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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/019,937	09/24/2019	10423034	HARU-0136	7509

38327 7590 09/04/2019

Juan Carlos A. Marquez
Marquez Intellectual Property Law Office PLLC
1629 K Street, NW
Suite 300
Washington, DC 20006

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

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

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

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

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

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

Takahiro OCHIAI, Chiba, JAPAN;
Japan Display Inc., Tokyo, JAPAN;
Panasonic Liquid Crystal Display Co., Ltd., Himeji-shi, JAPAN;
Tohru SASAKI, Mobara, JAPAN;
Tetsuya NAGATA, Mobara, JAPAN;

IR103 (Rev. 10/09)

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)

38327 7590 05/20/2019

Juan Carlos A. Marquez
Marquez Intellectual Property Law Office PLLC
1629 K Street, NW
Suite 300
Washington, DC 20006

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.
16/019,937	06/27/2018	Takahiro OCHIAI	HARU-0136	7509

TITLE OF INVENTION: LIQUID CRYSTAL DISPLAY DEVICE

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	08/20/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
LAU, EDMOND C	2871	349-155000

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 Juan Carlos A. Marquez
2 Marquez IP Law Office, PLLC
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)
(1) Japan Display Inc.	Tokyo, Japan
(2) Panasonic Liquid Crystal Display Co., Ltd.	Hyogo-ken, Japan

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. 60-0155

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 /juan.carlos.a.marquez/ Date August 12, 2019

Typed or printed name Juan Carlos A. Marquez Registration No. 34,072

Electronic Patent Application Fee Transmittal	
Application Number:	16019937
Filing Date:	27-Jun-2018
Title of Invention:	LIQUID CRYSTAL DISPLAY DEVICE
First Named Inventor/Applicant Name:	Takahiro OCHIAI
Filer:	Juan Carlos A. Marquez/Lily Niu
Attorney Docket Number:	HARU-0136
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:	36849481
Application Number:	16019937
International Application Number:	
Confirmation Number:	7509
Title of Invention:	LIQUID CRYSTAL DISPLAY DEVICE
First Named Inventor/Applicant Name:	Takahiro OCHIAI
Customer Number:	38327
Filer:	Juan Carlos A. Marquez/Lily Niu
Filer Authorized By:	Juan Carlos A. Marquez
Attorney Docket Number:	HARU-0136
Receipt Date:	12-AUG-2019
Filing Date:	27-JUN-2018
Time Stamp:	16:16:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	EFT
Payment was successfully received in RAM	$1000
RAM confirmation Number	E20198BG16469254
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)	HARU-136-Issue_fee_form.pdf	610716 60456fc14f98b25bf170d3a78fd93e130f5c02e0	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30343 82df1913e49d437647fb3085ef1fc188f49d502f	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	641059		

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.

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38327 7590 08/05/2019

Juan Carlos A. Marquez
Marquez Intellectual Property Law Office PLLC
1629 K Street, NW
Suite 300
Washington, DC 20006

EXAMINER	
LAU, EDMOND C	

ART UNIT	PAPER NUMBER
2871	

NOTIFICATION DATE	DELIVERY MODE
08/05/2019	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):

USPTO@dockettrak.com
lniu@marqueziplaw.com
mail@marqueziplaw.com

Applicant-Initiated Interview Summary	**Application No.** 16/019,937	**Applicant(s)** OCHIAI et al.	
	Examiner EDMOND C LAU	**Art Unit** 2871	**AIA (FITF) Status** No

All participants (applicant, applicants representative, PTO personnel):

(1) EDMOND C. LAU. (3) _____.

(2) Juan Carlos Marquez. (4) _____.

Date of Interview: 31 July 2019.

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: US 20040084673 A1 to Hirakata et al..

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...)

Discussed entering proposed amendments under §1.312 and was determined that the proposed amendments would substantially change the scope of the claims therefore will not be entered if submitted. Applicant is advised that a continuation may be filed with the proposed claims..

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

/EDMOND C LAU/ Primary Examiner, Art Unit 2871	

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 examiners 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 applicants 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 applicants 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 examiners 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 examiners initials.

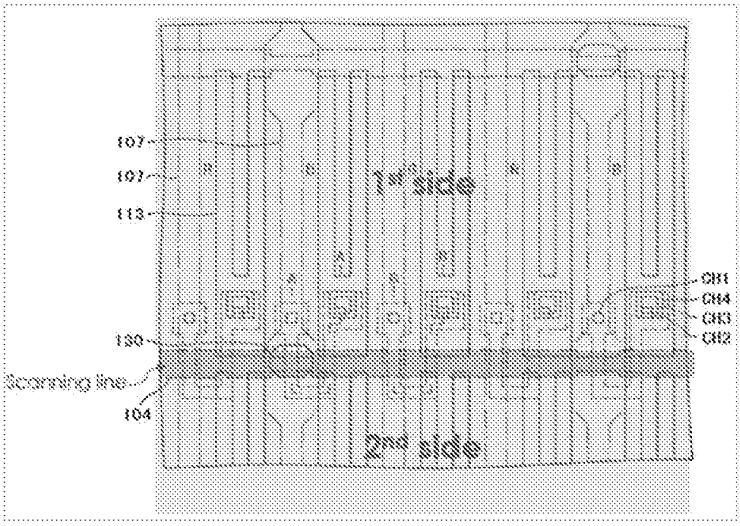
PROPOSED CLAIM AMENDMENTS FOR CONSIDERATION UNDER §1.312

FOR U.S. APPLICATION NO. 16/019,937

Proposed Amendment A:

1. A liquid crystal display device comprising:
a first substrate;
a second substrate;
liquid crystal enclosed between the first substrate and the second substrate;
a scanning line formed between the first substrate and the liquid crystal;
a drain line crossing the scanning line;
a thin film transistor having a semiconductor layer and a source electrode, a first insulation film above the semiconductor layer and having a first contact hole and a second contact hole, the semiconductor layer being connected to the drain line via the first contact hole and connected to the source electrode via the second contact hole;
an organic film above the source electrode;
a second insulation film;
a common electrode between the organic film and the second insulation film;
a first pixel electrode above the second insulation film and connected to the source electrode via a third contact hole formed in the second insulation film;
a second pixel electrode adjacent to the first pixel electrode; and
a spacer disposed between the first substrate and the second substrate,
wherein the scanning line is between ~~has~~ a first side and a second side ~~opposite to the first side~~ in the plan view, the first pixel electrode is located on the first side and the second pixel electrode is located on the second side,
wherein the semiconductor layer overlapped with the scanning line at a first channel region and a second channel region, and a part of the semiconductor layer between the first channel region and the second channel region is located on the second side ~~of the scanning line~~,
wherein the spacer is overlapped with the semiconductor layer, the drain line, the organic film, and the common electrode,
wherein the first contact hole, the second contact hole, and the third contact hole are located on the first side ~~of the scanning line~~, and
wherein the part of the semiconductor layer between the first channel region and the second channel region is overlapped with the second pixel electrode.

(supplemental drawing)



Proposed Amendment B:

1. A liquid crystal display device comprising:

a first substrate;

a second substrate;

liquid crystal enclosed between the first substrate and the second substrate;

a scanning line formed between the first substrate and the liquid crystal;

a drain line crossing the scanning line;

a thin film transistor having a semiconductor layer and a source electrode, a first insulation film above the semiconductor layer and having a first contact hole and a second contact hole, the semiconductor layer being connected to the drain line via the first contact hole and connected to the source electrode via the second contact hole;

an organic film above the source electrode;

a second insulation film;

a common electrode between the organic film and the second insulation film;

a first pixel electrode above the second insulation film and connected to the source electrode via a third contact hole formed in the second insulation film;

a second pixel electrode adjacent to the first pixel electrode; and

a spacer disposed between the first substrate and the second substrate,

wherein the scanning line has a first side and a second side opposite to the first side in the plan view, the first pixel electrode is located at a first region ~~on the first side~~ and the second pixel electrode is located at a second region ~~on the second side~~,

wherein the first side is between the first region and the second side and the second side is between the second region and the first side,

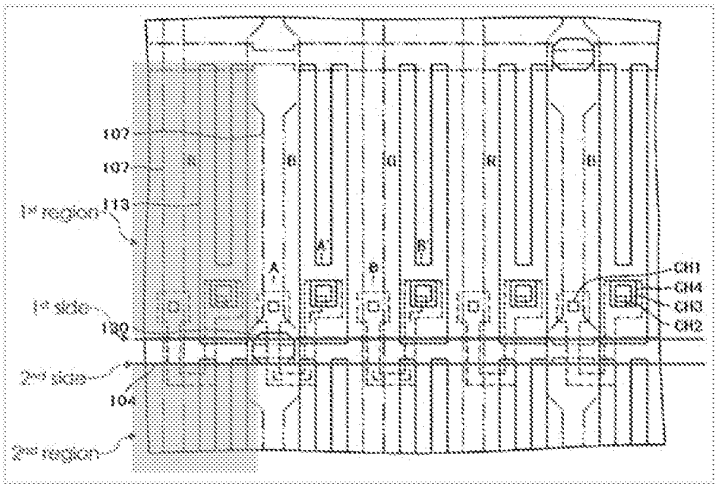
wherein the semiconductor layer overlapped with the scanning line at a first channel region and a second channel region, and a part of the semiconductor layer between the first channel region and the second channel region is located on the second region ~~side of the scanning line~~,

wherein the spacer is overlapped with the semiconductor layer, the drain line, the organic film, and the common electrode,

wherein the first contact hole, the second contact hole, and the third contact hole are located on the first region ~~side of the scanning line~~, and

wherein the part of the semiconductor layer between the first channel region and the second channel region is overlapped with the second pixel electrode.

(supplemental drawing)



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NOTICE OF ALLOWANCE AND FEE(S) DUE

38327 7590 05/20/2019

Juan Carlos A. Marquez
Marquez Intellectual Property Law Office PLLC
1629 K Street, NW
Suite 300
Washington, DC 20006

EXAMINER
LAU, EDMOND C

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 05/20/2019

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/019,937	06/27/2018	Takahiro OCHIAI	HARU-0136	7509

TITLE OF INVENTION: LIQUID CRYSTAL DISPLAY DEVICE

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	08/20/2019

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.

PART B - FEE(S) TRANSMITTAL

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By fax, send to: (571)-273-2885

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/019,937	06/27/2018	Takahiro OCHIAI	HARU-0136	7509

TITLE OF INVENTION: LIQUID CRYSTAL DISPLAY DEVICE

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	08/20/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
LAU, EDMOND C	2871	349-155000

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. _____

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/019,937	06/27/2018	Takahiro OCHIAI	HARU-0136	7509

38327 7590 05/20/2019

Juan Carlos A. Marquez
Marquez Intellectual Property Law Office PLLC
1629 K Street, NW
Suite 300
Washington, DC 20006

EXAMINER	
LAU, EDMOND C	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 05/20/2019

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. 16/019,937	Applicant(s) OCHIAI et al.	
	Examiner EDMOND C LAU	Art Unit 2871	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 6/27/2018.
   ☐ 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 1-8 . 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. 14709529 .
   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 areply 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 _____.

/EDMOND C LAU/
Primary Examiner, Art Unit 2871

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119 (a)-(d). The certified copy has been filed in parent Application No. 14/709529, filed on 5/12/2015.

Allowable Subject Matter

Claims 1-8 are allowed.

The following is an examiner's statement of reasons for allowance:

Regarding Claim 1. The prior art of record, taken alone or in combination, fails to teach or disclose, in light of the specifications, "the part of the semiconductor layer between the first channel region and the second channel region is overlapped with the second pixel electrode."

Claims 2-8 are allowable due to dependency to claim 1.

US 20040084673 A1 to Hirakata et al. for instance, taken alone or in combination with the prior art of record, fails to teach or disclose, in light of the specifications, the recited claim limitations of claim 1. Specifically, Hirakata discloses various limitations of base claim 1: A liquid crystal display device comprising: a first substrate (Fig. 8B active matrix substrate); a second substrate (Fig. 8B opposite substrate 574); liquid crystal enclosed between the first substrate and the second substrate (Fig. 8B liquid crystal 578); a scanning line formed between the first substrate and the liquid crystal (Fig. 6C gate wirings (also referred to as gate electrodes) 521 to 524a and 524b, See also Fig. 10 gate wiring 808); a drain line crossing the scanning line (Fig. 7C source wirings 555 to 558, and drain wirings 559 to 562, para 131 "Note that, although

not shown in the figures, the drain wirings 559 and 560 are formed from the same wiring in order to form a CMOS circuit", See also Fig. 10 source wiring 809); a thin film transistor (See Fig. 8B TFT 704) having a semiconductor layer (See Fig. 8B channel forming regions 613 and 614, a source region 615, a drain region 616, Loff regions 617 to 620, and an n-type impurity region (a) 621) and a source electrode (Fig. 7C- Fig. 8B drain wiring 562), a first insulation film above the semiconductor layer and having a first contact hole and a second contact hole (Fig. 7B insulating film 548), the semiconductor layer being connected to the drain line via the first contact hole and connected to the source electrode via the second contact hole (See Fig. 8B); an organic film above the source electrode (Fig. 7D insulating film 564) para 136; a second insulation film (Fig. 8B anodic oxide film 567); a common electrode between the organic film and the second insulation film (Fig. 8B shielding film 565, para 151); a first pixel electrode above the second insulation film and connected to the source electrode via a third contact hole formed in the second insulation film (Fig. 8B pixel electrode 569); a second pixel electrode adjacent to the first pixel electrode (Fig. 8A pixel electrode 570); and a spacer disposed between the first substrate and the second substrate (Fig. 8A spacer 568), wherein the scanning line has a first side and a second side opposite to the first side in the plan view, the first pixel electrode is located on the first side and the second pixel electrode is located on the second side (See Fig. 8B), wherein the semiconductor layer overlapped with the scanning line at a first channel region and a second channel region (Fig. 8B channel forming regions 613 and 614 overlapped with Gate wirings 524a and 524b), and a part of the semiconductor layer between the first channel region and the second channel region is located on the second side of the scanning line (See Fig. 8B), wherein the spacer is overlapped with the semiconductor layer, the drain line, the organic film, and the common electrode (See Fig. 8B), the first contact hole, the second contact hole, and the third

contact hole are located on the first side of the scanning line (See Fig. 8B). However, Hirakata does not disclose that "wherein the part of the semiconductor layer between the first channel region and the second channel region is overlapped with the second pixel electrode." Therefore, the prior art of record taken alone or in combination fails to teach or disclose, in light of the specifications, the recited claim limitations of claim 1.

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

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDMOND C LAU whose telephone number is (571)272-5859. The examiner can normally be reached on M-Th 8am-6pm EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael H Caley can be reached on (571) 272-2286. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EDMOND C LAU/
Primary Examiner, Art Unit 2871

Notice of References Cited	Application/Control No. 16/019,937	Applicant(s)/Patent Under Reexamination OCHIAI et al.	
	Examiner EDMOND C LAU	Art Unit 2871	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-20040084673-A1	05-2004	Hirakata, Yoshiharu	G02F1/13394	257/59
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

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.

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/019,937	OCHIAI et al.
	Examiner	**Art Unit**
	EDMOND C LAU	2871

CPC								
Symbol							**Type**	**Version**
G02F	/	1	/	1339			F	2013-01-01
G02F	/	1	/	136286			I	2013-01-01
G02F	/	1	/	13394			I	2013-01-01
G02F	/	1	/	136277			I	2013-01-01
G02F	/	1	/	1368			I	2013-01-01
G02F	/	1	/	134363			A	2013-01-01
G02F	/	1	/	136227			A	2013-01-01
G02F	/	2001	/	13415			A	2013-01-01
G02F	/	2001	/	13606			A	2013-01-01

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

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	8	
/EDMOND C LAU/ Primary Examiner, Art Unit 2871	13 May 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

U.S. Patent and Trademark Office — Part of Paper No.: 20190513

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/019,937	OCHIAI et al.
	Examiner	**Art Unit**
	EDMOND C LAU	2871

INTERNATIONAL CLASSIFICATION				
CLAIMED				
G02F	/	1	/	1339

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

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

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	8	
/EDMOND C LAU/ Primary Examiner, Art Unit 2871	13 May 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

U.S. Patent and Trademark Office

Part of Paper No.: 20190513

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/019,937	OCHIAI et al.
	Examiner	**Art Unit**
	EDMOND C LAU	2871

☑ 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														
	2														
	3														
	4														
	5														
	6														
	7														
	8														

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	8	
/EDMOND C LAU/ Primary Examiner, Art Unit 2871	13 May 2019	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	6

U.S. Patent and Trademark Office Part of Paper No.: 20190513

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	16/019,937	OCHIAI et al.
	Examiner	Art Unit
	EDMOND C LAU	2871

CPC - Searched*		
Symbol	Date	Examiner
G02F1/1339	05/13/2019	EL

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
Conducted inventor name search	05/13/2019	EL
Reviewed parent application 14709529	05/13/2019	EL
Conducted EAST search	05/13/2019	EL
Conducted interference search	05/13/2019	EL

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
G02F1	1339	05/13/2019	EL

/EDMOND C LAU/ Primary Examiner, Art Unit 2871	

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

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16019937
Filing Date	2018-06-27
First Named Inventor	OCHIAI et al.
Art Unit	TBD
Examiner Name	TBD
Attorney Docket Number	HARU-0136

U.S.PATENTS Remove

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
	1	6762805	B2	2004-07-13	Ishino	
	2	6921917	B2	2005-07-26	Choi et al.	
	3	6999060	B2	2006-02-14	Choo	
	4	7285902	B2	2007-10-23	Koo et al.	
	5	7349038	B2	2008-03-25	Park et al.	
	6	7352429	B2	2008-04-01	Tseng et al.	
	7	7133108	B2	2006-11-07	Shimizu et al.	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.C.L/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	16019937
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First Named Inventor	OCHIAI et al.
Art Unit	TBD
Examiner Name	TBD
Attorney Docket Number	HARU-0136

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20070002219	A1	2007-01-04	Lee et al.	
	2	20080185589	A1	2008-08-07	Shin et al.	
	3	20090284695	A1	2009-11-19	Kim et al.	
	4	20020044230	A1	2002-04-18	Yamazaki et al.	
	5	20070216627	A1	2007-09-20	Kim et al.	
	6	20080123007	A1	2008-05-29	Cui et al.	
	7	20040084673	A1	2004-05-06	Hirakata et al.	

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	JP 11-084386	JP		1999-03-26	Toshiba Corporation	Abstract	X

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.C.L/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16019937
	Filing Date	2018-06-27
	First Named Inventor	OCHIAI et al.
	Art Unit	TBD
	Examiner Name	TBD
	Attorney Docket Number	HARU-0136

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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	/EDMOND C LAU/	Date Considered	05/13/2019

*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. /E.C.L/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16019937
	Filing Date	2018-06-27
	First Named Inventor	OCHIAI et al.
	Art Unit	TBD
	Examiner Name	TBD
	Attorney Docket Number	HARU-0136

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.

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

None

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	/juan.carlos.a.marquez/	Date (YYYY-MM-DD)	2018-06-27
Name/Print	Juan Carlos A. Marquez	Registration Number	34072

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.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.C.L/

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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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.C.L/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	199	(("OCHIAI") near3 ("Takahiro")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 14:21
S2	187	(("SASAKI") near3 ("Tohru")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 14:21
S3	141	(("NAGATA") near3 ("Tetsuya")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 14:21
S4	5	("12".src. and "379363".ap.) or "12379363".RLAN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2016/09/01 14:21
S5	3	("13".src. and "600349".ap.) or "13600349".RLAN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2016/09/01 14:21
S6	2	("20150241723").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	OFF	2016/09/01 14:21
S7	550061	spacer	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:11
S8	33	S1 and S7	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:11
S9	29	S2 and S7	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:11
S10	11	S3 and S7	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:11
S11	13	("20020044230" | "20070002219" | "20070216627" | "20080123007" | "20080185589" | "20090284695" | "6762805" | "6921917" | "6999060" | "7133108" | "7285902" | "7349038" | "7352429").PN. OR ("9036104").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:11
S12	10	("20070002219" | "20080185589" | "20090284695" | "6762805" | "6921917" | "6999060" | "7133108" | "7285902" | "7349038" | "7352429").PN. OR ("8284339").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:12
S13	7909	spacer with (tft (thin adj film))	US-PGPUB; USPAT;	OR	OFF	2016/09/01 15:42

			USOCR			
S14	1698206	semiconductor	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:43
S15	4751	S13 and S14	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:43
S16	746852	liquid adj crystal	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:43
S17	3290	S15 and S16	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:43
S18	59343	((gate scan) adj line) and ((drain source data) adj line)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:44
S19	1519	S17 and S18	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:44
S20	13532396	@pd<="20080226"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:46
S21	455	S19 and S20	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:46
S22	7811	(top adj gate) with tft	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:56
S23	5	(top adj gate) with tft with spacer	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:56
S24	9	(bottom adj gate) with tft with spacer	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 15:57
S25	1071	((semiconductor adj layer) with gate with drain) same spacer	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 16:00
S26	391	S25 and S16	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 16:00
S27	84	S26 and S20	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 16:02
S28	448	(black adj matrix) with tft with spacer	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/01 17:27
S29	13532396	@pd<="20080226"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 17:27
S30	85	S28 and S29	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/01 17:27
S31	13	("20020044230" | "20070002219" |	US-PGPUB;	OR	OFF	2016/09/27

		"20070216627" | "20080123007" | "20080185589" | "20090284695" | "6762805" | "6921917" | "6999060" | "7133108" | "7285902" | "7349038" | "7352429").PN.	USPAT			13:53
S32	596	(top adj gate) and (tft with spacer)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:19
S33	35426	(top adj gate)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2016/09/27 14:20
S34	1179	S33 AND ((H01L51/0545).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2016/09/27 14:23
S35	207	@pd<="20080226" and S34	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:29
S36	2391	S33 AND ((H01L29/66757 OR H01L51/0541 OR H01L29/78675).CPC.)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:31
S37	1064	@pd<="20080226" and S36	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:32
S38	2391	S36 AND ((H01L29/66757 OR H01L51/0541 OR H01L29/78675).CPC.)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:32
S39	109	S35 AND ((H01L29/66757 OR H01L51/0541 OR H01L29/78675).CPC.)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:32
S40	215	S33 AND ((G02F1/1339).CPC.)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:33
S41	502	S33 AND ((G02F1/1339 OR G02F1/13394 OR G02F2001/13685 OR G02F2001/13396).CPC.)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:37
S42	0	S35 AND ((G02F1/1339).CPC.)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:37
S43	13532396	@pd<="20080226"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:37
S44	1192	S43 AND ((G02F1/1339).CPC.)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:37
S45	2294	S43 AND ((G02F1/1339 OR G02F1/13394 OR G02F2001/13685 OR G02F2001/13396).CPC.)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:37
S46	14	S45 AND ((H01L29/66757 OR H01L51/0541 OR H01L29/78675).CPC.)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:38
S47	6231	G02F2001/13685.cpc. ((G02F1/1339 OR G02F1/13394 OR G02F2001/13396).CPC.)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:41
S48	2294	@pd<="20080226" and S47	US-PGPUB;	OR	OFF	2016/09/27

			USPAT; USOCR			14:42
S49	27393	(semiconductor with spacer)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:42
S50	27976	(semiconduct$4 with spacer)	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:42
S51	80	S48 and S50	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 14:43
S52	17	("4857907" | "5345324" | "5414547" | "5686977" | "5986723" | "6008874" | "6249325").PN. OR ("6762805").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/27 17:19
S56	50	(US-20080013023-$ or US-20080013022-$ or US-20070188690-$ or US-20080007665-$ or US-20070279374-$ or US-20070132936-$ or US-20070019135-$ or US-20060290856-$ or US-20060290829-$ or US-20060197898-$ or US-20070109469-$ or US-20070002259-$ or US-20020182766-$ or US-20090284695-$ or US-20080020518-$ or US-20070170435-$ or US-20070069204-$ or US-20070040984-$ or US-20070002263-$ or US-20060289965-$ or US-20060181665-$ or US-20050190338-$ or US-20020044230-$ or US-20150241723-$).did. or (US-6762805-$).did.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT	OR	ON	2019/05/13 13:30
S57	239	((("OCHIAI") near3 ("Takahiro"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/13 13:30
S58	227	((("SASAKI") near3 ("Tohru"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/13 13:30
S59	166	((("NAGATA") near3 ("Tetsuya"))).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2019/05/13 13:30
S60	2	("20180307072").PN.	US-PGPUB; USPAT; USOCR; DERWENT	OR	ON	2019/05/13 13:30
S61	14	("20020044230" | "20040084673" | "20070002219" | "20070216627" | "20080123007" | "20080185589" | "20090284695" | "6762805" | "6921917" | "6999060" | "7133108" | "7285902" | "7349038" | "7352429").PN.	US-PGPUB; USPAT	OR	ON	2019/05/13 14:11

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S53	38638	(top adj gate)	US-PGPUB; USPAT	OR	OFF	2018/03/19 07:57

S54	7914	((G02F1/1339 OR G02F1/13394 OR G02F2001/13685 OR G02F2001/13396).CPC.)	US-PGPUB; USPAT	OR	OFF	2018/03/19 07:58
S55	802	S53 and S54	US-PGPUB; USPAT	OR	OFF	2018/03/19 07:58
S62	4054	((G02F1/1339 OR G02F1/13394 OR G02F2001/13685 OR G02F2001/13396).CPC.)	USPAT	OR	OFF	2019/05/13 14:11
S63	21185	(top adj gate)	USPAT	OR	OFF	2019/05/13 14:11

5/13/2019 2:24:27 PM
C:\Users\elau\Documents\Application files\16 xxx xxx\16 019 937\16 019 937.wsp

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
16/019,937	06/27/2018	Takahiro OCHIAI	HARU-0136

CONFIRMATION NO. 7509

38327
Juan Carlos A. Marquez
Marquez Intellectual Property Law Office PLLC
1629 K Street, NW
Suite 300
Washington, DC 20006

PUBLICATION NOTICE

OC000000103352222

Title:LIQUID CRYSTAL DISPLAY DEVICE

Publication No.US-2018-0307072-A1
Publication Date:10/25/2018

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 Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, 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 https://portal.uspto.gov/pair/PublicPair. 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

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 16/019,937

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	300
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	660
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	760
TOTAL CLAIMS (37 CFR 1.16(i))	8 minus 20 =	*			OR	x 100 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*				x 460 =	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	1720

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	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
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
16/019,937	06/27/2018		1720	HARU-0136	8	1

CONFIRMATION NO. 7509

FILING RECEIPT

38327
Juan Carlos A. Marquez
Marquez Intellectual Property Law Office PLLC
1629 K Street, NW
Suite 300
Washington, DC 20006

Date Mailed: 07/19/2018

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)

Takahiro OCHIAI, Chiba, JAPAN;
Tohru SASAKI, Mobara, JAPAN;
Tetsuya NAGATA, Mobara, JAPAN;

Applicant(s)

Japan Display Inc., Tokyo, JAPAN;
Panasonic Liquid Crystal Display Co., Ltd., Himeji-shi, JAPAN;

Power of Attorney: The patent practitioners associated with Customer Number 38327

Domestic Priority data as claimed by applicant

This application is a CON of 14/709,529 05/12/2015 PAT 10031372
and is a CON of 13/600,349 08/31/2012 PAT 9036104
and is a CON of 12/379,363 02/19/2009 PAT 8284339

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.)
JAPAN 2008-044247 02/26/2008 No Access Code Provided

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 07/18/2018

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 16/019,937**

Projected Publication Date: 10/25/2018

Non-Publication Request: No

Early Publication Request: No
Title

LIQUID CRYSTAL DISPLAY DEVICE

Preliminary Class

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).

CUSTOMER NO.	38327

CONTINUATION/DIVISIONAL APPLICATION TRANSMITTAL

(Rule 53(b) Continuation or Divisional) ☐ DUPLICATE

Address to: **Commissioner of Patents**
P.O. Box 1450
Alexandria, VA 22313-1450

Attorney Docket No.:	HARU-0136
First Named Inventor:	OCHIAI
Total Pages:	38

This requests a ☒ Continuation or ☐ Divisional application under 37 CFR §1.53(b) of prior application:

Application. No.:	14/709,529	Group Art Unit:	5948
Filed on:	May 12, 2015	Examiner:	Edmond C. Lau
Entitled:	LIQUID CRYSTAL DISPLAY DEVICE		

☒ 1. The entire disclosure of the pending, prior application is hereby incorporated by reference.

☐ 2. Submitted herewith is a copy of the complete prior application as filed.

☐ 3. This application is filed by fewer than all the inventors named in the prior nonprovisional application, 37 CFR 1.53(b)(1). **DELETE** the following inventor(s): _____.

☐ 4. Submitted herewith is a copy of the signed Oath/Declaration from the prior application.

☐ 5. Small entity status was established in the prior application, and is still proper and desired.

☐ 6. A _____ month Petition for Extension of Time is filed concurrently in the prior application.___

☒ 7. The amount of $1,720.00 for filing fee is being submitted herewith via the EFS payment system.

☒ 8. The prior application is assigned of record to: Japan Display Inc. and Panasonic Liquid Crystal Display Co., Ltd.

☒ 9. Priority is claimed from U.S. Application No. 14/709,529 filed on May 12, 2015 which claims priority from U.S. Application No. 13/600,349 filed on August 31, 2012, which claims priority from U.S. Application No. 12/379,363 filed on February 19, 2009, which claims priority from Japanese application JP2008-044247 filed on February 26, 2008, the content of which is hereby incorporated by reference into this application.

☒ 10. Other: Information Disclosure Statement with Form PTO-1449.

☒ 11. The Commissioner is hereby authorized to charge any additional fees associated with this communication, including patent application filing fees and processing fees under 37 C.F.R.§ 1.16 and 1.17, or credit any overpayment to **Deposit Account Number 60-0155**.

THE FILING FEE IS CALCULATED AS FOLLOWS:				BASIC FEE (FILING, EXAMINATION & SEARCH FEES):	$1,720.00
Total Claims:	8	-20 =	0	× $80 =	
Independent claims:	1	-3 =	0	× $420 =	

			Multiple Dependent Claim (Add $780.00):	
	Total Pages	38 (# × .75 – 100 = extra 50s =)	× 400	0.00
			Subtotal:	1,720.00
			Reduction if Small Entity Status:	0.00
			Total:	1,720.00

BACON & THOMAS PLLC
625 Slaters Lane, 4th Floor
Alexandria, Virginia 22314
Tel. No. 703-683-0500
Fax No. 703-683-1080

Please use Customer No. 38327

Date:	Name:	Signature:	Reg. No.
June 27, 2018	Juan Carlos A. Marquez	***/juan.carlos.a.marquez/***	34,072

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	HARU-0136
	Application Number	
Title of Invention	LIQUID CRYSTAL DISPLAY DEVICE	

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
	Takahiro		OCHIAI	

Residence Information (Select One) US Residency ● Non US Residency Active US Military Service

City	Country of Residence [i]
Chiba	JP

Mailing Address of Inventor:

Address 1	c/o Japan Display Inc.
Address 2	3-7-1, Nishi-Shinbashi, Minato-ku
City	Tokyo
State/Province	
Postal Code	105-003
Country [i]	JP

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Tohru		SASAKI	

Residence Information (Select One) US Residency ◉ Non US Residency Active US Military Service

City	Country of Residence [i]
Mobara	JP

Mailing Address of Inventor:

Address 1	c/o Japan Display Inc.
Address 2	3-7-1, Nishi-Shinbashi, Minato-ku
City	Tokyo
State/Province	
Postal Code	105-003
Country [i]	JP

Inventor 3 Remove

Legal Name

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	HARU-0136
	Application Number	
Title of Invention	LIQUID CRYSTAL DISPLAY DEVICE	

Prefix	Given Name	Middle Name	Family Name	Suffix
	Tetsuya		NAGATA	

Residence Information (Select One) US Residency ◉ Non US Residency Active US Military Service

City	Mobara	Country of Residence [i]	JP

Mailing Address of Inventor:

Address 1	c/o Japan Display Inc.		
Address 2	3-7-1, Nishi-Shinbashi, Minato-ku		
City	Tokyo	**State/Province**	
Postal Code	105-003	**Country** [i]	JP

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	38327		
Email Address	juancarlos@marqueziplaw.com	Add Email	Remove Email
Email Address	mail@marqueziplaw.com	Add Email	Remove Email
Email Address	lniu@marqueziplaw.com		Remove Email

Application Information:

Title of the Invention	LIQUID CRYSTAL DISPLAY DEVICE		
Attorney Docket Number	HARU-0136	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	6	**Suggested Figure for Publication (if any)**	

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	HARU-0136
	Application Number	
Title of Invention	LIQUID CRYSTAL DISPLAY DEVICE	

Filing By Reference:

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

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

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

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	38327		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	14709529	2015-05-12

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	HARU-0136
	Application Number	
Title of Invention	LIQUID CRYSTAL DISPLAY DEVICE	

Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	13600349	2012-08-31	9036104	2015-05-19
Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
	Continuation of	12379363	2009-02-19	8284339	2012-10-09

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. 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(i)(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)
2008-044247	JP	2008-02-26	

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.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

PTO/AIA/14 (11-15)
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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	HARU-0136
	Application Number	
Title of Invention	LIQUID CRYSTAL DISPLAY DEVICE	

Authorization or Opt-Out of Authorization to Permit Access:

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

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

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

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

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

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

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

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

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

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	HARU-0136
	Application Number	
Title of Invention	LIQUID CRYSTAL DISPLAY DEVICE	

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.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Japan Display Inc.		
Mailing Address Information For Applicant:			
Address 1	3-7-1, Nishi-Shinbashi, Minato-ku		
Address 2			
City	Tokyo	**State/Province**	
Country	JP	Postal Code	105-003
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. 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	HARU-0136
	Application Number	
Title of Invention	LIQUID CRYSTAL DISPLAY DEVICE	

Applicant 2 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

(●) Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Panasonic Liquid Crystal Display Co., Ltd.		
Mailing Address Information For Applicant:			
Address 1	1-6 Megahida-cho, Shikama-ku		
Address 2			
City	Himeji-shi, Hyogo-ken	**State/Province**	
Country	JP	Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

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

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

PTO/AIA/14 (11-15)
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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	HARU-0136
	Application Number	
Title of Invention	LIQUID CRYSTAL DISPLAY DEVICE	

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Remove

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/juan.carlos.a.marquez/			Date (YYYY-MM-DD)	2018-06-27
First Name	Juan Carlos	Last Name	Marquez	Registration Number	34072

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 CooperationTreaty.

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.

LIQUID CRYSTAL DISPLAY DEVICE

CROSS-REFERENCE TO RELATED APPLICATION

This application is a Continuation of U.S. Application No. 14/709,629 filed May 12, 2015, which is a Continuation of U.S. Application 13/600,349 filed August 31, 2012, which is a Continuation of U.S. Application No. 12/379,363 filed on February 19, 2009. The present application claims priority from U.S. Application 13/600,349 field on August 31, 2012, which claims priority from U.S. Application No. 12/379,363 filed on February 19, 2009, which claims priority from Japanese application JP2008-044247 filed on February 26, 2008, the content of which is hereby incorporated by reference into this application.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a liquid crystal display device, and in particular to a technique for ensuring an appropriate interval between a TFT substrate and an opposed substrate, using a column-type spacer.

2. Description of the Related Art

In a liquid crystal display device, liquid crystal is filled between a TFT substrate with a pixel electrode and a thin film transistor (TFT) formed thereon and an opposed substrate

with a color filter or the like formed thereon, and the liquid crystal particles are controlled by means of an electric field to thereby form an image. The interval between the TFT substrate and the opposed substrate is very small, such as of the order of a few microns. Conventionally, the interval between the TFT substrate and the opposed substrate is determined by dispersing plastic beads and the like. According to this interval setting by dispersing beads, however, the beads may not be dispersed consistently, and in such a case the interval between the TFT substrate and the opposed substrate may not be set as predetermined. In addition, the beads may be dispersed on a pixel electrode, which may cause a problem of light leakage in the vicinity of the beads.

Meanwhile, conventionally, in order to fill liquid crystal, the space between the TFT substrate and the opposed substrate is sealed to be vacant, and liquid crystal is injected into the space by utilizing atmospheric pressure. This method, however, takes time to complete injection of liquid crystal when the interval between the TFT substrate and the opposed substrate is small and the surface of the liquid crystal display is large. As a result, manufacturing throughput is reduced, and manufacturing cost resultantly increases. In order to address the above, there has been developed a technique, e.g., for applying, by dropping, the required amount of liquid crystal onto a TFT substrate and thereafter forming an opposed substrate to seal the liquid crystal in-between.

As described above, conventionally, the interval between

the TFT substrate and the opposed substrate is maintained by small beads dispersed therein. However, according to the above described liquid crystal dropping method, the dispersed beads may move as the liquid crystal is dropped, which results in an area with many beads and an area with only a few beads. This results in an inconsistent interval between the TFT substrate and the opposed substrate, and an inconsistent interval between the TFT substrate and the opposed substrate in turn results in a problem of reduced image contrast and/or inconsistent pixels in a liquid crystal display device.

In order to address the above described problem with a case in which the interval between a TFT substrate and an opposed substrate is set utilizing beads, there is available a technique for defining the interval between the TFT substrate and the opposed substrate by forming a column on either the TFT substrate or the opposed substrate, as disclosed in Japanese Patent Laid-open Publication No. Hei 11-84386.

The column for defining the interval between the TFT substrate and the opposed substrate is conventionally formed on the opposed substrate. Specifically, in formation of a column on the opposed substrate, the column is formed such that, after the opposed substrate and the TFT substrate are combined to each other, the column abuts on a predetermined position on the TFT substrate. However, should the opposed substrate and the TFT substrate be displaced from each other when being combined to each other, a column resultantly abuts outside the predetermined position on the TFT substrate. This may result in a column

formed on a pixel electrode or a column falling on a through-hole formed on a line of the TFT substrate. A column formed on a pixel electrode results in light leakage due to orientation disturbance in the portion where such a column is formed. A column falling on a through-hole results in an interval not appropriately defined between the TFT substrate and the opposed substrate.

Japanese Patent Laid-open Publication No. Hei 11-84386 discloses a structure in which a column is formed on either the opposed substrate or the TFT substrate in a position on a capacitance line in order to address orientation disturbance which would be caused in the vicinity of the column, and moreover, the capacitance line is laid extending in the rubbing direction of the alignment film. However, the capacitance line, which is essential in the above described structure disclosed in Japanese Patent Laid-open Publication No. Hei 11-84386, reduces transmittance of the liquid crystal display device. In particular, the capacitance line extending in the rubbing direction of the alignment film, as described in Japanese Patent Laid-open Publication No. Hei 11-84386, further reduces the transmittance.

SUMMARY OF THE INVENTION

An object of the present invention is to realize a liquid crystal display device having a structure in which the interval between the TFT substrate and the opposed substrate is defined

by a column and oriental disturbance and transmittance reduction due to formation of the column are suppressed.

In order to attain the above described object, according to one aspect of the present invention, a column for defining the interval between the TFT substrate and the opposed substrate is formed on the TFT substrate at a crossing point between a drain electrode and a scanning line. This column is formed at a crossing point between a scanning line and a drain line corresponding to a pixel of a specific color. Further, at a crossing point between a scanning line and a drain line corresponding to a pixel of a specific color, the width of the drain line is formed wider than that in other positions, while the width of the corresponding scanning line is formed narrower than that in other positions.

According to another aspect of the present invention, at a crossing point between a scanning line and a drain line corresponding to a pixel of a specific color, the width of the scanning line is formed wider than that in other positions, while the width of the corresponding drain line is formed narrower than that in other positions. Specifically, the following arrangement is employed.

(1) According to one aspect of the present invention, there is provided a liquid crystal display device having scanning lines extending in a lateral direction and aligned in a longitudinal direction, drain lines extending in the longitudinal direction and aligned in the lateral direction, a TFT substrate having pixels each having a TFT and a pixel electrode and formed in an

area enclosed by the drain line and the scanning line, the pixels constituting a first pixel, a second pixel, and a third pixel, respectively, depending on a color to which the respective pixel corresponds, and being aligned in the lateral direction, an opposed substrate placed with a predetermined interval with respect to the TFT substrate, and liquid crystal enclosed between the TFT substrate and the opposed substrate, wherein a column for defining the interval between the TFT substrate and the opposed substrate is formed at a crossing point between the drain line and the scanning line corresponding to the first pixel, and a width of the drain line is wider at the crossing point where the column is formed than that of the drain line in another position.

(2) In the above described liquid crystal display, at a point where the width of the drain line is wider, a width of the scanning line may be narrower than that of the scanning line in another position.

(3) In the above described liquid crystal display, a first TFT may be formed at the crossing point between the drain line and the scanning line, where the column is formed, a second TFT may be formed at a position adjacent to the crossing point between the drain line and the scanning line, where the column is formed, the first TFT and the second TFT may be electrically connected to each other, and a channel length of the first TFT may be shorter than that of the second TFT.

(4) In the above described liquid crystal display, a channel length of a TFT formed at a crossing point between the drain

line and the scanning line corresponding to the first pixel may be shorter than that of a TFT formed at a crossing point between the drain line and the scanning line corresponding to the second pixel or the third pixel.

(5) In the above described liquid crystal display, the liquid crystal display device may be of an IPS method.

(6) According to another aspect of the present invention, there is provided a liquid crystal display device having scanning lines extending in a lateral direction and aligned in a longitudinal direction, drain lines extending in the longitudinal direction and aligned in the lateral direction, a TFT substrate having pixels each having a TFT and a pixel electrode and formed in an area enclosed by the drain line and the scanning line, the pixels constituting a first pixel, a second pixel, and a third pixel, respectively, depending on a color to which the respective pixel corresponds, and being aligned in the lateral direction, an opposed substrate placed with a predetermined interval with respect to the TFT substrate, and liquid crystal enclosed between the TFT substrate and the opposed substrate, wherein a column for defining the interval between the TFT substrate and the opposed substrate is formed at a crossing point between the drain line and the scanning line corresponding to the first pixel, and a width of the scanning line is wider at the crossing point where the column is formed than that of the scanning line in another position.

(7) In the above described liquid crystal display device, at a point where the width of the scanning line is wider, a width

of the drain line may be narrower than that of the drain line in another position.

(8) In the above described liquid crystal display device, a first TFT may be formed at the crossing point between the drain line and the scanning line, where the column is formed, a second TFT may be formed at a position adjacent to the crossing point between the drain line and the scanning line, where the column is formed, the first TFT and the second TFT may be electrically connected to each other, and a channel length of the first TFT may be longer than that of the second TFT.

(9) In the above described liquid crystal display device, a channel length of a TFT formed at a crossing point between the drain line and the scanning line corresponding to the first pixel may be longer than that of a TFT formed at a crossing point between the drain line and the scanning line corresponding to the second pixel or the third pixel.

(10) In the above described liquid crystal display device, the liquid crystal display device may be of an IPS method.

According to the present invention, as a column for defining the interval between a TFT substrate and an opposed substrate is formed on the TFT substrate side at a crossing point between a scanning line and a drain line, problems due to formation of the column, including reduction of transmittance and light leakage due to orientation disturbance can be reduced. Further, as the width of the drain line is made wider in a position where the column is formed, the problem of light leakage due to orientation disturbance can be further suppressed. Still

further, as the width of the scanning line is made narrower in a position where the width of the drain line is wider, increase of parasitic capacitance can be suppressed.

According to the present invention, as the column is formed only at a crossing point between a drain line and a scanning line corresponding to a pixel of a specific color, difference in transmittance or characteristics of TFT's can be compensated for through initial setting, so that color inconsistency due to formation of a column can be prevented.

According to the present invention, as a column is formed at a crossing point between a drain line and a scanning line and the width of the scanning line is made wider in a position where the column is formed than that in other positions, light leakage due to orientation disturbance can be reduced. Further, as the width of the drain line is made narrower in a position where the width of the scanning line is wider, increase of parasitic capacitance can be suppressed.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a plan view of a TFT substrate according to a first embodiment;

Fig. 2 is a plan view of an opposed substrate according to the first embodiment;

Fig. 3 is a cross sectional view along the line III-III in Fig. 1;

Fig. 4 is a cross sectional view along the line IV-IV in

Fig. 1; Fig. 5 is a plan view of a TFT substrate according to a second embodiment; and

Fig. 6 is a cross sectional view along the line VI-VI in Fig. 5.

DETAILED DESCRIPTION OF THE INVENTION

In the following, embodiments of the present invention will be described in detail, based on a structure of an actual liquid crystal cell.

[First Embodiment]

Fig. 1 is a plan view showing a pixel portion of a TFT substrate to which the present invention is applied; Fig. 2 is a plan view showing an opposed substrate to be combined with the TFT substrate; Fig. 3 is a cross sectional view along the line III-III shown in Fig. 1; and Fig. 4 is a cross sectional view along the line IV-IV shown in Fig. 1.

In Fig. 1, scanning lines 105 extend in the lateral direction and are aligned in the longitudinal direction, and drain lines 107 extend in the longitudinal direction and are aligned in the lateral direction. An area enclosed by the scanning line 105 and the drain line 107 constitutes a pixel. In Fig. 1, a blue pixel B, a green pixel G, and a red pixel R are sequentially aligned in the lateral direction. A liquid crystal display device according to this embodiment is of a so-called IPS method, and adjusts the amount of light to pass through the liquid crystal by rotating the liquid crystal

particle 140 in a direction parallel to the substrate.

In Fig. 1, a comb-electrode which constitutes a pixel electrode 113 is provided inside a pixel enclosed by the scanning line 105 and the drain line 107, and a plane common electrode 111 (not shown) is provided under the comb-electrode with an insulating film in-between. The common electrode 111 is formed on the entire surface on the substrate except a contact hole formed on a line. In the IPS in this embodiment, the liquid crystal particle 140 is controlled by an electric line of force which is generated between the comb-electrode, or the pixel electrode 113, and the common electrode 111 formed on the entire surface of the substrate.

A constant voltage is supplied to the common electrode 111, while a video signal is supplied to the pixel electrode 113 via the drain line 107. The video signal is supplied by a TFT. In Fig. 1, the portion indicated by the dot line constitutes a semiconductor layer 103. The semiconductor layer 103 is formed using poly-Si. A gate line lies under the semiconductor layer 103 with a gate insulating film 104 in-between, so that the gate line functions as the gate electrode of the TFT. In Fig. 1, the semiconductor layer 103 is formed in an inverted-C shape, and the gate electrode lies under the semiconductor layer 103 at two points. As the semiconductor layer 103 above the gate electrode constitutes the channel of the TFT, resultantly, two TFT's are formed in series in each pixel in the structure shown in Fig. 1.

The semiconductor layer 103 is connected to the drain line 107 under the drain electrode via a first contact hole CH1. That

is, in this embodiment, the drain line 107 functions also as the drain electrode of the TFT. The other end of the semiconductor layer 103 is electrically-conductively connected to the pixel electrode 113 via a second contact hole CH2, a third contact hole CH3, and a fourth contact hole CH4. Therefore, a video signal from the drain line 107 is supplied to the pixel electrode 113 via the TFT.

This embodiment is characterized in that a column 130 for defining the interval between a TFT substrate 100 and an opposed substrate 200 is formed at a position where the scanning line 105 intersects the drain line 107. The plane shape of the column 130 is of an octagon long in the lateral direction, as shown in Fig. 1. In this embodiment, as the column 130 is formed on the TFT substrate 100, a problem due to displacement in position of the column 130 when combining the TFT substrate 100 and the opposed substrate 200 may be less serious, compared to a case in which the column 130 is formed on the opposed substrate 200.

In this embodiment, as the column 130 is formed at a crossing point between the scanning line 105 and the drain line 107, deterioration in transmittance can be suppressed. This is because the crossing point between the scanning line 105 and the drain line 107 originally does not pass light through, and is not utilized in image formation due to a TFT present in the vicinity of the crossing point.

However, as formation of the column 130 may disturb orientation of the liquid crystal in the vicinity of the column 130, in order to prevent this influence, in this embodiment, the

width of the drain line 107 is made wider in the vicinity of the crossing point with the scanning line 105. Specifically, in this embodiment, the width of the drain line 107 at the crossing point is double or larger the width of the drain line 107 in other positions. Even this arrangement exerts only little influence in terms of reduction of transmittance as the crossing point between the scanning line 105 and the drain line 107 originally does not contribute to image formation.

As the width of the drain line 107 is wider at the crossing point, the scanning line 105 overlaps the drain line 107 at the crossing point in an increased area. This means increase of parasitic capacitance, which brings, e.g., a phenomenon such as increase of a shift voltage or the like when the concerned TFT shifts from ON to OFF or vice versa. In this embodiment, in order to suppress increase of parasitic capacitance in the vicinity of the crossing point, the width of the scanning line 105 in the vicinity of the crossing point is made narrower.

In Fig. 1, a red pixel R, a blue pixel B, and a green pixel G are aligned in the lateral direction. As shown in Fig. 1, the column 130 is formed only at a crossing point between the scanning line 105 and the drain line 107 corresponding to the blue pixel B. In other words, the column 130 is formed at a crossing point where a TFT for controlling the blue pixel B is formed. As the width of the drain line 107 is wider in a position where the column 130 is formed, the transmittance in the position may be slightly reduced compared to that in a position without the column 130 and the characteristic of the concerned TFT may

become different from that of other TFT's.

Here, if the column 130 is formed spreading to pixels of three colors, control for color inconsistency or the like is difficult to be properly achieved. In this embodiment, however, as the column 130 is formed only at a crossing point corresponding to the blue pixel B, influence on color inconsistency due to formation of the column 130 is prevented. In this case, transmittance of the blue pixel B alone may become smaller than that of the pixels of other colors, and the characteristic of a TFT which controls the blue pixel B may become different from that of a pixel of another color. This, however, can be addressed through initial setting for compensation of the characteristic.

In Fig. 1, a crossing point between the scanning line 105 and the drain line 107 corresponding to the blue pixel B appears every three pixel pitch in the lateral direction, and the width of the drain line 107 is wider at all crossing points corresponding to the blue pixel B than that in other positions. Meanwhile, it is unnecessary to form a column 130 at all crossing points corresponding to the blue pixel B. This is because presence of only the number of columns 130 necessary to ensure the interval between the TFT substrate 100 and the opposed substrate 200 is sufficient. In this embodiment, irrespective of the presence or absence of the column 130, the width of the drain line 107 is made wider at all crossing points between the scanning line 105 and the drain line 107 corresponding to the blue pixels B to thereby maintain regularity to make it easier

to compensate for color inconsistency or the like through initial setting.

In Fig. 1, a semiconductor is formed in an inverted C shape, and a gate line lies under the semiconductor with the gate insulating film 104 in-between. A portion of the semiconductor which intersects the game line constitutes the channel portion of a TFT. Therefore, there are two TFT's in each pixel, namely, a TFT having a channel portion on the drain line 107 and a TFT having a channel in a portion away from the drain line 107.

In Fig. 1, the channel length of a TFT formed on the drain line 107 corresponding to the blue pixel B is shorter than that of a TFT formed on the drain line 107 corresponding to the red pixel R or green pixel G. Therefore, the characteristic of a TFT of the blue pixel B resultantly differs from that of TFT's of other pixels. As described above, an arrangement in which the characteristic of a TFT related to the blue pixel B alone differs from that of TFT related to other pixels makes it possible to compensate for the characteristic through initial setting.

Fig. 2 is a plan view of the opposed substrate 200 corresponding to the TFT substrate shown in Fig. 1, viewed from the TFT substrate side. In Fig. 2, "RCF" refers to a red filter; "BCF" refers to a blue filter; and "GCF" refers to a green filter. The respective filters corresponding to a red pixel R, a blue pixel B, and a green pixel G. The filter extends in stripe in the longitudinal direction of the screen. Therefore, pixels in the longitudinal direction on the opposed substrate 200 are not

discriminated from one another.

A light shielding film BM is formed between filters of respective colors. The light shielding film BM, which is formed on the opposed substrate 200 before forming the color filter, is indicated by the dot line in Fig. 2. The light shielding film BM absorbs external light to enhance contrast of an image. In Fig. 2, the column 130 formed on the TFT substrate 100 abuts on the light shielding film BM at the boundary between the red filter and the blue filter and on the color filter. As described above, with the column 130 abutting on the light shielding film BM on the opposed substrate 200, reduction in transmittance can be suppressed. The TFT substrate 100 shown in Fig. 1 and the opposed substrate 200 shown in Fig. 2 are combined to each other and liquid crystal is enclosed between the TFT substrate 100 and the opposed substrate 200, to thereby form a liquid crystal display panel. Fig. 3 is a cross sectional view of the TFT substrate 100 shown in Fig. 1 along the line III-III with the TFT substrate 100 and the opposed substrate 200 combined to each other. In Fig. 3, on the TFT substrate 100, a first base film 101 is formed using SiN, and a second base film 102 is formed thereon, using SiO_2. Both of the first base film 101 and the second base film 102 serve to prevent impurities from dispersing from the glass substrate into the TFT region.

In Fig. 3, a poly-Si layer is formed as the semiconductor layer 103 on the second base film 102. The poly-Si layer is formed by initially forming a-Si by means of CVD, and then transforming the a-Si into poly-Si by means of laser annealing.

A gate insulating film 104 is formed using SiO_2, covering the semiconductor layer 103.

A MoW film, which constitutes a gate line, is formed, coating the gate insulating film 104. Al alloy is used when reduction of resistance of the gate line is required. Either the game electrode or the scanning line 105 is patterned at a photo step. In this embodiment, the scanning line 105 also functions as the gate electrode, as shown in Fig. 1. The semiconductor layer 103 below the gate electrode constitutes the channel portion of a TFT. In Fig. 3, two gate electrodes are formed. Therefore, two TFT's are formed in Fig. 3.

A game electrode having a narrower width corresponds to a TFT formed on the drain line 107, shown in Fig. 1, and a gate electrode having a wider width corresponds to a TFT formed apart from the drain line 107. As shown in Fig. 3, in this embodiment, the channel length of a TFT formed on the drain line 107 is shorter than that of other TFT's. This is because the width of the scanning line 105 is narrower at a crossing point corresponding to the blue pixel B than that in other positions. In this embodiment, the width of the scanning line 105 at the crossing point is a half or narrower than that of the scanning line 105 in other positions.

An inter-layer insulating film 106 is formed using SiO_2, covering the gate electrode. The inter-layer insulating film 106 insulates the drain line 107 or source electrode 108 from the scanning line 105. Either the drain line 107 or the source line 108 is formed on the inter-layer insulating film 106. The

drain line 107 and the source electrode 108 are formed simultaneously in the same process. In this embodiment, the drain line 107 serves also as the drain electrode of the TFT.

A contact hole is formed on the inter-layer insulating film 106 and the gate insulating film 104 to connect the drain line 107 or the source line 108 and the semiconductor layer 103. In Fig. 3, the drain line 107 and the semiconductor layer 103 are connected through the first contact hole CH1, and the source electrode 108 and the semiconductor layer 103 are connected through the second contact hole CH2. An inorganic passivation film 109 is formed, using SiN, covering the drain line 107 and the source electrode 108 to protect the TFT.

An organic passivation film 110 is formed on the passivation film. The organic passivation film 110 covers a portion of the TFT, which cannot be covered due to a pin hole or the like formed in the inorganic passivation film 109 to protect the TFT, and also serves as a planarization film. Therefore, the organic passivation film 110 is formed as thick as 1 to 3 μm.

After formation of the organic passivation film 110, a third contact hole CH3 and a fourth contact hole CH4 hole for connecting the pixel electrode 113, to be formed later, and the source electrode 108 of the TFT are formed. The organic passivation film 110 is formed using a photosensitive resin, and can be patterned without use of photo-resist. Initially, the fourth contact hole CH4 is formed on the organic passivation film 110, and the third contact hole CH3 is thereafter formed on

the inorganic passivation film 109, using the organic passivation film 110 as a resist.

Thereafter, the common electrode 111 is formed, using ITO, or a transparent conductive film, on the planarized organic passivation film 110. The common electrode 111 is formed on the entire surface of the organic passivation film 110 by means of sputtering or the like, and remains plane except in the vicinity of the contact hole after the patterning.

A pixel insulating film 112 is formed using SiN, covering the common electrode 111. A contact hole for electrically-conductively connecting the source electrode 108 of the TFT and the pixel electrode 113 is formed on the pixel insulating film 112. Thereafter, the pixel electrode 113 is formed using ITO, or a transparent conductive film, on the pixel insulating film 112. The pixel electrode 113 is formed by spattering ITO onto the entire surface of the pixel insulating film 112, and then patterning the ITO into a comb-electrode, as shown in Fig. 1.

Fig. 3 shows a cross section of the comb-electrode. With a voltage applied to the pixel electrode 113, an electric line of force is generated between the pixel electrode 113 and the plane common electrode 111, as shown in Fig. 3, which causes the liquid crystal particle 140 to rotate, following the electric line of force. According to the IPS (In Plane Switching) method, transmission of light from the backlight is controlled by rotating the liquid crystal particle 140 to thereby form an image.

A column 130 is formed, using resin, on the pixel insulating film 112 in a position corresponding to a crossing

point between the scanning line 105 and the drain line 107. The column 130 is formed by coating the pixel insulating film 112 and the pixel electrode 113 with resign and then removing unnecessary resin at photo step. Acrylic resin is used as resin. The height of the column 130 corresponds to the interval between the TFT substrate 100 and the opposed substrate 200, being a few μm.

An alignment film 120 is formed using organic material, covering the pixel electrode 113 and the column 130. In order to align the liquid crystal particles with respect to the alignment film 120, rubbing is carried out. Rubbing is a process of rubbing the alignment film 120 in a constant direction, using cloth. However, presence of the column 130 may leave a portion around the column 130 only insufficiently rubbed. This leads to light leakage from the portion.

In this embodiment, however, as the column 130 is formed at a crossing point between the scanning line 105 and the drain line 107 and the drain line 107 has a wider width at the crossing point, reduction of contrast due to light leakage from an insufficiently rubbed portion, if any, around the column 130 is not caused.

In Fig. 3, the opposed substrate 200 is present on the upper side of the TFT substrate 100. A light shielding film BM is initially formed on the opposed substrate 200. The Light shielding film BM fills up the space between the color filters to thereby enhance image contrast. In this embodiment, a light shielding film BM is formed also on the opposed substrate 200 in

a position corresponding to where the column 130 is formed, so that light leakage around the column 130 is prevented by the light shielding film MB as well.

After formation of the light shielding film BM, color filters corresponding to the respective pixel colors are formed. In Fig. 3, a blue filter is formed. The surface resulted after formation of the color filter is convexo-concave, and therefore an overcoat film OC is formed on the color filter for planarization. Then, an alignment film 120 is formed, followed by rubbing to align the liquid crystal particles.

Fig. 3 shows a state in which the TFT substrate 100 and the opposed substrate 200, both formed as described above, are combined opposed to each other with the column 130 in-between, and liquid crystal is enclosed between the TFT substrate 100 and the opposed substrate 200. The interval between the TFT substrate 100 and the opposed substrate 200 is defined according to the height of the column 130.

Fig. 4 shows a cross section along the line IV-IV in Fig. 1, of the TFT substrate and the opposed substrate 200 combined to each other. Fig. 4 is a cross sectional view corresponding to the green pixel G. In Fig. 4, a structure of the TFT substrate 100 is similar to that described with reference to Fig. 3 except that the width of the gate electrode of a TFT formed at a crossing point between the scanning line 105 and the drain line 107 is identical to that of a TFT formed away from the crossing point in Fig. 4. This is because, in Fig. 4, the width of the scanning line 105 which constitutes the gate electrode is constant.

Therefore, the channel lengths of the two TFT's are identical and longer than that of a TFT formed at a crossing point where the column 130 is formed, shown in Fig. 3.

In Fig. 4, a structure of the opposed substrate 200 is identical to that which is described with reference to Fig. 3, except that the color filter is a green filter. In addition, no column 130 is formed in Fig. 4 because a column 130 is formed only at a crossing point between the scanning line 105 and the drain line 107 corresponding to the blue pixel B in this embodiment.

As described above, according to this embodiment, as the column 130 is formed at a crossing point between the scanning line 105 and the drain line 107, light leakage due to orientation disturbance can be prevented. Also, according to this embodiment, the drain line 107 with the column 130 formed thereon has a wider width at a crossing point with the scanning line 105 than that in other positions, risk of light leakage can be further reduced. Also, according to this embodiment, increase of capacitance between the gate and the drain can be reduced in an area where the width of the drain line 107 is wider, by reducing the width of the scanning line 105.

In this embodiment, as the column 130 is formed at a crossing point between the scanning line 105 and the drain line 107 corresponding to the same color, a problem of color inconsistency or the like can be avoided by compensating for a difference in light transmittance between a portion with the column 130 formed thereon and a portion without a column 130, a

difference in characteristic between transistors, and so forth through initial setting.

[Second Embodiment]

Fig. 5 is a plan view showing a second embodiment of the present invention; and Fig. 6 is a cross sectional view along the line VI-VI in Fig. 5. In Fig. 5, a structure in the second embodiment is similar to that of the first embodiment shown in Fig. 1 except a portion where the scanning line 105 intersects the drain line 107. In Fig. 5, the scanning lines 105 extend in the lateral direction and are aligned in the longitudinal direction, and the drain lines 107 extend in the longitudinal direction and are aligned in the lateral direction. A column 130 is formed at a crossing point between the scanning line 105 and the drain line 107, similar to the first embodiment.

In Fig. 5, a column 130 is formed at a crossing point between the scanning line 105 and the drain line 107 corresponding to the blue pixel B. In Fig. 5, in order to address light leakage due to insufficient rubbing around the column 130, the scanning line 105 is formed to have a wider width at the crossing point than that in other positions. Accordingly, in order to prevent increase of parasitic capacitance of the gate electrode and the drain electrode, the drain electrode is formed to have a narrower width than that in other positions.

The gate line has a wider width at a crossing point between the scanning line 105 and the drain line 107 corresponding to the blue pixel B, irrespective of the presence or absence of a column 130. Note that "a crossing point between the scanning

line 105 and the drain line 107 corresponding to the blue pixel B" refers to a crossing point where a TFT which controls the blue pixel B is formed.

Also in Fig. 5, two TFT's are formed at a crossing point between the scanning line 105 and the drain line 107 and in the vicinity thereof. In Fig. 5, because the width of the gate electrode is wider in a position where the column 130 is formed, that is, at a crossing point between the scanning line 105 and the drain line 107 corresponding to the blue pixel B, the channel length of a TFT formed therein is longer than that of the other TFT's. Meanwhile, the gate electrode widths of two TFT's at a crossing point between the scanning line 105 and the drain line 107 corresponding to a pixel of other colors and in the vicinity thereof are identical, and thus these TFT's have identical channel length.

A structure of the opposed substrate 200 corresponding to the TFT substrate 100 shown in Fig. 5 is identical to that shown in Fig. 2. That is, according to this embodiment, as the column 130 is formed at a crossing point between the scanning line 105 and the drain line 107, similar to the first embodiment, a structure of the opposed substrate 200 is identical to that in the first embodiment.

The TFT substrate 100 shown in Fig. 5 and an opposed substrate 200 similar to that which is shown in Fig. 2 are combined to each other, and liquid crystal is enclosed between the TFT substrate 100 and the opposed substrate 200, to thereby form a liquid crystal display panel. Fig. 6 is a cross sectional

view of the TFT substrate shown in Fig. 5 along the line VI-VI with the TFT substrate and the opposed substrate 200 combined to each other.

In Fig. 6, a process until formation of the gate insulating film 104 and coating of a MoW film to be a gate line is identical to that shown in Fig. 3 in the first embodiment. In Fig. 6, a MoW film, which constitutes either the gate electrode or the scanning line 105, is formed, coating the gate insulating film 104. Thereafter, either the scanning line 105 or the gate electrode is patterned at a photo step. Also in this embodiment, the scanning line 105 functions also as the gate electrode.

As shown in Fig. 5, as the scanning line 105, which constitutes the gate electrode, has a wider width at a crossing point between the scanning line 105 and the drain line 107, the gate electrode at the crossing point is longer in Fig. 6, and the channel length of the TFT is accordingly longer. That is, in Fig. 6, the channel length of a TFT formed at a crossing point between the scanning line 105 and the drain line 107 is longer than that of a TFT formed slightly away from the crossing point between the scanning line 105 and the drain line 107.

Thereafter, an inter-layer insulating film 106 is formed. Note that a process thereafter and a structure related to the thereafter process are identical to that which is described with reference to Fig. 3. An opposed substrate 200 is formed on the TFT substrate 100, with a structure of the opposed substrate 200 being identical to that which is described with reference to Fig. 3. As a wider scanning line 105 is formed under the column 130

in this embodiment, light leakage due to orientation disturbance, if occurs, in the vicinity of the column 130 is not caused.

In Fig. 5, no column 130 is formed at a crossing point between the scanning line 105 and the drain line 107 corresponding to a pixel other than the blue pixel B. The cross section along the line D-D' in Fig. 5 is a cross section of the TFT portion corresponding to the red pixel R. This cross sectional view is identical to that in Fig. 4, that is, the cross sectional view along the line IV-IV in Fig. 1 in the first embodiment, with description of the structure not repeated here. Through comparison between the TFT formed at a crossing point between the scanning line 105 and the drain line 107 corresponding to the red pixel R, shown in Fig. 4 and the TFT formed at a crossing point between the scanning line 105 and the drain line 107 corresponding to the blue pixel B, shown in Fig. 6, it is known that the channel length of the TFT related to the blue pixel B is longer.

Meanwhile, through comparison between the TFT formed at a crossing point between the scanning line 105 and the drain line 107 corresponding to the red pixel R, shown in Fig. 4, and the TFT formed at a crossing point between the scanning line 105 and the drain line 107 corresponding to the blue pixel B, shown in Fig. 3, it is known that the channel length of the TFT related to the blue pixel B is shorter. This is a significant difference between the first and second embodiments.

As described above, also in this embodiment, as the column 130 is formed at a crossing point between the scanning line 105

and the drain line 107, light leakage due to orientation disturbance can be avoided. Also, according to this embodiment, a portion of the scanning line 105 at a cross point with the drain line 107, where the column 130 is formed, has a wider width than that in other positions, risk of light leakage can be further reduced. Also, in this embodiment, increase of capacitance between the gate and the drain can be reduced in a portion where the scanning line 105 has a wider width by reducing the width of the drain line 107.

Also in this embodiment, as the column 130 is formed at a crossing point between the scanning line 105 and the drain line 107 corresponding to the same color, a problem of color inconsistency or the like can be avoided by compensating for a difference in light transmittance between a portion with the column 130 formed thereon and a portion without a column 130, a difference in characteristic between transistors, and so forth through initial setting.

Although it is described in the first and second embodiments that the column 130 is formed at a crossing point between the scanning line 105 and the drain line 107 corresponding to the blue pixel B, obviously, the present invention can be similarly applied when the column 130 is formed at a crossing point between the drain line 107 and the scanning line 105 corresponding to either one of the red pixel R or the blue pixel B. Also, although it is described in this embodiment that the IPS has a structure in which the upper comb-electrode is the pixel electrode 113 and the lower plane electrode is the

common electrode 111, the present invention can be similarly applied to a structure in which the upper column-electrode is the common electrode 111 and the lower plane electrode is the pixel electrode 113.

Further, although it is described in the above that the liquid crystal display device is of a so-called IPS method, application of the present invention is not limited to the IPS method but the present invention can be similarly applied to a so-called TN method, a VA method, and the like.

While there have been described what are at present considered to be certain embodiments of the invention, it will be understood that various modifications may be made thereto, and it is intended that the appended claims cover all such modifications as fall within the true spirit and scope of the invention.

What is Claimed is:

1. A liquid crystal display device comprising:

a first substrate;

a second substrate;

liquid crystal enclosed between the first substrate and the second substrate;

a scanning line formed between the first substrate and the liquid crystal;

a drain line crossing the scanning line;

a thin film transistor having a semiconductor layer and a source electrode,

a first insulation film above the semiconductor layer and having a first contact hole and a second contact hole, the semiconductor layer being connected to the drain line via the first contact hole and connected to the source electrode via the second contact hole;

an organic film above the source electrode;

a second insulation film;

a common electrode between the organic film and the second insulation film;

a first pixel electrode above the second insulation film and connected to the source electrode via a third contact hole formed in the second insulation film;

a second pixel electrode adjacent to the first pixel electrode; and

a spacer disposed between the first substrate and the second substrate,

wherein the scanning line has a first side and a second side opposite to the first side in the plan view, the first pixel electrode is located on the first side and the second pixel electrode is located on the second side,

wherein the semiconductor layer overlapped with the scanning line at a first channel region and a second channel region, and a part of the semiconductor layer between the first channel region and the second channel region is located on the second side of the scanning line,

wherein the spacer is overlapped with the semiconductor layer, the drain line, the organic film, and the common electrode,

wherein the first contact hole, the second contact hole, and the third contact hole are located on the first side of the scanning line, and

wherein the part of the semiconductor layer between the first channel region and the second channel region is overlapped with the second pixel electrode.

2. A liquid crystal display device according to claim 1,

wherein the scanning line is disposed between the semiconductor layer and the spacer in a cross-section view.

3. A liquid crystal display device according to claim 1, wherein the spacer is formed on the first substrate.

4. A liquid crystal display device according to claim 1,
wherein the second pixel electrode is overlapped with the scanning line.

5. A liquid crystal display device according to claim 4,
wherein the first pixel electrode is overlapped with the scanning line.

6. A liquid crystal display device according to claim 1,
wherein the organic film has a through hole, and the third contact hole is located in the through hole in the plan view.

7. A liquid crystal display device according to claim 6,
wherein the second insulation film contacts the source electrode.

8. A liquid crystal display device according to claim 1
wherein the spacer is provided on the second substrate and located away from the third contact hole.

ABSTRACT OF THE DISCLOSURE

A column for defining the interval between a TFT substrate and an opposed substrate is formed at a crossing point between a drain line and a scanning line. At the crossing point where the column is formed, the drain line is formed to have a wider width to prevent light leakage. Further, at the crossing point where the column is formed, the scanning line is formed to have a narrower width to prevent increase of capacitance between the drain line and the scanning line. The column is formed at a crossing point corresponding to a specific color, e.g., a blue pixel B, so that a difference in transmittance and in characteristic of thin film transistors due to formation of the column is initially compensated.

FIG.1

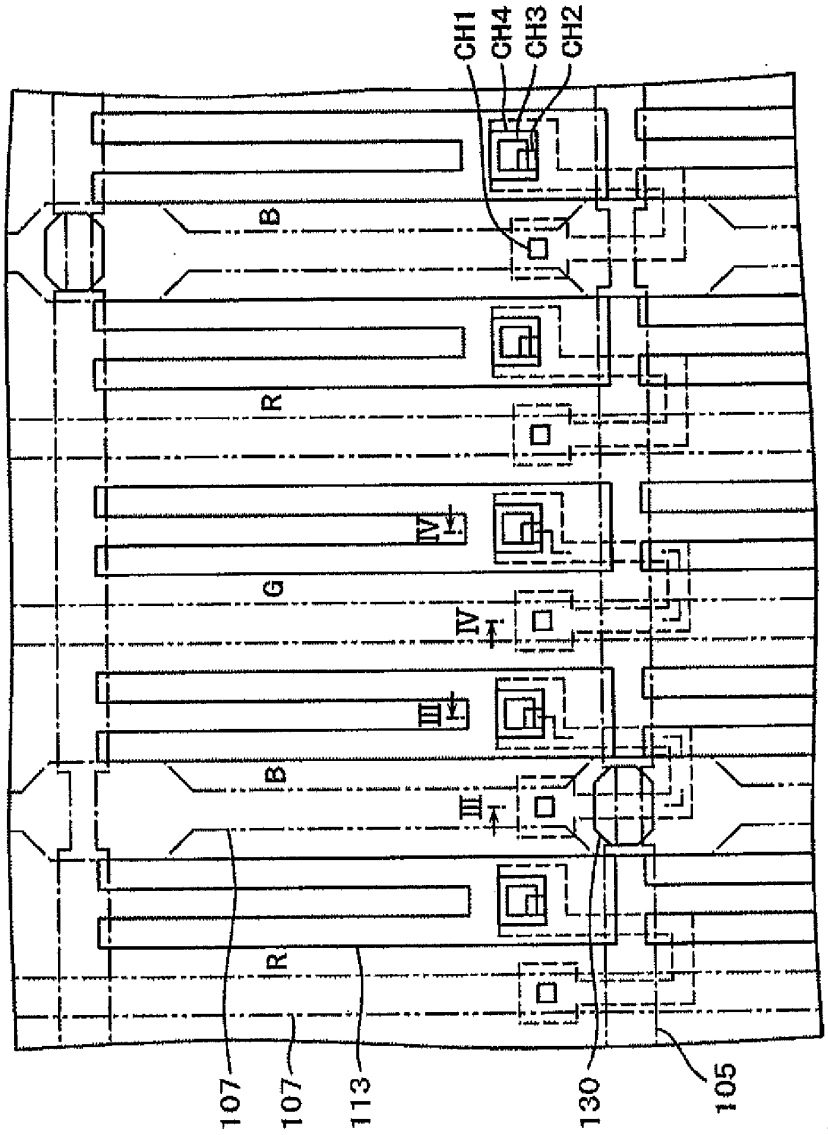

FIG.2

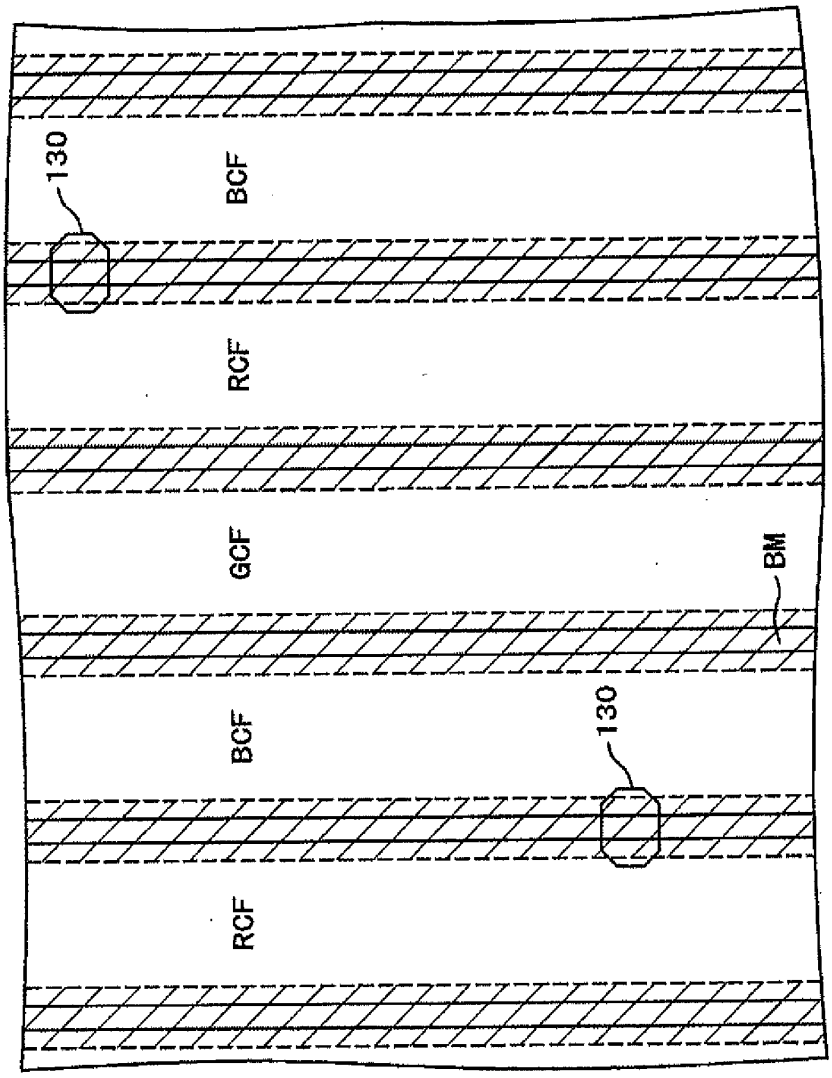

FIG.3

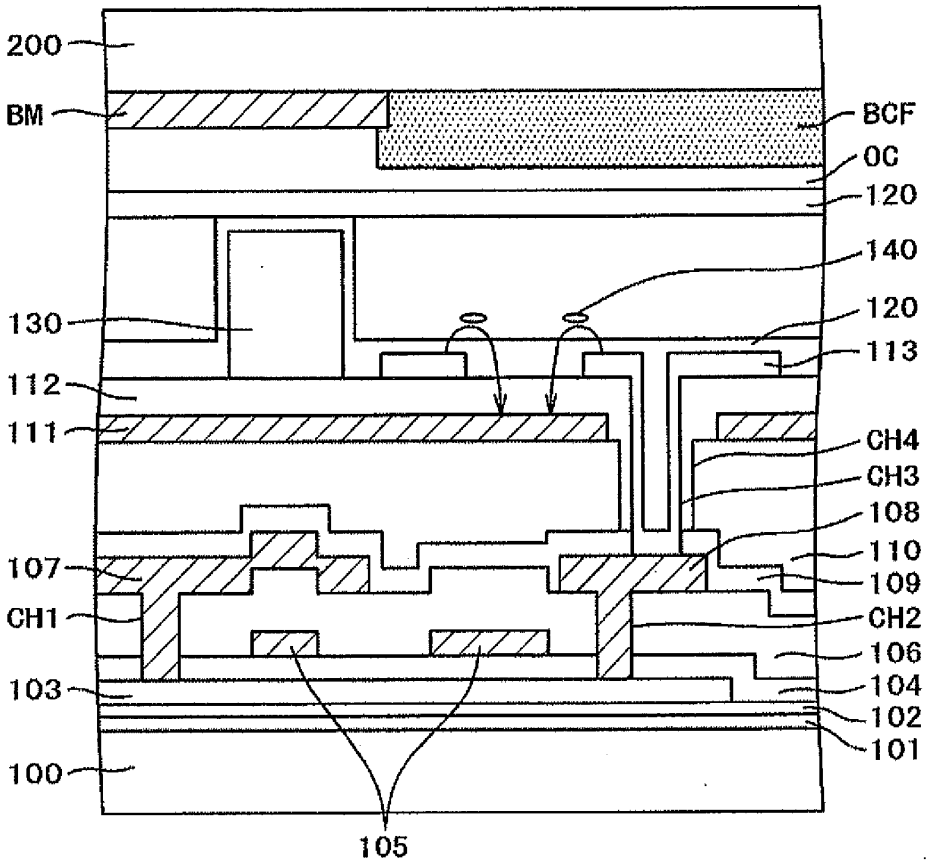
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FIG.4

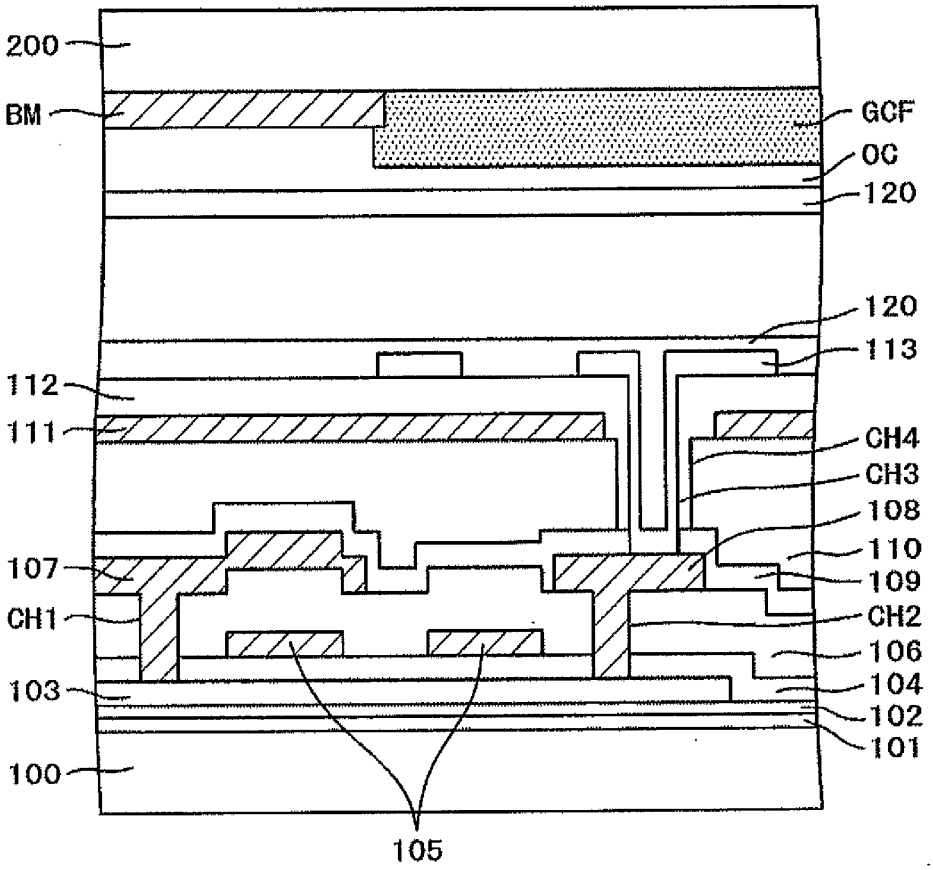
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FIG.5

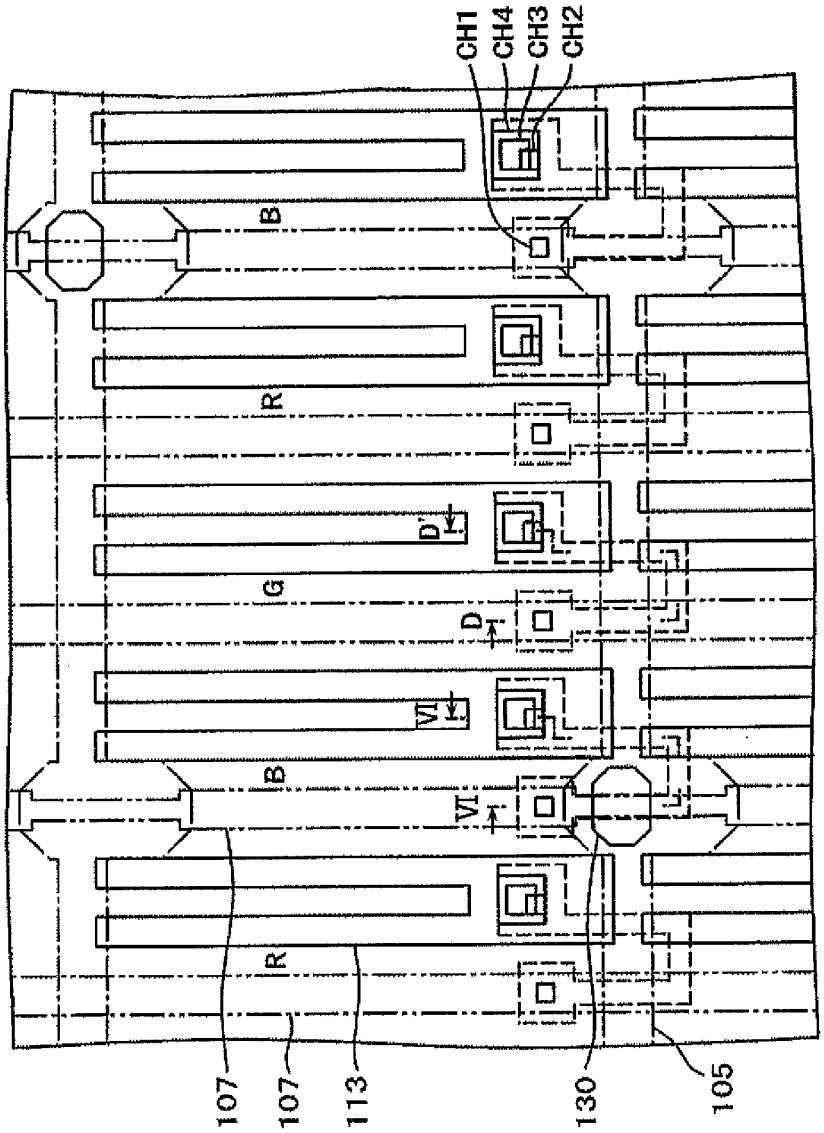
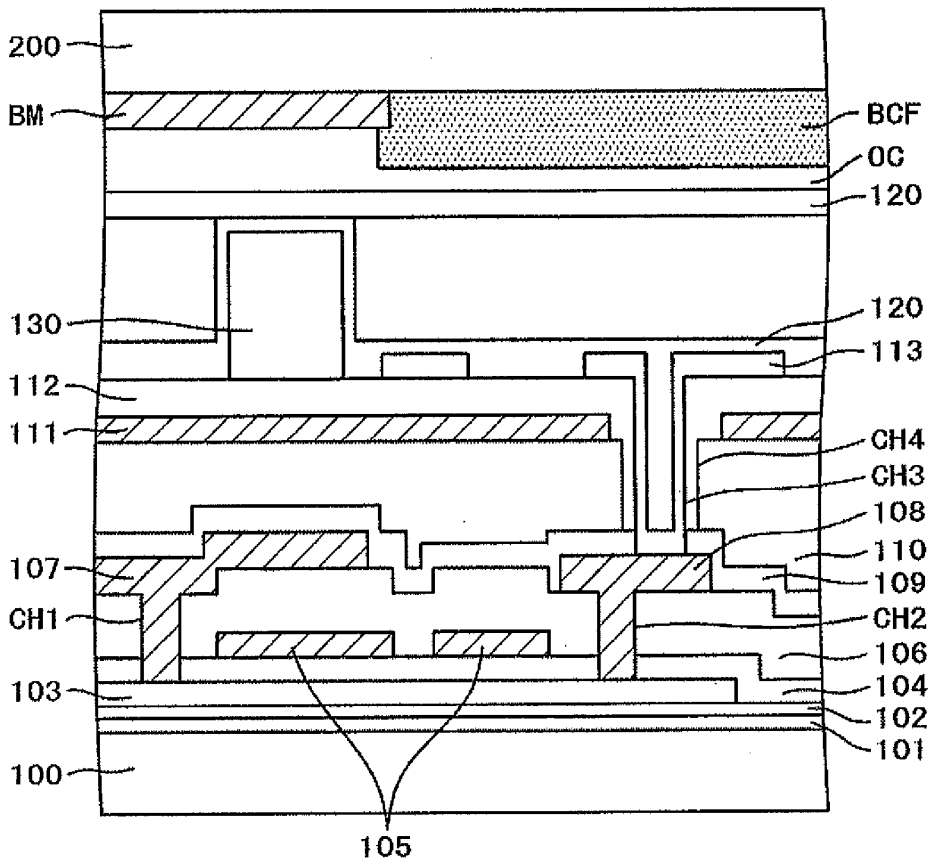


FIG.6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PTO/AIA/01 (06-12)
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	LIQUID CRYSTAL DISPLAY DEVICE

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 14/709,529 filed on May 12, 2015.

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.

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LEGAL NAME OF INVENTOR

Inventor: Takahiro OCHIAI Date (Optional) :

Signature: Takahiro Ochiai

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.

PTO/AIA/01 (06-12)
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LEGAL NAME OF INVENTOR

Inventor: Tohru SASAKI Date (Optional): July 23, 2015

Signature: Tohru Sasaki

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.

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LEGAL NAME OF INVENTOR

Inventor: Tetsuya NAGATA Date (Optional): _____

Signature: Tetsuya NAGATA

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.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	LIQUID CRYSTAL DISPLAY DEVICE
First Named Inventor/Applicant Name:	Takahiro OCHIAI
Filer:	Juan Carlos A. Marquez/Lily Niu
Attorney Docket Number:	HARU-0136

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	300	300
UTILITY SEARCH FEE	1111	1	660	660
UTILITY EXAMINATION FEE	1311	1	760	760
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1720**

Electronic Acknowledgement Receipt	
EFS ID:	33019949
Application Number:	16019937
International Application Number:	
Confirmation Number:	7509
Title of Invention:	LIQUID CRYSTAL DISPLAY DEVICE
First Named Inventor/Applicant Name:	Takahiro OCHIAI
Customer Number:	38327
Filer:	Juan Carlos A. Marquez/Lily Niu
Filer Authorized By:	Juan Carlos A. Marquez
Attorney Docket Number:	HARU-0136
Receipt Date:	27-JUN-2018
Filing Date:	
Time Stamp:	13:28:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1720
RAM confirmation Number	062718INTEFSW13303700
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	HARU-136-Continuation_transmittal.pdf	143129 7c3051bc2a1b0f748bf3c6d5d0878734e633975c	no	1
Warnings:					
Information:					
2	Application Data Sheet	HARU-136-ADS.pdf	1823550 d84a1d6611cfeaa42e69f0d1c0eebc8a7528fb05	no	9
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3	Specification	HARU-136-SPECIFICATION.pdf	113682 73365539fbbffaf0f7acf0f3cced5a1c07c410bb	no	28
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4	Claims	HARU-136-CLAIMS.pdf	65081 7043baf05eb09d6be153e7cfb8be35f6a3858d87	no	2
Warnings:					
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5	Abstract	HARU-136-Abstract.pdf	22427 c4b4355fbe81b1b26a7e4caf7cd9393b7fdde135	no	1
Warnings:					
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6	Drawings-only black and white line drawings	HARU-136-Drawings.pdf	148525 d84923df5d44708c014ede8d1c176acf665ec447	no	6
Warnings:					
Information:					

7	Oath or Declaration filed	HARU-136-Declarations.pdf	177876 36d4e0de61714b1538507256d330e6314d1c52ed	no	3
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8	Fee Worksheet (SB06)	fee-info.pdf	34758 bdb75b587ef81b62328e3ae0dd0dffb196e980a4	no	2
Warnings:					
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		Total Files Size (in bytes):	2529028		

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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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Doc Code: PA..
Document Description: Power of Attorney

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Application Number	16/019,937
Filing Date	June 27, 2018
First Named Inventor	Takahiro OCHIAI
Title	LIQUID CRYSTAL DISPLAY DEVICE
Art Unit	
Examiner Name	
Attorney Docket Number	HARU-0136

SIGNATURE of Applicant or Patent Practitioner

Signature	/juan.carlos.a.marquez/	Date (Optional)	06-27-2018
Name	Juan Carlos A. Marquez	Registration Number	34,072
Title (if Applicant is a juristic entity)	Attorney of Record		
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ *Total of _____ forms are submitted.

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Doc Code: PA..
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I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 38327

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature	/Kei Nakashima/	Date (Optional)	
Name	Kei NAKASHIMA		
Title	Group Manager, Japan Display Inc.		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of forms are submitted.

Customized PTO/AIA/80 (07-12)

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I hereby **appoint:**

The Practitioner(s) associated with the Customer Number: **38327**

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with the application identified in the attached statement under 37 CFR 3.73(c).

Please recognize or change the **correspondence address** for the application identified in the attached statement under 37 CFR 3.73(c) to:

The address associated with Customer Number: **38327**

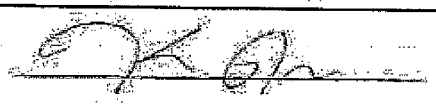
Assignee Name and Address:

Panasonic Liquid Crystal Display Co., Ltd.
1-6 Megahida-cho, Shikama-ku, Himeji-shi,
Hyogo, 672-8033 Japan

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

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

Signature  Date: Nov. 20, 2012

Name Kazuhiko Ishimaru

Title Manager of Intellectual Property Team

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TEL: 703-739-4900 • FAX: 703-739-9577 • CUSTOMER NO. 38327

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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Japan Display Inc. and Panasonic Liquid Crystal Display Co., Ltd.

Application No./Patent No.: 16/019,937 Filed/Issue Date: June 27, 2018

Titled: LIQUID CRYSTAL DISPLAY DEVICE

Japan Display Inc. and Panasonic Liquid Crystal Display Co., Ltd., a corporation

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

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

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

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

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

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

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

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

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

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

1. From: Takahiro OCHIAI, Tohru SASAKI and Tetsuya NAGATA To: Hitachi Displays, Ltd.

   The document was recorded in the United States Patent and Trademark Office at
   Reel 035619, Frame 0657, or for which a copy thereof is attached.

2. From: Hitachi Displays, Ltd. To: Hitachi Displays, Ltd. and IPS Alpha Support Co., Ltd.

   The document was recorded in the United States Patent and Trademark Office at
   Reel 035619, Frame 0774, or for which a copy thereof is attached.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

STATEMENT UNDER 37 CFR 3.73(c)

3. From: IPS Alpha Support Co., Ltd. To: Panasonic Liquid Crystal Display Co., Ltd.

The document was recorded in the United States Patent and Trademark Office at
Reel 035648, Frame 0561, or for which a copy thereof is attached.

4. From: Hitachi Displays, Ltd. To: Japan Display East, Inc.

The document was recorded in the United States Patent and Trademark Office at
Reel 035648, Frame 0561, or for which a copy thereof is attached.

5. From: Japan Display East, Inc. To: Japan Display Inc.

The document was recorded in the United States Patent and Trademark Office at
Reel 035648, Frame 05600912, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

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

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

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

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

/juan.carlos.a.marquez/	June 27, 2018
Signature	Date
Juan Carlos A. Marquez	34,072
Printed or Typed Name	Title or Registration 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.

Electronic Acknowledgement Receipt	
EFS ID:	33020710
Application Number:	16019937
International Application Number:	
Confirmation Number:	7509
Title of Invention:	LIQUID CRYSTAL DISPLAY DEVICE
First Named Inventor/Applicant Name:	Takahiro OCHIAI
Correspondence Address:	Juan Carlos A. Marquez Marquez Intellectual Property Law Office PLLC 1629 K Street, NW Suite 300 Washington DC 20006 US 202-349-1690 USPTO@dockettrak.com
Filer:	Juan Carlos A. Marquez/Lily Niu
Filer Authorized By:	Juan Carlos A. Marquez
Attorney Docket Number:	HARU-0136
Receipt Date:	27-JUN-2018
Filing Date:	
Time Stamp:	14:02:20
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	Power of Attorney	HARU-136-POA_transmittal.pdf	167985 9bc23fc9615fe0c4c8717c56c7699baa22299d41	no	1
Warnings:					
Information:					
2	Power of Attorney	HARU-136-POAs.pdf	122185 9ac5e202e29cb8a85fefcbb66dd29b9b3a396432	no	2
Warnings:					
Information:					
3	Assignee showing of ownership per 37 CFR 3.73	HARU-136-Assignee_statement.pdf	124396 fd1577604f1e21c249225ff7291203b5cbe41078	no	3
Warnings:					
Information:					
		Total Files Size (in bytes):	414566		

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/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16019937
Filing Date	2018-06-27
First Named Inventor	OCHIAI et al.
Art Unit	TBD
Examiner Name	TBD
Attorney Docket Number	HARU-0136

U.S.PATENTS Remove

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
	1	6762805	B2	2004-07-13	Ishino	
	2	6921917	B2	2005-07-26	Choi et al.	
	3	6999060	B2	2006-02-14	Choo	
	4	7285902	B2	2007-10-23	Koo et al.	
	5	7349038	B2	2008-03-25	Park et al.	
	6	7352429	B2	2008-04-01	Tseng et al.	
	7	7133108	B2	2006-11-07	Shimizu et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16019937
	Filing Date	2018-06-27
	First Named Inventor	OCHIAI et al.
	Art Unit	TBD
	Examiner Name	TBD
	Attorney Docket Number	HARU-0136

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20070002219	A1	2007-01-04	Lee et al.	
	2	20080185589	A1	2008-08-07	Shin et al.	
	3	20090284695	A1	2009-11-19	Kim et al.	
	4	20020044230	A1	2002-04-18	Yamazaki et al.	
	5	20070216627	A1	2007-09-20	Kim et al.	
	6	20080123007	A1	2008-05-29	Cui et al.	
	7	20040084673	A1	2004-05-06	Hirakata et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	JP 11-084386	JP		1999-03-26	Toshiba Corporation	Abstract	X

EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16019937
	Filing Date	2018-06-27
	First Named Inventor	OCHIAI et al.
	Art Unit	TBD
	Examiner Name	TBD
	Attorney Docket Number	HARU-0136

	2							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

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		

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	16019937
	Filing Date	2018-06-27
	First Named Inventor	OCHIAI et al.
	Art Unit	TBD
	Examiner Name	TBD
	Attorney Docket Number	HARU-0136

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.

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

None

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	/juan.carlos.a.marquez/	Date (YYYY-MM-DD)	2018-06-27
Name/Print	Juan Carlos A. Marquez	Registration Number	34072

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.**

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.

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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.

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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:	33021653
Application Number:	16019937
International Application Number:	
Confirmation Number:	7509
Title of Invention:	LIQUID CRYSTAL DISPLAY DEVICE
First Named Inventor/Applicant Name:	Takahiro OCHIAI
Customer Number:	38327
Filer:	Juan Carlos A. Marquez/Lily Niu
Filer Authorized By:	Juan Carlos A. Marquez
Attorney Docket Number:	HARU-0136
Receipt Date:	27-JUN-2018
Filing Date:	
Time Stamp:	14:38:17
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	HARU-136-Continuation_IDS.pdf	126605 6a6ae4136c610d97d528f83c5feaa6b7e1a13bed	no	3
Warnings:					

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	HARU-136-IDS_SB08.pdf	612693 05442d76f7ce4f8c01242e921b90fa0fc9541842	no	5
Warnings:					
Information:					
			Total Files Size (in bytes):	739298	

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. Patent Application of	)	**Confirmation No. 7509**
	)	
OCHIAI et al.	)	
	)	
Application Number: 16/019,937	)	
	)	
Filed: June 27, 2018	)	
	)	
For: LIQUID CRYSTAL DISPLAY DEVICE	)	
	)	
Attorney Docket No. HARU-0136	)	

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

INFORMATION DISCLOSURE STATEMENT

Sir:

The above-referenced application is a Continuation of U.S. Application No. 14/709,529, filed May 12, 2015, which is a Continuation of U.S. Application 13/600,349 filed August 31, 2012, which is a Continuation of U.S. Application No. 12/379,363 filed on February 19, 2009.

Pursuant to 37 C.F.R. §§ 1.56 and 1.97, this Information Disclosure Statement is being submitted in connection with the above-identified patent application. A listing of documents to be published on the face of any patent granted from this application is submitted herewith on the accompanying Form PTO-1449. Any other documents or information submitted for consideration by the Examiner are listed in this paper. A copy of each non-US or foreign patent or non-patent publication or any portion thereof listed or herein identified is submitted herewith.

CERTIFICATION

1. This Information Disclosure Statement is being submitted:

[X] (a) Concurrently with the above captioned U.S. Continuation application, whereby it is believed that no fee is due; OR

[ ] (b) After three months from the filing date of the above-identified U.S. patent application but before the mailing date of the first Office Action on the merits of the above-identified application, whereby it is believed that no fee is due; OR

[ ] (c) After three months from the filing date of the above-identified U.S. patent application and after the mailing date of the first Office Action on the merits of the above-identified application, but prior to the issuance of any Final Action or Notice of Allowance sent in such application, whereby Applicant(s) hereby submit the requisite certification hereinbelow, or authorization for the payment of the requisite fee is attached; OR

[ ] (d) After the issuance of a Final Action or Notice of Allowance, but before the payment of the Issue Fee, whereby Applicant(s) hereby submit the requisite certification hereinbelow, and the attached authorization for the payment of the requisite fee.

2. In accordance with the requirements of 37 C.F.R. §1.97, and Parts 1(c) or 1(d) above, Applicant(s) hereby certify that:

[ ] Each item of information contained in this 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 this Information Disclosure Statement; OR

[ ] No item of information contained in this 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 §1.56(c) more than three months prior to the filing of this Information Disclosure Statement.

Please charge any additional fees or credit any overpayments in connection with the submission of this Information Disclosure Statement to Deposit Account No 60-0155.

The Examiner is requested to acknowledge receipt and consideration of the information provided in this paper in accordance with prescribed procedures.

Respectfully submitted,

/juan.carlos.a.marquez/

Juan Carlos A. Marquez
Registration Number 34,072

MARQUEZ IP LAW OFFICE, PLLC
1629 K Street, NW, Suite 300
Washington, DC 20006
Phone: (202) 349-1690
Fax: (202) 754-9829
Customer No. 38327

June 27, 2018