lee
Application No. : 13/872,018
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Confirmation No. 4833

Grp./Div. : 2691
Examiner : kwang- Su Yang

Docket No. : 72827/S1437

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
January 5, 2015

Commissioner:

Enclosed is an amendment to the above-identified application.

CLAIMS AS AMENDED							
	Claims Remaining After Amendment	Highest Number Previously Paid For	Number Extra Claims	Large Entity Rate	Small Entity Rate	Micro Entity Rate	FEE
Total Claims	14 -	* 20	= 0	0 x $80.00	$40.00	$20.00	$0.00
Independent Claims	1 -	** 3	= 0	0 x $420.00	$210.00	$105.00	$0.00
Multiple Dependent Claims***				$780.00	$390.00	$195.00	$0.00
						Total Additional Fee	$0.00
List Independent Claims: 1							
* If the "Highest Number of Total Claims Previously Paid For" is less than 20, enter "20" in this space ** If the "Highest Number of Independent Claims Previously Paid For" is less than 3, enter "3" in this space *** Pay this fee only when "Multiple Dependent Claims" are added for the first time							

__X__ No additional fee is required.

_____ A Petition for Extension of Time and the required fee are enclosed.

_____ Other enclosures:

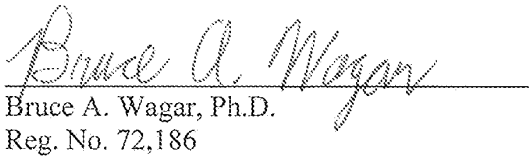
BOE
Exhibit 1027 Page 672

Amendment Transmittal Letter
Application No. 13/872,018

The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required by or to give effect to this paper to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,

CHRISTIE, PARKER & HALE, LLP

By 
Bruce A. Wagar, Ph.D.
Reg. No. 72,186
626/795-9900

BAW/nss

NSS PAS1334598.1-*-01/5/15 6:42 PM

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/872,018	Filing Date 04/26/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ 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).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	01/06/2015	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						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 number found in the appropriate box in column 1.

LIE
/VICTORIA BROWN/

This collection of information is required by 37 CFR 1.16. 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, 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.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE** **STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2002/0113195 A1	08-22-2002	Osada
		2009/0302331 A1	12-10-2009	Smith et al.
		2010/0171440 A1	07-08-2010	Satou et al.
		2011/0012820 A1	01-20-2011	Kim et al.
		2012/0086330 A1	04-12-2012	Umeda et al.
		2013/0037827 A1	02-14-2013	Levermore et al.

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		U.S. Office action dated November 7, 2014, for cross reference U.S. Patent application 13/614,197, (16 pages)
		U.S. Office action dated August 29, 2014, for cross reference U.S. Patent application 14/059,356, (18 pages)

DLG PAS1328199.1-*-11/19/14 8:37 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

JEJ/dg

Electronic Acknowledgement Receipt

EFS ID:	20752406
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Youg E. Jeon/Diane Goss
Filer Authorized By:	Jun-Youg E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	20-NOV-2014
Filing Date:	26-APR-2013
Time Stamp:	13:06:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827ids.pdf	111094 843173f415a3eff540814e1bba771d9caa7807ca	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3

Warnings:					
Information:					
2	Non Patent Literature	USOA4197-07NOV2014.pdf	656160 364e39729b1515ae38d21a8bf4c04a7e2f99f007	no	16
Warnings:					
Information:					
3	Non Patent Literature	USOA9356-29AUG2014.pdf	792911 981d3967a86b2dd2d6d725dca67c987cdfb4ba2f	no	18
Warnings:					
Information:					
		Total Files Size (in bytes):	1560165		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on November 20, 2014 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
November 20, 2014

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B listing the references that are known to applicant. Copies of each of the listed Other Documents references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of FORM PTO/SB/08A/B be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/dg
Enclosures: PTO/SB/08A/B, w/references

DLG PAS1328294.1-*-11/20/14 7:53 AM

BOE
Exhibit 1027 Page 679

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437	4833

23363 7590 11/05/2014
CHRISTIE, PARKER & HALE, LLP
PO BOX 29001
Glendale, CA 91209-9001

EXAMINER	
YANG, KWANG-SU	
ART UNIT	PAPER NUMBER
2691	

NOTIFICATION DATE	DELIVERY MODE
11/05/2014	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto@cph.com
pair_cph@firsttofile.com

Office Action Summary	Application No. 13/872,018	Applicant(s) LEE, SANG-SHIN	
	Examiner KWANG-SU YANG	Art Unit 2691	AIA (First Inventor to File) Status No

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04/26/2013*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ 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.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-13* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☐ Claim(s) _____ is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☒ Claim(s) *1-13* are subject to restriction and/or election requirement.

* If any claims have been determined allowable, 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.

Application Papers

10)☒ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *04/26/2013* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ 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)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Specification

2. This application is a continuation-in-part application of prior Application No. 13/614,197, filed on 09/13/2012. The continuation-in-part application needs repeat some substantial portion or all of the earlier nonprovisional application and add matter not disclosed in the said earlier nonprovisional application (MPEP 201.08). However, the instant application is missing some substantial portion or all of the earlier nonprovisional application. Applicant is required to include some substantial portion or all of the earlier nonprovisional application in the instant application.
The content of “BRIEF DESCPIPTION OF THE DRAWINGS” is missing.

Drawings

3. The Applicant is required to furnish drawings of the earlier nonprovisional application since the instant application is a continuation-in-part application.
Figure label such as Fig. 6 is missing in the instant application, including drawings of the said earlier nonprovisional application.

Election/Restrictions

4. This application contains claims directed to the following patentably distinct species of the claimed invention:

A. Species of Fig. 1 (Application 13/614,197);

B. Species of Fig. 2 (Application 13/614,197);

C. Species of Fig. 3 (Application No. 13/614,197);

D. Species of Fig. 4 (Application No. 13/614,197);

E. Species of Fig. 5 (Application No. 13/614,197); and

F. Species of Figure (Application No. 13/872,013).

The species are independent or distinct because claims to the different species recite the mutually exclusive characteristics of each species or grouping of species. Species A (Fig. 1; Application No. 13/614,197) teaches a pixel arrangement structure of the OLED display in which there are a plurality of first pixels, a plurality of second pixels, and a plurality of third pixels, each of the first pixels having the same quadrilateral shape (e.g., a square or rhombus), the second pixels being arranged diagonally with respect to the first pixels and having the same octagonal shape, and the third pixels being arranged diagonally with respect to the first pixels and having the same octagonal shape. Species B (Fig. 2; Application No. 13/614,197) teaches a pixel arrangement structure of the OLED display in which there are a plurality of first pixels, a plurality of second pixels, and a plurality of third pixels, each of the first pixels having the same quadrilateral shape (e.g., a parallelogram), and in which the second pixels have a larger area than the third pixels. Species C (Fig. 3; Application No. 13/614,197) teaches a pixel arrangement structure of the OLED display in which there are a plurality of first pixels, a plurality of second pixels, and a plurality of third pixels, each of the first pixels having the same quadrilateral shape (e.g., a parallelogram), and in which the second

pixels have a larger area than the third pixels and the second pixels and the third pixels may have polygon shapes (e.g., hexagonal or octagonal). Species D (Fig. 4; Application No. 13/614,197) teaches a pixel arrangement structure of the OLED display in which there are a plurality of first pixels, a plurality of second pixels, and a plurality of third pixels, each of the first pixels having the same quadrilateral shape (e.g., a parallelogram) and being symmetrical to each other, and in which the third pixels have a larger area than the second pixels. Species E (Fig. 5; Application No. 13/614,197) teaches a pixel arrangement structure of the OLED display in which there are a plurality of first pixels, a plurality of second pixels, and a plurality of third pixels, each of the first pixels having the same octagonal shape and being symmetrical to each other, and in which the second pixels have a larger area than the third pixels and the second pixels and the third pixels may have quadrilateral shapes (e.g., rhombus). Species F (Figure; Application No. 13/872,018) teaches a pixel arrangement structure of the OLED display in which there are a plurality of first pixels, a plurality of second pixels, and a plurality of third pixels, each of the first pixels having the same octagonal shape and being symmetrical to each other, and in which the second pixels have a larger area than the third pixels and the second pixels and the third pixels may have hexagon shape and quadrilateral shape (e.g., rhombus), respectively.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, there is no generic.

There is a search and/or examination burden for the patentably distinct species as set forth above. The species require a different field of search (e.g., searching different classes/subclasses or electronic resources, or employing different search queries); and/or the prior art applicable to one species would not likely be applicable to another species; and/or the species are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or a grouping of patentably indistinct species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species**, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Inquiry

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang-Su Yang whose telephone number is 571-270-7307. The examiner can normally be reached on Mon-Fri during 9:00am-6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on 571-272-7772. 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).

/KWANG-SU YANG/

Primary Examiner, Art Unit 2691

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)	**Attorney Docket Number**	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2012/0313844 A1	12-13-2012	Im et al.

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		JP 2004-192813	07-08-2004	Yamashita	Patent Abstracts of Japan
		JP 2011-076760	04-14-2011	Enkai et al.	Patent Abstracts of Japan
		WO 2005/067352 A1	07-21-2005	Chung et al.	

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		EPO Search Report dated July 9, 2014, for European Patent application 14155124.2, (8 pages)

DLG PAS1313566.1-*-08/18/14 8:19 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

JEJ/dg

Electronic Acknowledgement Receipt

EFS ID:	19891374
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Youg E. Jeon/Diane Goss
Filer Authorized By:	Jun-Youg E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	18-AUG-2014
Filing Date:	26-APR-2013
Time Stamp:	15:27:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827ids.pdf	109115 9e311545d21df5a93b869afa2ff29adf47b87664	yes	3

	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Foreign Reference	JP_813.pdf	344594 19bc3ceed380f5464dff38aa3722c501eae2d982	no	13
Warnings:					
Information:					
3	Foreign Reference	JP_760.pdf	524588 728d6fa0ca48114f26003423ad51a10b90b23c87	no	18
Warnings:					
Information:					
4	Foreign Reference	WO_352.pdf	493043 b2e72994dad969f525789a3bcf6e08da3ed7b6db	no	41
Warnings:					
Information:					
5	Non Patent Literature	EP_SearchRpt-7_9.pdf	341842 22afa0ef875c13ecb3b5418fb918091e96aa906c	no	8
Warnings:					
Information:					
		Total Files Size (in bytes):	1813182		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on August 18, 2014 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
August 18, 2014

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B listing the references that are known to applicant. Copies of each of the listed non-U.S. references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of FORM PTO/SB/08A/B be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/dg
Enclosures: PTO/SB/08A/B, w/references

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on August 15, 2014 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Signature

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Yang, Kwang-Su	
Docket No.	: 72827/S1437	

LETTER TO FILE CORRECTED APPLICATION DATA SHEET

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
August 15, 2014

Commissioner:

Upon review of the Application Data Sheet (ADS) (PTO/AIA/14) filed April 26, 2013, we became aware of a typographical error in the one of priority claims listed under Foreign Priority Information. Enclosed is an updated ADS which lists the correct claim of priority as reflected in the Cross-Reference to Related Applications paragraph of the application.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/frs
Enclosures
FRS PAS1313504.1-*-08/15/14 5:06 PM

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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	72827/P849
	Application Number	
Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	

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

Prefix	Given Name	Middle Name	Family Name	Suffix
	Sang-Shin		Lee	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Yongin-City	Country of Residence i	KR

Mailing Address of Inventor:

Address 1	95, Samsung 2 Ro, Giheung-Gu		
Address 2			
City	Yongin-City, Gyeonggi-Do	State/Province	
Postal Code		Country i	KR

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

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	23363		
Email Address	pto@cph.com	Add Email	Remove Email

Application Information:

Title of the Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY		
Attorney Docket Number	72827/P849	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	1	Suggested Figure for Publication (if any)	

PTO/AIA/14 (03-13)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	72827/P849
	Application Number	
Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	

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	23363		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this 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.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	13614197	2012-09-13

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
10-2012-0022967	KR	~~2013-03-06~~ 2012-03-06	

PTO/AIA/14 (03-13)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	72827/P849
	Application Number	
Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[j] (if applicable)
10-2013-0044993	KR	2013-04-23	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

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.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If 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 World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

Applicant 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.

PTO/AIA/14 (03-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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	72827/P849
	Application Number	
Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	

Applicant 1

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	SAMSUNG DISPLAY CO., LTD.		
Mailing Address Information For Applicant:			
Address 1	95, Samsung 2 Ro, Giheung-Gu		
Address 2			
City	Yongin-City, Gyeonggi-Do	**State/Province**	
Country KR		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Non-Applicant Assignee Information:

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

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section 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), as the patent application publication will include the name of the applicant(s).

If the Assignee is an Organization check here. ☐

PTO/AIA/14 (03-13)
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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	72827/P849
	Application Number	
Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country [i]		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button.

Signature:

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

Signature				Date (YYYY-MM-DD)	2014-08-15
First Name	Jun-Young E.	Last Name	Jeon	Registration Number	43693

Additional Signature may be generated within this form by selecting the Add button.

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.

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Electronic Acknowledgement Receipt

EFS ID:	19883627
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Youg E. Jeon/Felicia Sutphen
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	72827_LettertoCorrectADS.pdf	27122 7fa54274e36528477537ccca6faa717b298e87c7	no	1
Warnings:					
Information:					

2	Application Data Sheet	72827_CorrectedADS.pdf	220700 a7e97ccb795634 16e843bbce24a78887061edaec	no	6

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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.

New International Application Filed with the USPTO as a Receiving Office
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별첨 사본은 아래 출원의 원본과 동일함을 증명함.

This is to certify that the following application annexed hereto is a true copy from the records of the Korean Intellectual Property Office

출 원 번 호 : 10-2013-0044993
Application Number

출 원 년 월 일 : 2013년 04월 23일
Filing Date APR. 23, 2013

출 원 인 : 삼성디스플레이 주식회사
Applicant(s) Samsung Display Co., Ltd.

2014년 06월 05일

특 허 청
COMMISSIONER

제출 일자 : 2013-04-23

【서지사항】

【서류명】	특허출원서
【참조번호】	1667
【출원구분】	특허출원
【출원인】	
【명칭】	삼성디스플레이 주식회사
【출원인코드】	1-2012-016455-2
【대리인】	
【명칭】	팬코리아특허법인
【대리인코드】	9-2007-100081-9
【지정된변리사】	김동준, 김재만
【포괄위임등록번호】	2012-029467-3
【발명의 국문명칭】	유기 발광 표시 장치의 화소 배열 구조
【발명의 영문명칭】	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
【발명자】	
【성명】	이상신
【성명의 영문표기】	LEE, SANG-SHIN
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【출원일자】	2012.09.13

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제출 일자 : 2013-04-23

【증명서류】 우선권증명서류의 전자적 교환에 의한 첨부생략

【취지】 위와 같이 특허청장에게 제출합니다.

대리인 팬코리아특허법인 (서명 또는 인)

【수수료】

【출원료】	0	면	38,000 원
【가산출원료】	16	면	0 원
【우선권주장료】	1	건	18,000 원
【심사청구료】	0	항	0 원
【합계】	56,000 원		

【수수료 자동납부번호】 064-094949-04-013

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제출 일자 : 2013-04-23

【명세서】

【발명의 명칭】

유기 발광 표시 장치의 화소 배열 구조{PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY}

【기술분야】

<1> 본 발명은 유기 발광 표시 장치의 화소 배열 구조에 관한 것으로서, 보다 상세하게는 복수의 화소가 발광하여 이미지(image)를 표시하는 유기 발광 표시 장치의 화소 배열 구조에 관한 것이다.

【배경기술】

<2> 표시 장치는 이미지를 표시하는 장치로서, 최근 유기 발광 표시 장치(organic light emitting diode display)가 주목 받고 있다.

<3> 유기 발광 표시 장치는 자체 발광 특성을 가지며, 액정 표시 장치(liquid crystal display device)와 달리 별도의 광원을 필요로 하지 않으므로 두께와 무게를 줄일 수 있다. 또한, 유기 발광 표시 장치는 낮은 소비 전력, 높은 휘도 및 높은 반응 속도 등의 고품위 특성을 나타낸다.

<4> 일반적으로 유기 발광 표시 장치는 각각이 서로 다른 색의 빛을 발광하는 복수의 화소들을 포함하며, 이 복수의 화소들이 발광하여 이미지(image)를 표시한다.

<5> 여기서, 화소란 이미지를 표시하는 최소 단위를 의미하며, 이웃하는 화소 사이에는 각 화소를 구동하기 위한 게이트 라인, 데이터 라인, 구동 전원 라인 등의

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전원 라인 및 각 화소의 면적 또는 형태 등을 정의하기 위한 화소 정의막 등의 절연층 등이 위치할 수 있다.

<6> 종래의 유기 발광 표시 장치의 화소를 구성하는 유기 발광층은 파인메탈마스크(fine metal mask, FMM) 등의 마스크를 이용하여 증착 형성하였는데, 화소의 개구율 확보를 위해 이웃하는 화소 간의 갭(gap)을 짧게 형성할 경우 증착 신뢰도가 저하되는 문제점이 있었으며, 증착 신뢰도 향상을 위해 화소 간의 갭을 멀게 형성할 경우 화소의 개구율이 저하되는 문제점이 있었다.

【발명의 내용】

【해결하려는 과제】

<7> 본 발명의 일 실시예는 상술한 문제점을 해결하기 위한 것으로서, 화소의 개구율이 향상되는 동시에 화소 간의 갭이 효율적으로 설정된 유기 발광 표시 장치의 화소 배열 구조를 제공하고자 한다.

【과제의 해결 수단】

<8> 상술한 기술적 과제를 달성하기 위한 본 발명의 일 측면은 유기 발광 표시 장치의 화소 배열 구조에 있어서, 제1 화소, 상기 제1 화소와 이격되어 있으며, 상기 제1 화소의 중심점을 정사각형의 중심점으로 하는 가상의 정사각형의 제1 꼭지점에 중심점이 위치하는 제2 화소, 및 상기 제2 화소와 이격되어 있으며, 상기 가상의 정사각형의 상기 제1 꼭지점과 이웃하는 제2 꼭지점에 중심점이 위치하는 제3 화소를 포함하며, 상기 제1 화소, 상기 제2 화소 및 상기 제3 화소 각각은 다각형

형태를 가지는 유기 발광 표시 장치의 화소 배열 구조를 제공한다.

<9> 상기 제2 화소는 복수개이며, 상기 복수개의 제2 화소는 상기 제1 화소를 사이에 두고 상호 이격되어 있을 수 있다.

<10> 상기 제3 화소는 복수개이며, 상기 복수개의 제3 화소는 상기 제1 화소를 사이에 두고 상호 이격되어 있을 수 있다.

<11> 상기 제2 화소는 복수개이며, 상기 제3 화소는 복수개이며, 상기 복수개의 제2 화소 및 상기 복수개의 제3 화소 각각은 상기 가상의 정사각형 상에서 상기 제1 화소를 둘러싸고 있을 수 있다.

<12> 상기 제2 화소 및 상기 제3 화소는 상기 제1 화소 대비 큰 면적을 가질 수 있다.

<13> 상기 제1 화소는 팔각형 형태를 가지며, 상기 제2 화소 및 상기 제3 화소 중 어느 하나는 육각형 형태를 가지며, 다른 하나는 사각형 형태를 가질 수 있다.

<14> 상기 제1 화소는 복수개이며, 상기 복수개의 제1 화소 중 이웃하는 제1 화소 각각은 서로 대칭인 팔각형 형태를 가질 수 있다.

<15> 상기 제2 화소는 상기 제3 화소 대비 큰 면적을 가질 수 있다.

<16> 상기 제1 화소와 상기 제2 화소 사이의 거리 및 상기 제1 화소와 상기 제3 화소 사이의 거리 각각은 동일한 제1 길이를 가질 수 있다.

<17> 상기 제2 화소와 상기 제3 화소 사이의 거리는 제2 길이를 가지며, 이웃하는 상기 제1 화소 사이의 거리는 상기 제1 길이 및 상기 제2 길이 각각 대비 긴 제3

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길이를 가질 수 있다.

<18> 상기 제1 화소, 상기 제2 화소 및 상기 제3 화소 각각은 서로 다른 색의 빛을 발광할 수 있다.

<19> 상기 제1 화소는 녹색의 빛을 발광하며, 상기 제2 화소 및 상기 제3 화소 중 어느 하나는 청색의 빛을 발광하며 다른 하나는 적색의 빛을 발광할 수 있다.

【발명의 효과】

<20> 상술한 본 발명의 과제 해결 수단의 일부 실시예 중 하나에 의하면, 화소의 개구율이 향상되는 동시에 화소 간의 갭이 효율적으로 설정된 유기 발광 표시 장치의 화소 배열 구조가 제공된다.

【도면의 간단한 설명】

<21> 도 1은 본 발명의 일 실시예에 따른 유기 발광 표시 장치의 화소 배열 구조를 나타낸 도면이다.

【발명을 실시하기 위한 구체적인 내용】

<22> 이하, 첨부한 도면을 참고로 하여 본 발명의 여러 실시예들에 대하여 본 발명이 속하는 기술 분야에서 통상의 지식을 가진 자가 용이하게 실시할 수 있도록 상세히 설명한다. 본 발명은 여러 가지 상이한 형태로 구현될 수 있으며 여기에서 설명하는 실시예들에 한정되지 않는다.

<23> 본 발명을 명확하게 설명하기 위해서 설명과 관계없는 부분은 생략하였으며, 명세서 전체를 통하여 동일 또는 유사한 구성요소에 대해서는 동일한 참조 부호를

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붙이도록 한다.

<24> 또한, 도면에서 나타난 각 구성의 크기 및 두께는 설명의 편의를 위해 임의로 나타내었으므로, 본 발명이 반드시 도시된 바에 한정되지 않는다.

<25> 또한, 명세서 전체에서, 어떤 부분이 어떤 구성요소를 "포함" 한다고 할 때, 이는 특별히 반대되는 기재가 없는 한 다른 구성요소를 제외하는 것이 아니라 다른 구성요소를 더 포함할 수 있는 것을 의미한다.

<26> 이하, 도 1을 참조하여 본 발명의 일 실시예에 따른 유기 발광 표시 장치의 화소 배열 구조를 설명한다. 도 1은 유기 발광 표시 장치를 구성하는 화소들의 일부분을 개략적으로 나타낸 도면이다.

<27> 도 1은 본 발명의 일 실시예에 따른 유기 발광 표시 장치의 화소 배열 구조를 나타낸 도면이다.

<28> 도 1에 도시된 바와 같이, 본 발명이 일 실시예에 따른 유기 발광 표시 장치의 화소 배열 구조는 복수의 제1 화소(100), 복수의 제2 화소(200) 및 복수의 제3 화소(300)를 포함한다.

<29> 여기서, 화소(pixel)란 이미지를 표시하는 최소 단위를 의미한다.

<30> 제1 화소(100), 제2 화소(200) 및 제3 화소(300) 사이에는 각 화소를 구동하기 위한 게이트 라인, 데이터 라인, 구동 전원 라인 등의 전원 라인 및 각 화소를 정의하기 위한 화소 정의막 등의 절연층 등이 위치할 수 있으며, 제1 화소(100), 제2 화소(200) 및 제3 화소(300) 각각에 대응하여 애노드 전극, 유기 발광층 및 캐

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소드 전극을 포함하는 유기 발광 소자(organic light emitting diode)가 위치할 수 있다. 상기한 구성들은 종래에 공지된 기술들이므로 설명의 편의상 설명하지 않으며, 각 화소의 형태는 전원 라인들, 화소 정의막 또는 애노드 전극 등에 의해 정의될 수 있으나, 이에 한정되지는 않는다.

<31> 제1 화소(100)는 이웃한 제2 화소(200) 및 제3 화소 대비 작은 면적을 가지고 있으며, 다각형 형태를 가지고 있다. 제1 화소(100)는 다각형의 형태 중 팔각형의 형태를 가지고 있으나, 이에 한정되지 않고 삼각형, 사각형, 오각형, 육각형, 칠각형 등의 다각형 형태를 가질 수 있다. 제1 화소(100)는 복수개이며, 복수개의 제1 화소(100) 중 이웃하는 제1 화소(100) 각각은 서로 대칭인 팔각형 형태를 가지고 있다. 한편, 복수개의 제1 화소(100) 각각은 서로 동일한 팔각형 형태를 가지고 있을 수 있다. 복수개의 제1 화소(100) 각각은 상호 이격되어 가상의 제1 직선(VL1) 상에 배열되어 있다. 제1 화소(100)는 녹색의 빛을 발광하며, 녹색의 빛을 발광하는 유기 발광층을 포함할 수 있다. 한편, 제1 화소(100)는 청색, 적색 또는 백색 등의 다양한 색상의 빛을 발광하는 유기 발광층을 포함하여, 청색, 적색 또는 백색의 빛을 발광할 수 있다.

<32> 제1 화소(100)의 중심점을 정사각형의 중심점으로 하는 가상의 정사각형(VS)의 제1 꼭지점(P1)에 제2 화소(200)가 위치하고 있으며, 가상의 정사각형(VS)의 제2 꼭지점(P2)에 제3 화소(300)가 위치하고 있다.

<33> 제2 화소(200)는 제1 화소(100)와 이격되어 있으며, 가상의 정사각형(VS)의 제1 꼭지점(P1)에 중심점이 위치하고 있다. 제2 화소(200)는 이웃하는 제1 화소

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(100) 및 제3 화소(300) 각각 대비 더 큰 면적을 가지고 있으며, 다각형의 형태 중 육각형의 형태를 가지고 있다. 한편, 제2 화소(200)는 삼각형, 사각형, 오각형, 칠각형, 팔각형 등의 다각형 형태를 가질 수 있다. 제2 화소(200)는 복수개이며, 복수개의 제2 화소(200) 각각은 서로 동일한 육각형 형태를 가지고 있다. 복수개의 제2 화소(200)는 제1 화소(100)를 두고 상호 이격되어 있다. 제2 화소(200)는 청색의 빛을 발광하며, 청색의 빛을 발광하는 유기 발광층을 포함할 수 있다. 한편, 제2 화소(200)는 적색, 녹색 또는 백색 등의 다양한 색상의 빛을 발광하는 유기 발광층을 포함하여, 적색, 녹색 또는 백색의 빛을 발광할 수 있다.

<34> 제3 화소(300)는 제1 화소(100) 및 제2 화소(200)와 이격되어 있으며, 가상의 정사각형(VS)의 제1 꼭지점(P1)과 이웃하는 제2 꼭지점(P2)에 중심점이 위치하고 있다. 제3 화소(300)는 이웃하는 제1 화소(100) 대비 더 큰 면적을 가지고 있는 동시에 이웃하는 제2 화소(200) 대비 더 작은 면적을 가지고 있다. 제3 화소(300)는 다각형의 형태 중 사각형의 형태를 가지고 있다. 한편, 제3 화소(300)는 삼각형, 오각형, 육각형, 칠각형, 팔각형 등의 다각형 형태를 가질 수 있다. 제3 화소(300)는 복수개이며, 복수개의 제3 화소(300) 각각은 서로 동일한 사각형의 형태를 가지고 있다. 복수개의 제3 화소(300)는 제1 화소(100)를 두고 상호 이격되어 있다. 제3 화소(300)는 적색의 빛을 발광하며, 적색의 빛을 발광하는 유기 발광층을 포함할 수 있다. 한편, 제3 화소(300)는 청색, 녹색 또는 백색 등의 다양한 색상의 빛을 발광하는 유기 발광층을 포함하여, 청색, 녹색 또는 백색의 빛을 발광할 수 있다.

<35> 한편, 제2 화소(200) 및 제3 화소(300) 각각은 육각형 형태 및 사각형 형태를 가지나, 제2 화소(200) 및 제3 화소(300) 각각은 사각형 형태 및 육각형 형태 각각을 가질 수 있다. 즉, 제2 화소(200) 및 제3 화소(300) 중 어느 하나는 육각형 형태를 가지며, 다른 하나는 사각형 형태를 가질 수 있다.

<36> 또한, 제1 화소(100), 제2 화소(200), 제3 화소(300) 각각은 녹색, 청색, 적색 각각의 빛을 발광하나, 제1 화소(100), 제2 화소(200), 제3 화소(300) 각각은 서로 다른 색의 빛을 발광하거나 서로 동일한 색의 빛을 발광할 수 있다. 구체적으로, 제1 화소(100)는 녹색의 빛을 발광하며, 제2 화소(200) 및 제3 화소(300) 중 어느 하나는 청색의 빛을 발광하며 다른 하나는 적색의 빛을 발광할 수 있다.

<37> 복수개의 제3 화소(300) 및 복수개의 제2 화소(200) 각각은 가상의 제2 직선(VL2) 상에서 상호 교호적으로 배열되며, 이로 인해 제1 꼭지점(P1)에 중심점이 위치하는 복수개의 제2 화소(200) 및 제2 꼭지점(P2)에 중심점이 위치하는 복수개의 제3 화소(300) 각각은 가상의 정사각형(VS) 상에서 제1 화소(100)를 둘러싸고 있다.

<38> 이와 같이, 제1 화소(100)의 중심점을 정사각형의 중심점으로 하는 가상의 정사각형(VS)의 제1 꼭지점(P1)에 제2 화소(200)의 중심점이 위치하고, 제2 꼭지점(P2)에 제3 화소(300)의 중심점이 위치함으로써, 제1 꼭지점(P1)에 중심점이 위치하는 복수개의 제2 화소(200) 및 제2 꼭지점(P2)에 중심점이 위치하는 복수개의 제3 화소(300) 각각이 가상의 정사각형(VS) 상에서 제1 화소(100)를 둘러싸고 있는 동시에, 제1 화소(100), 제2 화소(200) 및 제3 화소(300) 각각이 다각형 형태를 가

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지기 때문에, 제1 화소(100)와 제2 화소(200) 사이의 거리 및 제1 화소(100)와 제3 화소(300) 화소 사이의 거리 각각은 동일한 제1 길이(L1)를 가지며, 이웃하는 제2 화소(200)와 제3 화소(300) 사이의 거리는 제1 길이(L1)와는 다른 제2 길이(L2)를 가지며, 이웃하는 제1 화소(100) 사이의 거리는 제1 길이(L1) 및 제2 길이(L2) 각각 대비 긴 제3 길이(L3)를 가지게 된다.

<39> 일례로, 제1 길이(L1)는 15um 내지 35um일 수 있고, 제2 길이(L2)는 20um 내지 45um일 수 있으며, 제3 길이(L3)는 25um 내지 65um일 수 있다.

<40> 이로 인해, 제1 화소(100)와 제2 화소(200)의 사이 및 제1 화소(100)와 제3 화소(300) 각각의 사이에는 제1 길이(L1)의 갭(gap)이 형성되는 동시에, 이웃하는 제1 화소(100) 사이에는 제1 길이(L1) 대비 긴 제3 길이(L3)의 갭이 형성됨으로써, 제1 화소(100), 제2 화소(200) 및 제3 화소(300) 각각에 포함된 녹색의 유기 발광층, 청색의 유기 발광층 및 적색의 유기 발광층 각각을 형성하는 파인메탈마스크를 이용한 증착 공정 시 증착 신뢰도가 향상된다.

<41> 또한, 복수의 제2 화소(200) 및 복수의 제3 화소(300) 각각이 제1 화소(100)를 가상의 정사각형(VS) 상에서 둘러싸도록 배열됨으로써, 제1 화소(100), 제2 화소(200) 및 제3 화소(300) 각각의 개구율을 향상시킬 수 있다. 이는 전체적인 유기 발광 표시 장치의 제조 시간 및 제조 비용을 절감하는 동시에 유기 발광 표시 장치가 표시하는 이미지의 품질을 향상시키는 요인으로서 작용된다.

<42> 또한, 본 발명의 일 실시예에 따른 유기 발광 표시 장치의 화소 배열 구조는 제1 화소(100), 제2 화소(200) 및 제3 화소(300) 중 다른 화소 대비 수명이 짧은

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청색의 빛을 발광하는 제2 화소(200)가 제1 화소(100) 및 제3 화소(300) 각각 대비 큰 면적을 가짐으로써, 전체적인 유기 발광 표시 장치의 수명이 저하되는 것이 억제된다. 즉, 수명이 향상된 유기 발광 표시 장치의 화소 배열 구조가 제공된다.

<43> 상술한 바와 같이, 본 발명의 일 실시예에 따른 유기 발광 표시 장치의 화소 배열 구조는 제1 화소(100), 제2 화소(200) 및 제3 화소(300) 각각이 단순히 팔각형, 육각형 및 사각형 각각 등의 다각형의 형태를 가지는 것이 아니라, 유기 발광 표시 장치의 고유의 제조 특성인 유기 발광층의 증착 공정을 고려하여, 파인메탈마스크를 이용한 증착 공정 시 유기 발광층의 증착 신뢰도를 향상시키는 동시에 제1 화소(100), 제2 화소(200) 및 제3 화소(300) 각각의 개구율을 향상시키기 위해, 가상의 정사각형(VS)의 중심점에 제1 화소(100)의 중심점을 위치시키고, 제1 꼭지점(P1)에 제2 화소(200)의 중심점을 위치시키고, 제2 꼭지점(P2)에 제3 화소(300)의 중심점을 위치시키는 것이다.

<44> 즉, 유기 발광층의 증착 신뢰도를 향상시키는 동시에 제1 화소(100), 제2 화소(200) 및 제3 화소(300) 각각의 개구율을 향상시키는 팔각형의 제1 화소(100), 육각형의 제2 화소(200) 및 사각형의 제3 화소(300)를 포함하는 유기 발광 표시 장치의 화소 배열 구조가 제공된다.

<45> 본 발명을 앞서 기재한 바에 따라 바람직한 실시예를 통해 설명하였지만, 본 발명은 이에 한정되지 않으며 다음에 기재하는 특허청구범위의 개념과 범위를 벗어나지 않는 한, 다양한 수정 및 변형이 가능하다는 것을 본 발명이 속하는 기술 분야에 종사하는 자들은 쉽게 이해할 것이다.

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【부호의 설명】

<46> 제1 화소(100), 제2 화소(200), 제3 화소(300)

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【특허청구범위】

【청구항 1】

유기 발광 표시 장치의 화소 배열 구조에 있어서,

제1 화소;

상기 제1 화소와 이격되어 있으며, 상기 제1 화소의 중심점을 정사각형의 중심점으로 하는 가상의 정사각형의 제1 꼭지점에 중심점이 위치하는 제2 화소; 및

상기 제2 화소와 이격되어 있으며, 상기 가상의 정사각형의 상기 제1 꼭지점과 이웃하는 제2 꼭지점에 중심점이 위치하는 제3 화소

를 포함하며,

상기 제1 화소, 상기 제2 화소 및 상기 제3 화소 각각은 다각형 형태를 가지는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 2】

제1항에서,

상기 제2 화소는 복수개이며,

상기 복수개의 제2 화소는 상기 제1 화소를 사이에 두고 상호 이격되어 있는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 3】

제1항에서,

상기 제3 화소는 복수개이며,

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상기 복수개의 제3 화소는 상기 제1 화소를 사이에 두고 상호 이격되어 있는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 4】

제1항에서,

상기 제2 화소는 복수개이며,

상기 제3 화소는 복수개이며,

상기 복수개의 제2 화소 및 상기 복수개의 제3 화소 각각은 상기 가상의 정사각형 상에서 상기 제1 화소를 둘러싸는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 5】

제4항에서,

상기 제2 화소 및 상기 제3 화소는 상기 제1 화소 대비 큰 면적을 가지는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 6】

제5항에서,

상기 제1 화소는 팔각형 형태를 가지며,

상기 제2 화소 및 상기 제3 화소 중 어느 하나는 육각형 형태를 가지며, 다른 하나는 사각형 형태를 가지는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 7】

제6항에서,

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상기 제1 화소는 복수개이며,

상기 복수개의 제1 화소 중 이웃하는 제1 화소 각각은 서로 대칭인 팔각형 형태를 가지는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 8】

제7항에서,

상기 제2 화소는 상기 제3 화소 대비 큰 면적을 가지는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 9】

제8항에서,

상기 제1 화소와 상기 제2 화소 사이의 거리 및 상기 제1 화소와 상기 제3 화소 사이의 거리 각각은 동일한 제1 길이를 가지는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 10】

제9항에서,

상기 제2 화소와 상기 제3 화소 사이의 거리는 제2 길이를 가지며,

이웃하는 상기 제1 화소 사이의 거리는 상기 제1 길이 및 상기 제2 길이 각각 대비 긴 제3 길이를 가지는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 11】

제1항 내지 제10항 중 어느 한 항에서,

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상기 제1 화소, 상기 제2 화소 및 상기 제3 화소 각각은 서로 다른 색의 빛을 발광하는 유기 발광 표시 장치의 화소 배열 구조.

【청구항 12】

제11항에서,

상기 제1 화소는 녹색의 빛을 발광하며,

상기 제2 화소 및 상기 제3 화소 중 어느 하나는 청색의 빛을 발광하며 다른 하나는 적색의 빛을 발광하는 유기 발광 표시 장치의 화소 배열 구조.

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제출 일자 : 2013-04-23

【요약서】

【요약】

유기 발광 표시 장치의 화소 배열 구조는 제1 화소, 상기 제1 화소와 이격되어 있으며, 상기 제1 화소의 중심점을 정사각형의 중심점으로 하는 가상의 정사각형의 제1 꼭지점에 중심점이 위치하는 제2 화소, 및 상기 제2 화소와 이격되어 있으며, 상기 가상의 정사각형의 상기 제1 꼭지점과 이웃하는 제2 꼭지점에 중심점이 위치하는 제3 화소를 포함하며, 상기 제1 화소, 상기 제2 화소 및 상기 제3 화소 각각은 다각형 형태를 가진다.

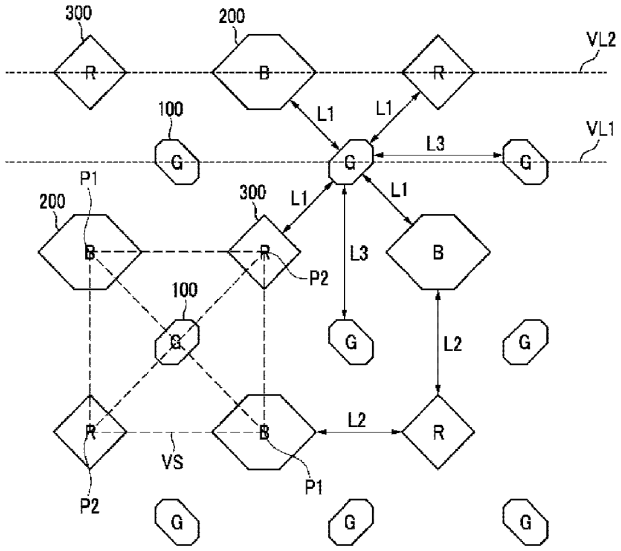
【대표도】

도 1

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Exhibit 1027 Page 722

【도면】

【도 1】



BOE
Exhibit 1027 Page 723

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE** **STATEMENT BY APPLICANT** (use as many sheets as necessary)	**Attorney Docket Number**	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		KR 10-0742370 B1	07-24-2007	Kang et al.	*Korean Patent Abstracts

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		*Korean Patent Abstracts for Korean Publication 1020070055908 dated May 31, 2007, corresponding to Korean Patent 10-0742370 dated July 24, 2007, listed above.

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EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

JEJ/dg

Electronic Acknowledgement Receipt

EFS ID:	19003517
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Youg E. Jeon/Diane Goss
Filer Authorized By:	Jun-Youg E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	12-MAY-2014
Filing Date:	26-APR-2013
Time Stamp:	14:46:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

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1		72827ids.pdf	107950 24adab6cc774b90bae87943a3a8e7e63a4c6498d	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3
Warnings:			
Information:			

2		KR_370.pdf	244339 691814755308615962 0debd2444ae5d41c9b7b71	yes	14

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Other Reference-Patent/App/Search documents	1	1
	Foreign Reference	2	14
Warnings:			
Information:			
	Total Files Size (in bytes):	352289	

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New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on May 12, 2014 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
May 12, 2014

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B listing a reference that is known to applicant. A copy of the listed reference is enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed reference be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of FORM PTO/SB/08A/B be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/dg
Enclosures: PTO/SB/08A/B, w/references

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/872,018	04/26/2013	Sang-Shin Lee	72827/S1437

CONFIRMATION NO. 4833

23363
CHRISTIE, PARKER & HALE, LLP
PO BOX 29001
Glendale, CA 91209-9001

PUBLICATION NOTICE

OC000000067136206

Title:PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Publication No.US-2014-0071030-A1
Publication Date:03/13/2014

NOTICE OF PUBLICATION OF APPLICATION

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.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2691
	Examiner Name	Kwang-Su Yang

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2008/0001525 A1	01-03-2008	Chao et al.

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		Extended European Search Report dated December 20, 2013, for corresponding European Patent Application No. 13178648.5 (9 pages)

NRD PAS1284310.1-*-02/25/14 4:04 PM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Exhibit 1027 Page 730

Electronic Acknowledgement Receipt

EFS ID:	18306441
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Youg E. Jeon/Nirja Dalal
Filer Authorized By:	Jun-Youg E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	26-FEB-2014
Filing Date:	26-APR-2013
Time Stamp:	17:27:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827_IDS.PDF	66968 d84c4798c55bbf5955dd3ea60eca520be901173b	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3

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Information:					
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New Applications Under 35 U.S.C. 111
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.

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PATENT

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Signature

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2691	
Examiner	: Kwang-Su Yang	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
February 26, 2014

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B listing the references that are known to applicant. Copies of each of the listed references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

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Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/nrd
Enclosures: PTO/SB/08A/B, w/references

NRD PAS1284307.1-*-02/25/14 3:56 PM

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE** **STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2621
	Examiner Name	Amr A. Awad

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		8,350,468 B2	01-08-2013	Ko et al.

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.

DLG PAS1271582.1-*-12/9/13 10:19 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

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Exhibit 1027 Page 735

Electronic Acknowledgement Receipt

EFS ID:	17609045
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Youg E. Jeon/Diane Goss
Filer Authorized By:	Jun-Youg E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	09-DEC-2013
Filing Date:	26-APR-2013
Time Stamp:	18:39:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

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	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	2
	Information Disclosure Statement (IDS) Form (SB08)	3	3
Warnings:			
Information:			
	Total Files Size (in bytes):	103491	

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.

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New International Application Filed with the USPTO as a Receiving Office
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PATENT

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Diane L. Goss

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2621	
Examiner	: Amr A. Awad	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
December 9, 2013

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B listing a reference that is known to applicant. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

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Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/dg
Enclosures: PTO/SB/08A/B, w/reference

DLG PAS1271585.1-*-12/9/13 10:21 AM

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE** **STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/S1437
	Application Number	13/872,018
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	2677
	Examiner Name	To be determined

U.S. PATENT DOCUMENTS				
EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE
		2002/0015110 A1	02-07-2002	Brown Elliott
		2002/0070909 A1	06-13-2002	Asano et al.
		2004/0108818 A1	06-10-2004	Cok et al.
		2005/0001542 A1	01-06-2005	Kiguchi

FOREIGN PATENT DOCUMENTS					
EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		GB 2 437 110 A	10-17-2007	Smith et al.	Patent Abstracts of Japan
		JP 2000-235891	08-29-2000	Fujimori et al.	Patent Abstracts of Japan
		JP 2006-309182	11-09-2006	Koyama et al.	Patent Abstracts of Japan
		JP 2008-015521	01-24-2008	Chao et al.	Patent Abstracts of Japan

OTHER DOCUMENTS		
EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		EPO Search Report dated July 8, 2013, for corresponding European Patent application 13157562.3, (6 pages)

DLG PAS1254998.1-*-08/30/13 11:00 AM

EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

JEJ/dg

Electronic Acknowledgement Receipt

EFS ID:	16738360
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Youg E. Jeon/Diane Goss
Filer Authorized By:	Jun-Youg E. Jeon
Attorney Docket Number:	72827/S1437
Receipt Date:	30-AUG-2013
Filing Date:	26-APR-2013
Time Stamp:	17:38:29
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		72827ids.pdf	90528 f49889a2d55d9ce74dbbb47a1002e64ff44908e4	yes	3

	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Transmittal Letter		1	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
Warnings:					
Information:					
2	Foreign Reference	GB_110.pdf	929823 fa309d79bc18e2b9f200eaebb66cca41e5398b2d	no	29
Warnings:					
Information:					
3	Foreign Reference	JP_891.pdf	761296 5aeb151ab3da80ca5ed22307bbc3c3342fcceae1	no	11
Warnings:					
Information:					
4	Foreign Reference	JP_182.pdf	929083 0f13518a13163619d39112e7f0714c4326789f46	no	18
Warnings:					
Information:					
5	Foreign Reference	JP_521.pdf	1108175 5fd3e9c33ce220673dde42373cd5f2d5f7d0537c	no	20
Warnings:					
Information:					
6	Non Patent Literature	EP_SearchRpt.pdf	1025657 5f94143b5e74656a318f927ffd2b37492904d894	no	6
Warnings:					
Information:					
		Total Files Size (in bytes):	4844562		

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.

New Applications Under 35 U.S.C. 111
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.

National Stage of an International Application under 35 U.S.C. 371
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.

New International Application Filed with the USPTO as a Receiving Office
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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on August 30, 2013 at or before 11:59 p.m. Pacific Time under the Rules of 37 CFR § 1.8.

Diane L. Goss

Inventor	: Sang-Shin Lee	Confirmation No. 4833
Application No.	: 13/872,018	
Filed	: April 26, 2013	
Title	: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	
Grp./Div.	: 2677	
Examiner	: To be determined	
Docket No.	: 72827/S1437	

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
August 30, 2013

Commissioner:

In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B listing the references that are known to applicant. Copies of each of the listed non-U.S. references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of FORM PTO/SB/08A/B be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Application No.: 13/872,018

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/dg
Enclosures: PTO/SB/08A/B, w/references

DLG PAS1255005.1-*-08/30/13 11:03 AM

BOE
Exhibit 1027 Page 745

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/872,018	04/26/2013	Sang-Shin Lee	72827/P849

CONFIRMATION NO. 4833

23363
CHRISTIE, PARKER & HALE, LLP
PO BOX 29001
Glendale, CA 91209-9001

POA ACCEPTANCE LETTER

OC000000061549445

Date Mailed: 06/06/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/26/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/eruga/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/872,018

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
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), (i), 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(i))	13 minus 20 =	*			OR	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
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1600

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	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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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/872,018	04/26/2013	2677	1600	72827/P849	13	1

CONFIRMATION NO. 4833

23363
CHRISTIE, PARKER & HALE, LLP
PO BOX 29001
Glendale, CA 91209-9001

FILING RECEIPT

OC000000061549416

Date Mailed: 06/06/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Sang-Shin Lee, Yongin-City, KOREA, REPUBLIC OF;

Applicant(s)

SAMSUNG DISPLAY CO., LTD., Yongin-City, KOREA, REPUBLIC OF

Assignment For Published Patent Application

SAMSUNG DISPLAY CO., LTD., Yongin-City, KOREA, REPUBLIC OF

Power of Attorney: The patent practitioners associated with Customer Number 23363

Domestic Priority data as claimed by applicant

This application is a CIP of 13/614,197 09/13/2012

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
REPUBLIC OF KOREA 10-2012-0022967 03/06/2013
REPUBLIC OF KOREA 10-2013-0044993 04/23/2013

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

Request to Retrieve - This application either claims priority to one or more applications filed in an intellectual property Office that participates in the Priority Document Exchange (PDX) program or contains a proper **Request to Retrieve Electronic Priority Application(s)** (PTO/SB/38 or its equivalent). Consequently, the USPTO will attempt to electronically retrieve these priority documents.

If Required, Foreign Filing License Granted: 05/28/2013

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/872,018**

Projected Publication Date: 03/13/2014

Non-Publication Request: No

Early Publication Request: No

Title

PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Preliminary Class

345

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

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INVENTOR'S DECLARATION AND ASSIGNMENT FOR PATENT APPLICATION PATENT

Title of Invention: PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Docket No.: 72827/P849

INVENTOR'S DECLARATION

As a below named inventor, I hereby declare that:

This declaration is directed to the attached application unless the following is checked:

___ United States Application or PCT International Application Number _____ filed on _____.

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

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

I have reviewed and understand the contents of the above-identified application, including the claims.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I 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.

ASSIGNMENT

In consideration of good and valuable consideration, the receipt of which is hereby acknowledged, the undersigned,

(1) Sang Shin Lee

HEREBY SELL(S), ASSIGN(S) AND TRANSFER(S) TO

(2) SAMSUNG DISPLAY CO., LTD.

having a place of business at

(3) 95, Samsung 2 Ro, Giheung-Gu, Yongin-City, Gyeonggi-Do, Korea

(hereinafter called "ASSIGNEE") the entire right, title and interest in and to any and all improvements which are disclosed in the application for United States Letters Patent entitled

윤수연/12408633/국내 본사IIP팀(디스플레이쿼)/1190166154/20130426170700 387071366963477

INVENTOR'S DECLARATION AND ASSIGNMENT FOR PATENT APPLICATION

Docket No. 72827/P849

(4) . PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

which application executed on even date herewith or was

(a) executed on (5a): April 26, 2013 ;

(b) filed on (5b): _____ ,

Application No.: _____ ;

(CHRISTIE, PARKER & HALE, LLP, P.O. Box 29001, Glendale, CA 91209-9001) is hereby authorized to insert in (b) the specified data, when known.

including any and all United States Patents which may be granted on said application, and any and all extensions, divisions, reissues, substitutes, renewals or continuations of said application and patents, and the right to all benefits under all international conventions for the protection of industrial property and applications for said improvements.

It is hereby authorized and requested that the Commissioner of Patents issue any and all of said Letters Patent, when granted, to said ASSIGNEE, its assigns or its successors in interest or its designee.

Upon said consideration, it is further agreed that, when requested, without charge to but at the expense of said ASSIGNEE, the undersigned will execute all divisional, continuing, substitute, renewal, and reissue patent applications; execute all rightful other papers; and generally do everything possible which said ASSIGNEE shall consider desirable for aiding in securing and maintaining patent protection as provided herein.

Sang Shin Lee
Legal Name of Inventor

April 26, 2013
Date

Sang Shin Lee
Signature

WITNESSES:

_____

_____

AM PAS1232027.1-*-04/24/13 10:03 AM

윤수연/12408633/국내 본사||P팀(디스플레이쪽)/1190166154/20130426170700

3870713689634477

FORM PTO/SB/08A/B (10-01) Substitute for PTO-1449A/B **INFORMATION DISCLOSURE** **STATEMENT BY APPLICANT** (use as many sheets as necessary)		
	Attorney Docket Number	72827/P849
	Application Number	To Be Determined
	Filing Date	April 26, 2013
	Inventor(s)	Sang-Shin Lee
	Group Art Unit	To Be Determined
	Examiner Name	To Be Determined

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	DOCUMENT NUMBER Number - Kind Code[2] (If Known)	PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE

FOREIGN PATENT DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Foreign Patent Document Country Code[3] - Number[4] - Kind Code[5] (If Known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	T[6] (✓)
		KR 10-0807524 B1	02-26-2008	Choo et al.	Korean Patent Abstracts for KR 10-2003-0031207 A
		KR 10-2009-0017910 A	02-19-2009	Park et al.	Korean Patent Abstracts
		KR 10-2011-0023996 A	03-09-2011	Kim et al.	Korean Patent Abstracts
		KR 10-2011-0106565 A	09-29-2011	Kim et al.	Korean Patent Abstracts
		KR 10-2012-0022967 A	03-12-2012	Nakano et al.	Korean Patent Abstracts

OTHER DOCUMENTS

EXAMINER INITIALS	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article, title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
		Korean Patent Abstracts of Korean Publication No. 10-2003-0031207 A, published April 21, 2003, which corresponds to KR 10-0807524 B1, 2 pages

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EXAMINER SIGNATURE		DATE CONSIDERED	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.pto.gov or MPEP 901.4. [3]Enter Office that issued the document, by the two-letter code (WIPO standard ST.3). [4]For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English Language Translation is attached.

Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

JEJ/frs

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Filer:	Jun-Youg E. Jeon/Felicia Sutphen
Attorney Docket Number:	72827/P849

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

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:	15629688
Application Number:	13872018
International Application Number:	
Confirmation Number:	4833
Title of Invention:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
First Named Inventor/Applicant Name:	Sang-Shin Lee
Customer Number:	23363
Filer:	Jun-Youg E. Jeon/Felicia Sutphen
Filer Authorized By:	Jun-Youg E. Jeon
Attorney Docket Number:	72827/P849
Receipt Date:	26-APR-2013
Filing Date:	
Time Stamp:	21:03:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1600
RAM confirmation Number	8577
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Transmittal Letter	72827_Transmittal.pdf	121421 9b750207b576e6b639bbe73145c4e1d0a1c9d5b4	no	3
Warnings:					
Information:					
2	Application Data Sheet	72827_ADS.pdf	1503391 c6d387c438bb1b38fd0ad032d798464e4f4ba6f0	no	6
Warnings:					
Information:					
3		72827_Spec.pdf	123415 e13a5a6008f6dd146f4be31cf8d428b5de966c92	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	11
	Claims	12	14
	Abstract	15	15

Warnings:					
Information:					
4	Drawings-only black and white line drawings	72827_Drawing.pdf	12479 80c4bbb6d2461385631 9b5977fdbc55a8bf14347	no	1
Warnings:					
Information:					
5	Oath or Declaration filed	72827_Dec.pdf	896830 febbd186e39c69b4e6393652d96728a44288a51f	no	2
Warnings:					
Information:					
6	Power of Attorney	72827_POA.pdf	34082 887a838d310eea1670116cad59b3bb191dfeb855	no	2
Warnings:					
Information:					
7		72827_IDS.pdf	52262 31f0960c13694b812c7bbaa7a298919c278755aa	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**

	Transmittal Letter		1		2
	Information Disclosure Statement (IDS) Form (SB08)		3		3
Warnings:					
Information:					
8	Foreign Reference	KR_524.pdf	356904 f98f9d2f000bbd74bb3e120fb8531f07b27d0ed8	no	21
Warnings:					
Information:					
9	Foreign Reference	KR_910.pdf	210104 445e303a89c0c73ed672626ba2f831aef6789e5c	no	13
Warnings:					
Information:					
10	Foreign Reference	KR_996.pdf	189762 9900f9778b7bbba9c50850ece342442711433fb8	no	12
Warnings:					
Information:					
11	Foreign Reference	KR_565.pdf	300057 9f0fa17c2242f09d5f9eab6c39836cb619e80cec	no	18
Warnings:					
Information:					
12	Foreign Reference	KR_967.pdf	882965 5a44f46e7c9a9cf18ae3dc42f387a6321448f207	no	37
Warnings:					
Information:					
13	Fee Worksheet (SB06)	fee-info.pdf	33156 cafa561d913b8715d48bdcfc6f1c9650bcf92ac6	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	4716828		

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New Applications Under 35 U.S.C. 111

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.

National Stage of an International Application under 35 U.S.C. 371

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.

New International Application Filed with the USPTO as a Receiving Office

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.

UTILITY PATENT APPLICATION TRANSMITTAL
(Only for new nonprovisional applications under 37 CFR 1.53(b))

I hereby certify that this correspondence is being electronically filed with the United States Patent and Trademark Office on April 26, 2013 at or before 11:59 p.m. Eastern Standard Time under the Rules of 37 CFR § 1.10.

Signature

Docket No. : 72827/P849
Inventor(s) : Sang-Shin Lee
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

ADDRESS TO: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

April 26, 2013

1. __X__ **FEE TRANSMITTAL FORM**

2. **IF A CONTINUING APPLICATION**
__X__ This application is a continuation-in-part of patent application No. 13/614,197.

Prior application information: Examiner Amr A. Awad; Group Art Unit: 2691.

_____ This application claims the benefit of Provisional Application No. _____ pursuant to 35 U.S.C. §119(e) and 37 CFR §1.78(a)(4).

3. **APPLICATION COMPRISED OF**

Specification
__15__ Specification, claims and Abstract (total pages)

Drawings
__1__ Sheets of formal drawing(s)

Inventor's Declaration(s)
_____ Executed Declaration (new or copy from a prior application (37 CFR 1.63(d)) (for continuation and divisional)
__X__ Executed Declaration/Assignment (new or copy from a prior application (37 CFR 1.63(d)) (for continuation and divisional)

Power of Attorney by Applicant(s)
__X__ Executed (new or copy from a prior application (37 CFR 1.63(d)) (for continuation and divisional) with transmittal

Application Data Sheet
__X__ Newly executed ADS
_____ Unexecuted ADS

4. _____ **Microfiche Computer Program** *(Appendix)*

UTILITY PATENT APPLICATION TRANSMITTAL
(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.: 72827/P849

5. _____ **Nucleotide and/or Amino Acid Sequence Submission** *(if applicable, all necessary)*
   _____ Computer Readable Copy
   _____ Paper Copy (identical to computer copy)
   _____ Statement verifying identity of above copies

6. **APPLICANT(S) STATUS UNDER 37 CFR §1.27**
   _____ Applicant(s) and any others associated with it/them under §1.27(a) are a SMALL ENTITY

7. **ALSO ENCLOSED ARE**
   _____ Request and Certificate under 35 U.S.C. §122(b)(2)(B)(i) **Request for Non-Publication)**
   _____ Preliminary Amendment
   _____ Includes "Cross-Reference to Related Applications"
   _____ A Petition for Extension of Time for the parent application and the required fee are being filed concurrently herewith.
   _____ This application is owned by _____ pursuant to an Assignment recorded at Reel _____, Frame _____
   __X__ Information Disclosure Statement (IDS)/PTO/SB/08A/B
   __X__ Copies of IDS Citations
   _____ Certified copy of Priority Document(s) *(paper filing only, if foreign priority is claimed)*
   _____ English Translation Document *(if applicable)*
   _____ Return Receipt Postcard (MPEP 503) (should be specifically itemized).
   _____ Other: _____

8. **DIRECT ALL CORRESPONDENCE TO: CUSTOMER NUMBER 23363**

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

CHRISTIE, PARKER & HALE, LLP, P.O. BOX 29001, GLENDALE, CA 91209-9001

FEE TRANSMITTAL
UTILITY PATENT APPLICATION

DATE: April 26, 2013

Docket No. : 72827/P849 Duplicate __
Inventor(s) : Sang-Shin Lee
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

FEE CALCULATION

CLAIMS AS FILED						
	Number Filed	Number Extra	Large Entity Rate	Small Entity Rate	Micro Entity Rate	Fee
Total Claims	13 – 20	= 0	0 x $80.00	$40.00	$20.00	$0.00
Independent Claims	1 – 3	= 0	0 x $420.00	$210.00	$105.00	$0.00
Multiple-Dependent Claims Fee			$780.00	$390.00	$195.00	$0.00

BASIC FILING, SEARCH, AND EXAMINATION FEES				
	Large Entity Rate	Small Entity Rate	Micro Entity Rate	Fee
Basic Filing Fee	$280.00	$$70.00	$70.00	$280.00
Search Fee	$600.00	$300.00	$150.00	$600.00
Examination Fee	$720.00	$360.00	$180.00	$720.00

APPLICATION SIZE FEE							
EFS Paper Size Equivalent	Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof (round up to whole number)	Large Entity Rate	Small Entity Rate	Micro Entity Rate	Fee
16 *.75	= 12 – 100	= 0/50	= 0	0 x $400.00	$200.00	$100.00	$0.00

OTHER				
	Large Entity Rate	Small Entity Rate	Micro Entity Rate	Fee
Late Submission of Oath/Declaration Fee	$140.00	$70.00	$35.00	$0.00
Non-Electronic Filing Fee	$400.00	$200.00	$200.00	$0.00
			TOTAL AMOUNT OF FEES	$1,600.00
List Independent Claims: 1				

METHOD OF PAYMENT

__X__ Submitted herewith is the fee of $1,600.00.

__X__ The Commissioner is hereby authorized to charge any fees under 37 CFR 1.16 and 1.17 which may be required during the **entire pendency** of the application to Deposit Account No. 03-1728. Please show our docket number with any charge or credit to our Deposit Account.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

JEJ/frs

PTO/AIA/14 (03-13)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	72827/P849
	Application Number	
Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	

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

Prefix	Given Name	Middle Name	Family Name	Suffix
	Sang-Shin		Lee	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Yongin-City	Country of Residence i	KR

Mailing Address of Inventor:

Address 1	95, Samsung 2 Ro, Giheung-Gu		
Address 2			
City	Yongin-City, Gyeonggi-Do	**State/Province**	
Postal Code		**Country** i	KR

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

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	23363		
Email Address	pto@cph.com	Add Email	Remove Email

Application Information:

Title of the Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY		
Attorney Docket Number	72827/P849	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	1	**Suggested Figure for Publication (if any)**	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	72827/P849
	Application Number	
Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	

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	23363		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this 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.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	13614197	2012-09-13

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) [i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code [i] (if applicable)
10-2012-0022967	KR	2013-03-06	

PTO/AIA/14 (03-13)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	72827/P849
	Application Number	
Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	

Remove

Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code [i] (if applicable)
10-2013-0044993	KR	2013-04-23	

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

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.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If 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 World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant 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.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	72827/P849
	Application Number	
Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	

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. [X]

Organization Name	SAMSUNG DISPLAY CO., LTD.		
Mailing Address Information:			
Address 1	95, Samsung 2 Ro, Giheung-Gu		
Address 2			
City	Yongin-City, Gyeonggi-Do	**State/Province**	
Country [i]	KR	Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Non-Applicant Assignee Information:

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

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section 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), as the patent application publication will include the name of the applicant(s).

Remove

If the Assignee is an Organization check here. [ ]

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	72827/P849
	Application Number	
Title of Invention	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY	

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:

Address 1	
Address 2	

City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

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

Signature	/Jun-Young E. Jeon/			Date (YYYY-MM-DD)	2013-04-26
First Name	Jun-Young E.	Last Name	Jeon	Registration Number	43693

Additional Signature may be generated within this form by selecting the Add button. Add

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.

1 72827/P849

PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

5

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation in part of U.S. Application No. 13/614,197, filed September 13, 2012, which claims priority to and the benefit of Korean Patent Application No. 10-2012-0022967, filed in the Korean Intellectual Property Office on
10 March 6, 2012. This application also claims priority to and the benefit of Korean Patent Application No. 10-2013-0044993, filed in the Korean Intellectual Property Office on April 23, 2013. The entire contents of all of these are incorporated herein by reference.

BACKGROUND

15 ### 1. Field

[0002] Aspects of embodiments of the present invention relate generally to a pixel arrangement structure for an organic light emitting diode (OLED) display.

2. Description of the Related Art

20 **[0003]** A display device is a device that displays an image. Recently, an OLED display has been drawing attention.

[0004] The OLED display has a self-luminous characteristic. Because the OLED display does not need a separate light source, unlike a liquid crystal display, it can have a relatively smaller thickness and weight than liquid crystal displays. In addition, the
25 OLED display exhibits high-quality characteristics such as low power consumption, high luminance, high response speed, etc.

[0005] In general, the OLED display includes a plurality of pixels for emitting light of different colors. The plurality of pixels emit light to display an image.

BOE
Exhibit 1027 Page 769

[0006] Here, the pixel refers to a minimum unit for displaying the images. For instance, there may be a gate line, a data line, and a power line such as a driving power line to drive each pixel. In addition, there may be an insulation layer such as a pixel definition layer to define an area and a shape of each pixel. Further, each pixel may be positioned between its neighboring pixels.

[0007] An organic emission layer included in the pixel of an OLED display may be deposited and formed by using a mask such as a fine metal mask (FMM). When reducing a gap between the neighboring pixels to obtain a high aperture ratio of the pixels, deposition reliability may be deteriorated. On the other hand, when increasing the gap between the pixels to improve the deposition reliability, the aperture ratio of the pixels may be deteriorated.

[0008] The above information disclosed in this Background section is only for enhancement of understanding of the background of the invention and therefore it may contain information that does not form the prior art that is already known in this country to a person of ordinary skill in the art.

SUMMARY

[0009] Aspects of embodiments of the present invention relate generally to a pixel arrangement structure for an OLED display. More particularly, aspects of embodiments of the present invention relate to a pixel arrangement structure of an OLED display that displays an image by emitting light through a plurality of pixels.

[0010] An exemplary embodiment of the present invention provides a pixel arrangement structure for an OLED display having an improved aperture ratio of each of the pixels while efficiently setting up gaps between the pixels.

[0011] According to an exemplary embodiment of the present invention, a pixel arrangement structure of an organic light emitting diode (OLED) display is provided. The pixel arrangement structure includes: a first pixel having a center coinciding with a

center of a virtual square; a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square. The first pixel, the second pixel, and the third pixel have polygonal shapes.

[0012] In one embodiment, the second pixel includes a pair of second pixels, and the second pixels are separated from each other by the first pixel.

[0013] In one embodiment, the third pixel includes a pair of third pixels, and the third pixels are separated from each other by the first pixel.

[0014] In one embodiment, the second pixel includes a pair of second pixels, the third pixel includes a pair of third pixels, and the second pixels and the third pixels enclose the first pixel in the virtual square.

[0015] In one embodiment, each of the second pixels and the third pixels is larger in area than the first pixel.

[0016] In one embodiment, the first pixel has an octagonal shape, and at least one of the second pixel or the third pixel has an octagonal shape.

[0017] In one embodiment, the first pixel has an octagonal shape, and one of the second pixel or the third pixel has a hexagonal shape and an other of the second pixel or the third pixel has a quadrilateral shape.

[0018] In one embodiment, the virtual square includes a pair of virtual squares sharing a common side, the first pixel includes a pair of first pixels having centers respectively coinciding with centers of the virtual squares, and the first pixels have octagonal shapes that are symmetrical to each other.

[0019] In one embodiment, each of the second pixels is larger in area than each of the third pixels.

[0020] In one embodiment, a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length.

[0021] In one embodiment, the virtual square includes a pair of virtual squares sharing a common side, the first pixel includes a pair of first pixels having centers respectively coinciding with centers of the virtual squares, a distance between each of the second pixels and the third pixels is a same second length, and a distance between the first pixels is a third length that is longer than the first length and the second length.

[0022] In one embodiment, the first pixel, the second pixel, and the third pixel are configured to emit different color light.

[0023] In one embodiment, the first pixel is configured to emit green light, one of the second pixel or the third pixel is configured to emit blue light, and an other of the second pixel or the third pixel is configured to emit red light.

[0024] According to an exemplary embodiment of the present invention, the pixel arrangement structure of the OLED display improves the aperture ratio of the pixels while efficiently setting up the gaps between the pixels.

BRIEF DESCRIPTION OF THE DRAWING

[0025] The drawing is a view of a pixel arrangement structure of an OLED display according to an exemplary embodiment of the present invention.

DETAILED DESCRIPTION

[0026] Several exemplary embodiments according to the present invention are described hereinafter in detail with reference to the accompanying drawing to allow one of ordinary skill in the art to practice the invention without undue experimentation. The present invention can be embodied in several different forms, and is not limited to the exemplary embodiments that are described herein.

[0027] In order to clarify the description of embodiments of the present invention, parts that are not related to the invention may be omitted. In addition, the same

elements or equivalents are referred to with the same reference numerals throughout the specification.

[0028] Further, since sizes and thicknesses of constituent members shown in the accompanying drawing may be arbitrarily given for better understanding and ease of description, the present invention is not limited to the illustrated sizes and thicknesses.

[0029] In addition, unless explicitly described to the contrary, the word "comprise" and variations such as "comprises" or "comprising" will be understood to imply the inclusion of stated elements but not the exclusion of any other elements.

[0030] Hereinafter, a pixel arrangement structure (or pixel arrangement) of an OLED display according to an exemplary embodiment will be described with reference to the drawing. The drawing is a view schematically showing a portion of pixels forming an OLED display.

[0031] The drawing shows a pixel arrangement structure of an OLED display according to an exemplary embodiment of the present invention.

[0032] As shown in the drawing, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100, a plurality of second pixels 200, and a plurality of third pixels 300.

[0033] According to one embodiment, the pixel refers to a minimum unit for displaying an image (for example, the minimum addressable unit of the display).

[0034] In one embodiment, among the first pixels 100, the second pixels 200, and the third pixels 300, power lines for driving each of the pixels, such as a gate line, a data line, a driving power line, and the like, are located. In addition, in one embodiment, an insulation layer, such as a pixel defining layer, for defining each of the pixels is disposed. Further, in one embodiment, an OLED including an anode, an organic emission layer, and a cathode to correspond to each of the first pixels 100, the second pixels 200, and the third pixels 300 is disposed. These configurations are technologies known in the art and further description thereof is omitted for ease of description. In one embodiment, the

shape of each of the pixels is defined by the power lines, the pixel defining layer, the anode, or the like.

[0035] In the pixel arrangement of the drawing, each of the first pixels 100 has a smaller area (e.g., is smaller in area) than neighboring second pixels 200 and third pixels 300, and has a polygon shape. In the drawing, the first pixels 100 have an octagonal shape among the polygon shapes. In other embodiments, the first pixels 100 have one or more of various polygon shapes such as a triangle, a rectangle, a pentagon, a hexagon, a heptagon, and the like. For example, the first pixels 100 that neighbor each other among the plurality of first pixels 100 have hexagon shapes that are symmetrical to each other. In one embodiment, each of the plurality of first pixels 100 has the same hexagonal shape.

[0036] In one embodiment, the first pixels 100 are spaced apart from each other and arranged in rows, such as along a first virtual straight line VL1. In one embodiment, the first pixels 100 emit green light, and include an organic emission layer for emitting green light. In other embodiments, the first pixels 100 include an organic emission layer that emits light of one or more of various colors such as blue, red, or white color for emitting blue light, red light, or white light.

[0037] In the drawing, the second pixels 200 are arranged diagonally with respect to the first pixels 100, namely at first vertices P1 along one diagonal of a virtual square VS having one of the first pixels 100 as a center point (or center) of the virtual square VS. In a similar fashion, in the drawing, the third pixels 300 are arranged diagonally with respect to the first pixels 100, namely at second vertices P2 along the other diagonal of the virtual square VS.

[0038] In the virtual square VS of the drawing, each of the second pixels 200 is separated from the first pixel 100, and is centered at one of the first vertices P1 of the virtual square VS. Each of the second pixels 200 has a larger area than the neighboring first pixel 100 and the neighboring third pixels 300, and has a hexagonal shape. In other

embodiments, the second pixels 200 have one or more of various polygonal shapes such as a triangle, a rectangle, a pentagon, a hexagon, a heptagon, and the like.

[0039] In the drawing, the second pixels 200 each have the same hexagonal shape. In addition, the second pixels 200 are arranged diagonally and separated from each other by the first pixels 100. In one embodiment, the second pixels 200 emit blue light, and include an organic emission layer for emitting blue light. In other embodiments, the second pixels 200 include an organic emission layer that emits light of one or more of various colors such as red, green, or white for emitting red light, green light, or white light.

[0040] In a similar fashion, in the virtual square VS of the drawing, each of the third pixels 300 is separated from the first pixel 100 and the second pixels 200, and is centered at one of the second vertices P2 neighboring the first vertices P1 of the virtual square VS. Each of the third pixels 300 has a larger area than the neighboring first pixel 100 and a smaller area than the neighboring second pixels 200. The third pixels 300 has a quadrilateral shape among polygon shapes. In other embodiments, the third pixels 300 have one or more of various polygonal shapes such as a triangle, a rectangle, a pentagon, a hexagon, a heptagon, and the like.

[0041] In the drawing, the third pixels 300 each have the same quadrilateral shape. In addition, the third pixels 300 are arranged diagonally and separated from each other by the first pixels 100. In one embodiment, the third pixels 300 emit red light, and include an organic emission layer for emitting red light. In other embodiments, the third pixels 300 include an organic emission layer that emits light of one or more of various colors such as blue, green, or white for emitting emit blue light, green light, or white light.

[0042] In the drawing, each of the second pixels 200 and the third pixels 300 has a hexagonal shape and a quadrilateral shape, respectively. In another embodiment, each of the second pixels 200 and the third pixels 300 respectively has a quadrilateral shape

and a hexagonal shape. That is, in this other embodiment, one of the second pixels 200 or the third pixels 300 has a hexagonal shape and the other has a quadrilateral shape.

[0043] In one embodiment, the first pixels 100, the second pixels 200, and the third pixels 300 respectively emit green light, blue light, and red light. In other embodiments, the first pixels 100, the second pixels 200, and the third pixels 300 emit light of the same color. In still other embodiments, the first pixels 100, the second pixels 200, and the third pixels 300 emit light of different colors. In some embodiments, the first pixels 100 emit green light, and one of the second pixels 200 or the third pixels 300 emit blue light while the other emit red light.

[0044] In the drawing, third pixels 300 and the second pixels 200 are spaced apart from each other and alternately arranged in rows, such as along a second virtual straight line VL2. In a similar fashion, in the drawing, the third pixels 300 and the second pixels 200 are spaced apart from each other and alternately arranged in columns. Accordingly, in the drawing, in the virtual square VS, two of the second pixels 200 have their corresponding centers positioned at the first vertices P1 and two of the third pixels 300 have their corresponding centers positioned at the second vertices P2 to enclose a corresponding one of the first pixels 100 in the virtual square VS.

[0045] As described and illustrated in the drawing, the center of each of the second pixels 200 is positioned at one of the first vertices P1 of the virtual square VS. In addition, the center of the corresponding first pixel 100 is the center of the virtual square VS. Further, the center of each of the third pixels 300 is positioned at one of the second vertices P2. Therefore, the plurality of second pixels 200 of which the centers are positioned at the first vertices P1 and the plurality of third pixels 300 of which the centers are positioned at the second vertices P2 respectively enclose one of the first pixels 100 in the virtual square VS.

[0046] Further, and as illustrated in the drawing, the first pixels 100, the second pixels 200, and the third pixels 300 have polygon shapes. In the drawing, the distance between

one of the first pixels 100 and an adjacent one of the second pixels 200 as well as a distance between one of the first pixels 100 and an adjacent one of the third pixels 300 is the same first length L1. In addition, a distance between one of the second pixels 200 and an adjacent one of the third pixels 300 is a second length L2 that is different from the first length L1. Further, in the drawing, a distance between neighboring first pixels 100 is a third length L3 that is longer than the first length L1 and the second length L2.

[0047] For example, in some embodiments, the first length L1 is between 15 um (micrometers) and 35 um, the second length L2 is between 20 um and 45 um, and the third length L3 is between 25 um and 65 um.

[0048] Therefore, gaps of the first length L1 are formed between adjacent pairs of the first pixels 100 and the second pixels 200, and between adjacent pairs of the first pixels 100 and the third pixels 300. In addition, the gaps of the third length L3 that is longer than the first length L1 are formed between the neighboring ones of the first pixels 100. In one embodiment, this results in improved deposition reliability in the deposition process using the fine metal mask to form the green, blue, and red organic emission layers respectively included in the first pixels 100, the second pixels 200, and the third pixels 300.

[0049] In addition, in one embodiment, the plurality of second pixels 200 and the plurality of third pixels 300 are arranged to enclose the first pixels 100 in the virtual squares VS so that an aperture ratio of each of the first pixels 100, the second pixels 200, and the third pixels 300 can be improved. Accordingly, in one embodiment, the manufacturing time and the manufacturing cost of the OLED display is reduced and the display quality of the image of the OLED display is improved.

[0050] Further, in the pixel arrangement structure of the OLED display of the drawing according to an exemplary embodiment of the present invention, the second pixels 200 that emit blue light have the shortest life span among the first pixels 100, the second pixels 200, and the third pixels 300. Accordingly, the second pixels 200 have a larger

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area than the first pixels 100 and the third pixels 300, thereby suppressing the deterioration of the life span of the OLED display. That is, in one embodiment, the pixel arrangement structure of the OLED display of the drawing provides improved life span.

[0051] As described above, in the pixel arrangement structure of the OLED display of the drawing according to an exemplary embodiment of the present invention, the first pixels 100, the second pixels 200, and the third pixels 300 have simple polygonal shapes such as an octagon, a hexagon, and a quadrangle. In consideration of the deposition process of the organic emission layer, which in one embodiment is a unique manufacturing feature of the OLED display, a center of one of the first pixels 100 is positioned at the center of the virtual square VS, a center of one of the second pixels 200 is positioned at the first vertex P1, and a center of one of the third pixels 300 is positioned at the second vertex P2 to both improve deposition reliability of the organic emission layer in the deposition process using the fine metal mask and improve an aperture of each of the first, second, and third pixels 100, 200, and 300.

[0052] That is, according to an exemplary embodiment of the present invention as illustrated in the drawing, the pixel arrangement structure of the OLED display includes a plurality of first pixels 100 having an octagonal shape, a plurality of second pixels 200 having a hexagonal shape, and a plurality of third pixels 300 having a quadrilateral shape. In one or more embodiments, the shapes and arrangement of the first pixels 100, the second pixels 200, and the third pixels 300 improve the deposition reliability of the organic emission layer while also improving the aperture ratio of each of the first pixels 100, the second pixels, 200, and the third pixels 300.

[0053] While this invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims, and equivalents thereof.

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<Description of some symbols>

first pixel 100, second pixels 200, third pixels 300

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WHAT IS CLAIMED IS:

1. A pixel arrangement structure of an organic light emitting diode display, comprising:

a first pixel having a center coinciding with a center of a virtual square;

a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and

a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square,

wherein the first pixel, the second pixel, and the third pixel have polygonal shapes.

2. The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels, and

the second pixels are separated from each other by the first pixel.

3. The pixel arrangement structure of claim 1, wherein

the third pixel comprises a pair of third pixels, and

the third pixels are separated from each other by the first pixel.

4. The pixel arrangement structure of claim 1, wherein

the second pixel comprises a pair of second pixels,

the third pixel comprises a pair of third pixels, and

the second pixels and the third pixels enclose the first pixel in the virtual square.

5. The pixel arrangement structure of claim 4, wherein each of the second pixels and the third pixels is larger in area than the first pixel.

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6. The pixel arrangement structure of claim 5, wherein

the first pixel has an octagonal shape, and

at least one of the second pixel or the third pixel has an octagonal shape.

7. The pixel arrangement structure of claim 5, wherein

the first pixel has an octagonal shape, and

one of the second pixel or the third pixel has a hexagonal shape and an other of the second pixel or the third pixel has a quadrilateral shape.

8. The pixel arrangement structure of claim 7, wherein

the virtual square comprises a pair of virtual squares sharing a common side,

the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares, and

the first pixels have octagonal shapes that are symmetrical to each other.

9. The pixel arrangement structure of claim 7, wherein each of the second pixels is larger in area than each of the third pixels.

10. The pixel arrangement structure of claim 9, wherein a distance between the first pixel and the second pixels as well as a distance between the first pixel and the third pixels is a same first length.

11. The pixel arrangement structure of claim 10, wherein

the virtual square comprises a pair of virtual squares sharing a common side,

the first pixel comprises a pair of first pixels having centers respectively coinciding with centers of the virtual squares,

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a distance between each of the second pixels and the third pixels is a same second length, and

a distance between the first pixels is a third length that is longer than the first length and the second length.

12. The pixel arrangement structure of claim 1, wherein the first pixel, the second pixel, and the third pixel are configured to emit different color light.

13. The pixel arrangement structure of claim 12, wherein

the first pixel is configured to emit green light,

one of the second pixel or the third pixel is configured to emit blue light, and

an other of the second pixel or the third pixel is configured to emit red light.

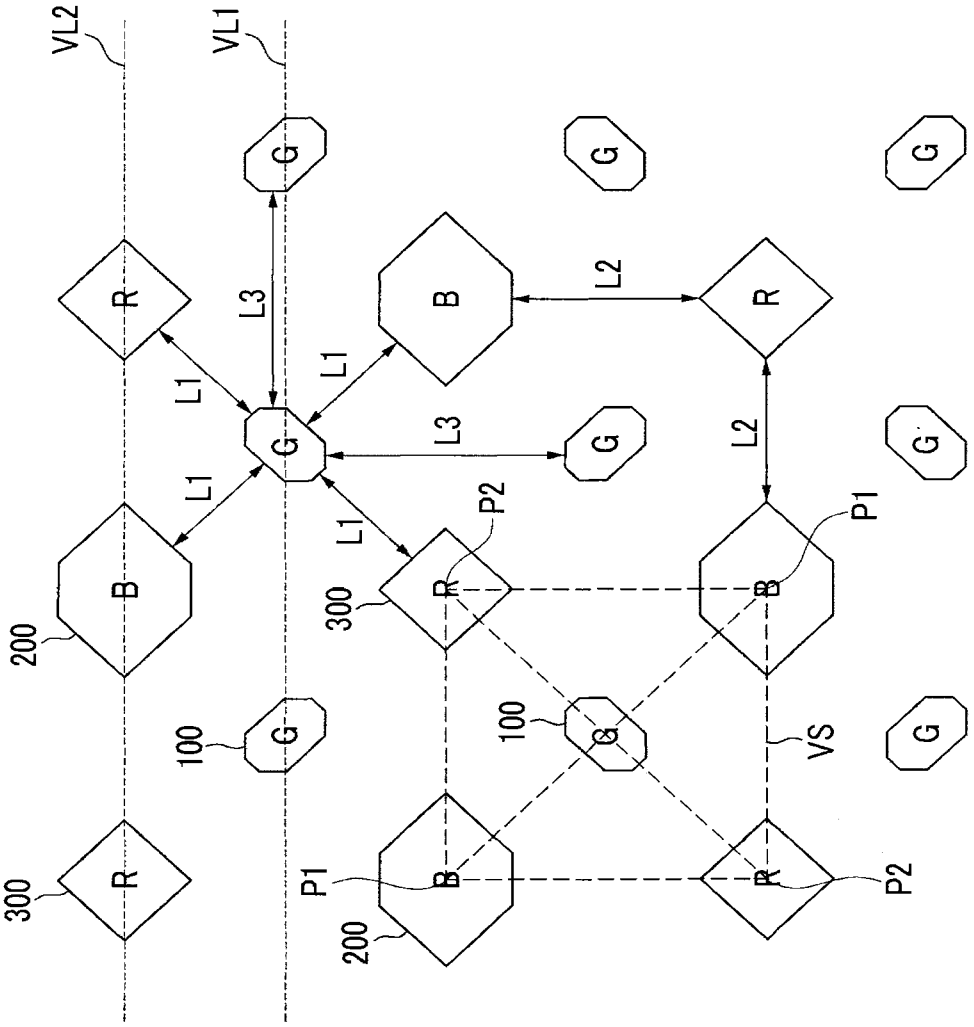
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ABSTRACT

A pixel arrangement structure of an organic light emitting diode (OLED) display is provided. The pixel arrangement structure includes: a first pixel having a center coinciding with a center of a virtual square; a second pixel separated from the first pixel and having a center at a first vertex of the virtual square; and a third pixel separated from the first pixel and the second pixel, and having a center at a second vertex neighboring the first vertex of the virtual square. The first pixel, the second pixel, and the third pixel have polygonal shapes.

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VL2
VL1
G
R
B
L1
L2
L3
P1
P2
VS
100
200
300

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Signature

Inventor	:	Sang-Shin Lee
Application No.	:	To Be Determined
Filed	:	April 26, 2013
Title	:	PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY
Grp./Div.	:	To Be Determined
Examiner	:	To Be Determined
Docket No.	:	72827/P849

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS IN ACCORDANCE WITH 37 CFR. 1.5

Commissioner for Patents
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Alexandria, VA 22313-1450

Post Office Box 29001
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April 26, 2013

Commissioner:

Attached herewith is a General Power of Attorney for the above-identified patent application.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

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Jun-Young E. Jeon
Reg. No. 43,693
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JEJ/frs

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The undersigned representative of SAMSUNG DISPLAY CO., LTD. ("Principal") is authorized to act on behalf of Principal, and Principal hereby appoints the practitioners associated with

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of the firm CHRISTIE, PARKER & HALE, LLP, telephone 626/795-9900, as attorneys or agents to transact all business in the United States Patent and Trademark Office for matters in which Principal is the applicant pursuant to assignment.

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SAMSUNG DISPLAY CO., LTD.

Date September 27, 2012 By _____

KyuSuk Kim
Principal Engineer, Legal & IP Team

JEJ/jhg

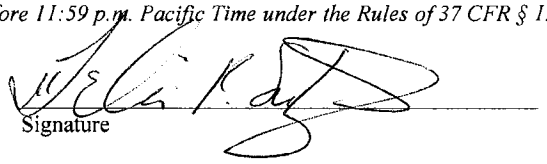
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Signature

Inventor : Sang-Shin Lee
Application No. : To Be Determined
Filed : April 26, 2013
Title : PIXEL ARRANGEMENT STRUCTURE FOR ORGANIC LIGHT EMITTING DIODE DISPLAY

Grp./Div. : To Be Determined
Examiner : To Be Determined

Docket No. : 72827/P849

INFORMATION DISCLOSURE STATEMENT
37 CFR § 1.97(b)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Post Office Box 29001
Glendale, CA 91209-9001
April 26, 2013

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In compliance with the duty of disclosure under 37 CFR §§ 1.56, 1.97 and 1.98, and in accordance with the provisions in the Manual of Patent Examining Procedure §§ 609 and 707.05(b), enclosed is FORM PTO/SB/08A/B listing the references that are known to applicant. Copies of each of the listed non-U.S. references are enclosed. This filing is timely because it is made during one of the periods described in 37 CFR § 1.97(b).

It is respectfully requested that the listed references be considered in the examination of this application and identified on the list of references cited on the patent issuing for this application. Applicant also requests that an initialed copy of FORM PTO/SB/08A/B be entered in the application file and returned to applicant with the next communication from the Office in accordance with MPEP § 609.

Docket No.: 72827/P849

The Commissioner is hereby authorized to charge any fees which may be required by this paper to Deposit Account No. 03-1728. Please show our docket number with any Deposit Account transaction.

Respectfully submitted,
CHRISTIE, PARKER & HALE, LLP

By _____
Jun-Young E. Jeon
Reg. No. 43,693
626/795-9900

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Enclosures: Form PTO/SB/08A/B, w/references

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